



ASNR

AMERICAN SOCIETY OF  
NEUROREHABILITATION



2024 ANNUAL  
MEETING

APRIL 11-13, 2024  
SAN ANTONIO, TEXAS

# WELCOME TO THE 2024 ASNR ANNUAL MEETING

We are so excited to welcome you to the 2024 Annual Meeting of the American Society of Neurorehabilitation (ASNR)! Going to the ASNR meeting is truly one of my favorite times of year. During this event each year, interdisciplinary speakers, presenters, and members come together to discuss a broad range of topics that really allows us to promote 'neurorecovery through discovery'. I encourage you to talk and network with the breadth of attendees at the conference, including clinicians, trainees, scientists, therapists, engineers, industry representatives, editors, and funding agency representatives.

We hope you will enjoy our meeting program this year. The program features cutting-edge research in several neurological diseases, from stroke to spinal cord injury to multiple sclerosis and more. Professional development sessions will complement the scientific program and allow attendees to practice and discuss how to grow professionally, while also learning how to implement techniques to improve their research endeavors. Join us for lunch on Thursday and Friday and take advantage of the opportunity to speak to our exhibitors. Each full day of the conference ends with a poster session. If you don't have enough time to make it to all the posters in one session, do not worry! Posters will remain up for the entire Annual Meeting, allowing attendees to view posters for the duration of the conference.

I invite you to join us for the ASNR Business Meeting on Friday to learn about ASNR and ask any questions you may have to the ASNR leadership. We will be easy to identify — we will all be wearing red "Ask Me" buttons. We also hope you will join us for our diversity, equity, & inclusion efforts throughout the conference. This will include a keynote speaker on Saturday and an offsite event. The offsite event will be a tour of the Historic Alamo. This is a wonderful opportunity to experience the history of South Texas and reminder of the most sacred battle in Texas history.

We are so happy you could join us for ASNR 2024. On behalf of ASNR and the Program Committee, welcome to San Antonio and South Texas. We look forward to seeing you again in Atlanta in 2025!

Kelsey Potter-Baker, PhD  
ASNR Program Chair

## MISSION

To improve the lives of people with neurological disorders through advances in basic and clinical research.

**VISION** - Neurorecovery through discovery

## 2024 PROGRAM COMMITTEE

Jason Carmel, MD, PhD (past chair)  
Ahmet Arac, MD  
Lauri Bishop, PT, DPT, PhD  
Steve Cramer, MD, MMSc  
Naveed Ejaz, PhD  
Kathleen Friel, PhD

Nicole Haikalis  
Kate Hayward, PhD  
Sangeetha Madhavan, PT, PhD  
Natalia Sanchez, PhD  
Heidi Schambra, MD  
Rick Segal, PT, PhD, FAPTA

Charlotte Stagg, MRCP, DPhil  
Jill Stewart, PT, PhD

# GENERAL MEETING INFORMATION

## ANNUAL MEETING EVALUATION

Please complete the Annual Meeting survey throughout or following the meeting. The meeting evaluation can be found by scanning the QR code on the bottom of this page, or on any meeting signage. Your responses are crucial to the future success of ASNR. Thank you!

## REGISTRATION HOURS

Wednesday, April 10.....	4:00 pm – 6:00 pm
Thursday, April 11.....	7:00 am – 6:00 pm
Friday, April 12.....	7:00 am – 6:00 pm
Saturday, April 13.....	7:00 am – 1:00 pm

## FOOD & BEVERAGE INCLUDED

Thursday, April 11 | AM Beverages | 8:00 - 10:00am | Salon del Rey Foyer  
Thursday, April 11 | Lunch | 12:00 - 1:30pm | El Mirador  
Thursday, April 11 | PM Beverages | 3:45 - 5:00pm | La Vista Foyer  
Thursday, April 11 | Appetizers & Drinks | 6:00 - 8:00pm | Salon del Rey

Friday, April 12 | AM Beverages | 8:00 - 10:30pm | La Vista Foyer  
Friday, April 12 | Lunch | 12:15 - 1:45pm | El Mirador  
Friday, April 12 | PM Beverages | 3:15 - 5:00pm | La Vista Foyer  
Friday, April 12 | Appetizers & Drinks | 6:00 - 8:00pm | Salon del Rey

Saturday, April 13 | AM Beverages | 8:00 - 11:30am | La Vista Foyer

## POSTER & EXHIBIT HALL HOURS

The Poster & Exhibit Hall, located in Salon del Rey on the 2nd floor, will be open to visit throughout the conference. Scheduled exhibitor hours will be:

Thursday, April 11.....	6:00 – 8:00pm (during Poster Reception I)
Friday, April 12.....	12:30 – 1:30pm
Friday, April 12.....	6:00 – 8:00pm (during Poster Reception II)

ASNR2024 Evaluation:



@ASNRRehabilitation



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@asnrehab.bsky.social

**#ASNR2024**



# 2024 ANNUAL MEETING AGENDA

## THURSDAY, APRIL 11

- 8:30AM - 12:00PM Professional Development Roundtables | Salon del Rey (2nd Floor)**  
NIH Grants - How It All Works | *Theresa Cruz, PT, PhD & Stephanie Nagle Emmens, PhD*  
Reviewing Your First Grant | *Trisha Kesar, PT, PhD & Kristan Leech, PT, DPT, PhD*  
Dos and Don'ts of Manuscript Reviewing | *Mindy Levin, PT, PhD & Randy Nudo, PhD, FASNR*  
Reproducible Rehabilitation Research: Data Science, Data Sharing, and Open Science | *Sook Lei-Liew, PhD, OTR/L, James Finley, PhD & Andrew Hooyman, PhD*  
#CareerGoals: Leveraging Social Media to Advance Your Career | *Marie McNeely, PhD, Jyutika Mehta, PhD & Michelle Ploughman, PT, PhD*  
"White Matter" - Make New Connections! | *Heidi Schambra, MD, FASNR & David Cunningham, PhD*
- 12:00 - 1:30PM Lunch | El Mirador Room (22nd Floor)**
- 1:30 - 3:00PM Symposium 1 - Windows of Opportunity in MS: Recovery, Plasticity, Deconditioning, Does It Even Matter? | La Vista Room (22nd Floor)**  
*Speakers: Sarah Donkers, PT, PhD, V. Wee Yong, PhD, & Michelle Ploughman, PT, PhD*
- 3:00 - 4:00PM Oral Abstract Session | La Vista Room (22nd Floor)**
- 4:00 - 4:30PM Beverage Break**
- 4:30 - 6:00PM Symposium 2 - Tactile Assessments & Treatments for Upper Extremity Movement Recovery in Individuals with Stroke | La Vista Room (22nd Floor)**  
*Speakers: Netta Gurari, PhD, Kevin Parcetch, DPT, Na Jin Seo, PhD, & Jeff Min-In You, PhD*
- 6:00 - 8:00PM Poster Reception 1 | Salon del Rey (2nd Floor)**

## FRIDAY, APRIL 12

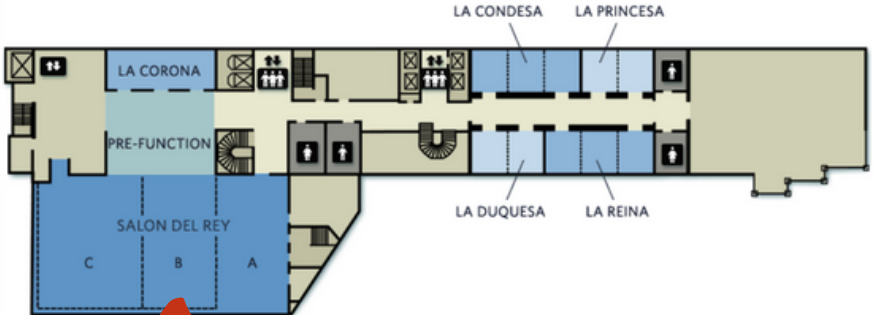
- 8:30 - 10:00AM Symposium 3 - Markerless Motion Capture: Increasing Diversity & Inclusivity of 3D Motion Assessment | La Vista Room (22nd Floor)**  
*Speakers: Elizabeth Conalliffe, MD, PhD, Amanda Rande, BSc, Martin Ferguson-Pell, PhD, & Carolyn Patten, PT, PhD*
- 10:00 - 10:15AM Break**
- 10:15 - 11:45AM Professional Development Session A - Applications of Emerging Computer Vision Technologies in Neurorehabilitation | La Vista Room (22nd Floor)**  
*Speakers: Ryan Roemlich, PhD, R. James Cotton, MD, PhD & Rachel Hawe, PT, DPT, PhD*
- 11:45AM - 12:15PM Award Recognitions | La Vista Room (22nd Floor)**
- 12:15 - 1:45PM Lunch & Visit Exhibitors | Lunch: El Mirador Room (22nd Floor), Exhibitors: Salon del Rey (2nd Floor)**
- 1:45 - 3:15 PM Symposium 4 - Reticulospinal Contributions to Movement after Stroke and Spinal Cord Injury: Impact on Rehabilitation | La Vista Room (22nd Floor)**  
*Speakers: Monica Perez, PT, PhD, Stuart Baker, PhD & Jules Dewald, PT, PhD*
- 3:15 - 3:30PM Beverage Break**
- 3:30 - 5:00 PM Professional Development Session B - How to Integrate Qualitative Methods Into Your Neurorehabilitation Research | La Vista Room (22nd Floor)**  
*Speakers: Marika Demers, PhD, Amelia Cain, PT, DPT, Julie Schwertfeger, PT, PhD, Jessica Cassidy, PT, DPT, PhD*
- 5:00 - 5:15PM Break**
- 5:15 - 6:00PM ASNR Business Meeting | La Vista Room (22nd Floor)**
- 6:00 - 8:00PM Poster Reception 2 | Salon del Rey (2nd Floor)**

## SATURDAY, APRIL 13

- 8:30 - 10:00AM Symposium 5 - Frontiers in Neuro Regenerative Rehabilitation | La Vista Room (22nd Floor)**  
*Speakers: Hiroataka Iijima, PhD, PT, Kai Wang, PhD, Michael Modo, PhD & Sean Savitz, MD*
- 10:00 - 11:00AM DEI Session - Is Representativeness an Alternative to DEI in Clinical Research? | La Vista Room**  
*Speaker: Gladys Maestre, MD, PhD*
- 11:00 - 11:15AM Beverage Break**
- 11:15AM - 12:45PM Symposium 6 - Neural Reorganization: Fact or Fiction? | La Vista Room (22nd Floor)**  
*Speakers: Kelsey Baker, PhD, Trisha Kesar, PT, PhD, Seth Hays & Dmitry Sayenko, MD, PhD*
- 2:30 - 3:30PM Off-Site DEI Excursion - The Alamo Audio Tour (sign-up required)**

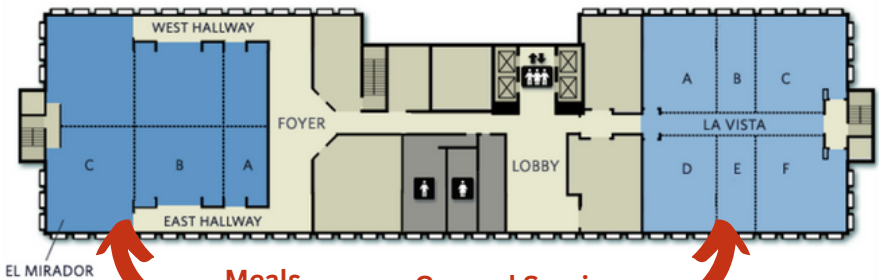
# HILTON PALACIO DEL RIO LAYOUT

## MEZZANINE LEVEL (2ND FLOOR)



**Roundtables,  
Poster & Exhibit Hall**

## CONFERENCE LEVEL (22ND FLOOR)



**Meals**

**General Session**



### LEGEND

 ELEVATOR  SERVICE ELEVATOR  RESTROOMS

# THURSDAY PROGRAM DETAILS

## PROFESSIONAL DEVELOPMENT ROUNDTABLES

Thursday, April 11, 2024 • 8:30 am – 12:00 pm • Salon del Rey (2nd Floor)

**\*\*\* Each topic will feature 2 tables \*\*\***

### Topic A: NIH Grants - How It All Works



Theresa Cruz, PhD



Stephanie Nagle  
Emmens, PhD

### Topic B: Reviewing Your First Grant



Trisha Kesar, PT, PhD



Kristan Leech, PT,  
DPT, PhD

### Topic C: Dos and Don'ts of Manuscript Reviewing



Mindy Levin, PT,  
PhD



Randy Nudo, PhD,  
FASNR

### Topic D: Reproducible Rehabilitation Research: Data Science, Data Sharing, and Open Science



Sook-Lei Liew,  
PhD, OTR/L



James Finley,  
PhD



Andrew Hooyman,  
PhD

### Topic E: #CareerGoals: Leveraging Social Media to Advance Your Career



Marie McNeely,  
PhD



Jyutika Mehta,  
PhD



Michelle  
Ploughman, PhD

### Topic F: "White Matter" Table - Make New Connections!



Heidi Schambra,  
MD, FASNR



David Cunningham,  
PhD

# THURSDAY PROGRAM DETAILS

## Windows of Opportunity in MS: Recovery, Plasticity, Deconditioning, Does it Even Matter?

Thursday, April 11, 2024 • 1:30 pm – 3:00 pm • La Vista

Course Director: Sarah Donkers, PT, PhD

### DESCRIPTION:

Our understanding of the pathophysiology of multiple sclerosis (MS) has advanced with newer high efficacy disease-modifying-therapies (DMT) wiping out autoimmune attacks and inflammatory responses. Relapses have gone from 3-5 every 1-3 years to 1 every 7-10 years! However, people with MS are still progressively losing functional abilities and experience debilitating symptoms negatively affecting quality of life. Two major pathophysiological mechanisms drive the accumulation of MS-related disability: inflammation and neurodegeneration. Currently approved DMTs mainly address the inflammatory component of the disease but largely fail to halt progressive neuronal loss. Therefore, counteracting neurodegenerative processes and promoting neuronal repair/neuroplasticity remain the most relevant unmet clinical needs. Rehabilitation targeted towards halting decline and restoring function have the potential to slow progression and enhance quality of life. Access to rehabilitation care tends to still be primarily considered later in the disease course with a compensatory approach. Based on our research (both in animal and humans with MS), improvements can be seen across the MS disease course, but windows of opportunity may be critical in targeting optimal response. Early post-diagnosis may have a neuroprotective affect and build brain capacity and reserve. Moderate functional impairment from MS is another critical time to intensify both fitness and functional abilities optimizing neuroplasticity. The effects of maintaining fitness in the moderate-severe stages of MS could also delay progression. This symposium will cover the current literature and discuss clinical application. MS repair, neuroplasticity, deconditioning – has the role of rehab in MS changed, with relapses now 1 every 7 years yet we still see progressive loss of function and accumulation of new impairments...what windows of opportunity and interventions are we missing?

### SPEAKERS:



*Sarah Donkers,  
PT, PhD*



*V. Wee Yong, PhD*



*Michelle Ploughman,  
PT, PhD*

### SCHEDULE:

1:30 – 1:40pm: **Welcome & Terminology** – Sarah Donkers, PT, PhD

1:40 – 2:00pm: **Overview of Neurorecovery Interventions From Animal Models of MS** – V. Wee Yong, PhD

2:00 – 2:20pm: **Studying Interventions Promoting Neurorecovery in Humans With MS** – Michelle Ploughman, PT, PhD

2:20 – 2:40pm: **Windows of Opportunity and Clinical Application** - Sarah Donkers, PT, PhD

2:40 – 3:00pm: **Discussion** - ALL

# ORAL ABSTRACT PRESENTATIONS

Thursday, April 11, 2024 • 3:00 pm – 4:00 pm • La Vista

## **P. 108 Exploring Machine Learning Approaches for Predicting Parkinsonian Gait: A Focus on Synthetic Minority Over-sampling Technique (SMOTE)**

**Authors:** Daniel Salinas, Gerardo Medellín, Katherine Bolado, Tomas Gomez, Dr. Nawaz Khan Abdul Hack, Dr. Ramu Vadukapuram, Dr. Igor Zwir, Dr. Kelsey Baker

**Presented by:** Daniel Salinas, University of Texas Rio Grande Valley

## **P. 56 White matter disconnection predicts visually guided reaching performance in chronic stroke**

**Authors:** Matthew Chilvers, Trevor Low, Sean Dukelow

**Presented by:** Matthew Chilvers, University of Calgary

## **P. 118 Estimating the effect of age on one-year change in individual motor skill among a large, remote online cohort**

**Authors:** Andrew Hooyman, Sydney Schaefer

**Presented by:** Andrew Hooyman, Arizona State University

## **P. 119 Associations between neuroimaging predictors and changes in arm impairment in a phase 3 stroke recovery trial of vagus nerve stimulation.**

**Authors:** Anne Schwarz, Marc Feldman, Vu Le, Jesse Dawson, Charles Y Liu, Gerard E Francisco, Steven L Wolf, Anand Dixit, Jen Alexander, Rushna Ali, Benjamin L Brown, Wuwei Feng, Louis DeMark, Leigh R Hochberg, Steven A Kautz, Arshad Majid, Michael W O'Dell, Jessica Redgrave, Duncan L Turner, Teresa J Kimberley, Steven C. Cramer

**Presented by:** Anne Schwarz, Department of Neurology, David Geffen School of Medicine at UCLA, Los Angeles, USA; California Rehabilitation Institute, Los Angeles, USA.

## **P. 3 Correlation between walking function and transcranial magnetic stimulation derived measures in spinal cord injury**

**Authors:** Avery Foreman, Elliot Frost, Faith Meza, Chad Swank, Hui-Ting Goh

**Presented by:** Hui-Ting Goh, Texas Woman's University

## **P. 16 Bimanual and Unimanual Rehabilitative Training After Stroke: Patterns of Activity-Dependent Structural Plasticity in Peri-lesion and Contra-lesion Cortices**

**Authors:** Victoria Nemchek, Celeste J. Hoang, Vinuthna Mallampaty, Morgan McCrear, Nikita Potdar, Vennila Sathesh, Deekshita Sundararaman, Theresa A. Jones

**Presented by:** Victoria Nemchek, The University of Texas at Austin

## **PRESENTERS:**



Daniel Salinas,  
MS



Matthew  
Chilvers, PhD



Andrew  
Hooyman, PhD,  
Gstat



Anne Schwarz,  
PT, PhD



Hui-Ting Goh,  
PT, PhD



Victoria  
Nemchek, BA



# THURSDAY PROGRAM DETAILS

## Tactile Assessments and Treatments for Upper Extremity Movement Recovery in Individuals with Stroke: Where We Are and Where We are Going

Thursday, April 11, 2024 • 4:30 pm – 6:00 pm • La Vista

Course Director: Netta Gurari, PhD

### DESCRIPTION:

Accurate tactile perception is critical for functional independence, such as when lifting a cup to drink. Individuals with impaired tactile perception struggle to feel the cup in their hand, which can lead to spills, burns, and increased frustration. Upwards of \$40 billion is spent in the USA annually on the ~3 million individuals with stroke who experience tactile perceptual deficits. The severity of their tactile deficits predicts the extent to which these individuals with stroke will recover their arm and hand movement and independence in performing physical activities. Despite the financial burden, prevalence, functional implications, and significant prognostic indicators, currently available tactile assessments and treatments for individuals with stroke remain limited and insufficient. Our poor understanding of the neural mechanisms governing tactile deficits post stroke hinders the effective usage of such assessments and treatments. We will provide an overview of the field from the perspectives of clinical relevance, tactile assessment design, and tactile stimulation efficacy. We propose that future research in this area can lead to the development of more precise somatosensory assessments, improved treatment strategies, and informed prognostic criteria for millions of patients with stroke experiencing tactile deficits and living with disability.

### SPEAKERS:



Netta Gurari, PhD



Kevin Parcetich,  
DPT



Na Jin Seo, PhD



Jeff Min-In Yau, PhD

### SCHEDULE:

4:30 – 4:35pm: **Introduction** – Netta Gurari, PhD

4:35 – 4:50pm: **Basic Science of Touch** – Jeff Min-In Yau, PhD

4:50 – 5:05pm: **Current Summary of Tactile Assessments for Individuals With Stroke** – Kevin Parcetich, DPT

5:05 – 5:20pm: **Gaps in Existing Assessments From a Methodological and Engineering Design Perspective** – Netta Gurari, PhD

5:20 – 5:35pm: **Approaches for Using Tactile Stimulation to Enhance Sensorimotor Recovery in Individuals With Stroke** – Na Jin Seo, PhD

5:35 – 6:00pm: **Discussion** - ALL

# FRIDAY PROGRAM DETAILS

## 3D Markerless Motion Capture: Increasing Diversity & Inclusivity of 3D Motion Assessment

Friday, April 12, 2024 • 8:30 am – 10:00 am • La Vista

Course Director: Elizabeth Condliffe, MD, PhD

### DESCRIPTION:

While 3D motion analysis is an established tool for quantitative movement assessment, it is used less frequently in neurorehabilitation research. Specifically, when applied to 3D gait analysis, it is recognized to enhance clinical decision-making and improve patient outcomes. However, it is expensive and not readily available in many neurorehabilitation settings. Even when available, the time involved, participant burden (i.e., marker placement, lab-specific clothing, repetitive trials), and technical challenges related to marker occlusions limit its accessibility to all individuals represented in neurorehabilitation. Individuals remote from tertiary care centres, with religious or self-image objections to revealing clothing, with sensory or behavioural impairments that preclude the use of markers, or who use bulky gait aids can now be represented in research or have their care informed by movement assessment performed with markerless motion capture (MMC). While validity of MMC has been established in a variety of situations, these use cases are not directly applicable to all current uses of marker-based applications. Current limitations will be discussed. New applications facilitated by faster data acquisition, lower costs, and reduced need for local expertise will also be discussed. Symposium participants will brainstorm in smaller groups the use of markerless motion analysis in their research and/or clinical programs, with potential applications provided as seed ideas if needed. Discussion of questions stemming from those conversations will be had as a large group.

### SPEAKERS:



Elizabeth Condliffe,  
MD, PhD



Amanda Rande, BSc



Martin Ferguson-  
Pell, PhD



Carolynn Patten, PT,  
PhD

### SCHEDULE:

8:30 – 8:39am: **Introduction** – Elizabeth Condliffe, MD, PhD

8:39 – 8:52am: **Equitable Access For 3-D Instrumented Gait Analysis** – Amanda Rande, BSc

8:52 – 9:05am: **Access in Supported-Living and Virtual Clinical Settings** – Martin Ferguson-Pell, PhD

9:05 – 9:18am: **Access in Community and Patient-Facing Clinical Settings** – Carolynn Patten, PT, PhD

9:18 – 9:25am: **Small Group Exercise Introduction & Set-Up** – Elizabeth Condliffe, MD, PhD

9:25 – 9:40am: **Small Group Exercise** – ALL

9:40 – 9:55am: **Large Group Exercise** – ALL

9:55 – 10:00am: **Discussion** – ALL

# FRIDAY PROFESSIONAL DEVELOPMENT SESSION A

## Applications of Emerging Computer Vision Technologies in Neurorehabilitation

Friday, April 12, 2024 • 10:15 am – 11:45 am • La Vista

Course Director: Ryan Roemmich, PhD

### DESCRIPTION:

Computer vision is a form of artificial intelligence with significant potential for applications in neurorehabilitation. Here, we will focus on human pose estimation – a computer vision technology that identifies and tracks anatomical landmarks of the human body automatically using only simple digital videos – and its applications for motor assessment in adult and pediatric populations with neurologic damage or disease. Pose estimation technologies offer significant potential for improving accessibility of quantitative motor assessment in neurorehabilitation, as automated motor assessments could be performed using only videos easily recorded from a smartphone, tablet, or other readily available household device. Specific topics will include: 1) novel approaches of using computer vision to measure different aspects of movement in both adult and pediatric populations, 2) innovative approaches to using these technologies to identify trackable, movement-based biomarkers, and 3) limitations of currently existing technologies and the path toward clinical implementation. Our session will cover existing applications in neurologic populations including stroke, Parkinson's disease, and cerebral palsy, and we will include applications targeting both the upper and lower extremities. Specific emphases will be placed on training the audience for real-world (e.g., in-home or in-clinic vs. laboratory-based) applications and longitudinal tracking. We will also highlight current barriers and facilitate discussion about future and/or alternative approaches. Computer vision technologies offer untapped potential for making it easier to measure human movement in virtually any setting, and this symposium aims to progress the field toward realizing this potential. Here, we will focus on introducing these technologies and helping the audience to remove barriers with regard to their clinical and research implementation.

### SPEAKERS:



Ryan Roemmich,  
PhD



R. James Cotton,  
MD, PhD



Rachel Hawe,  
PT, DPT, PhD

### SCHEDULE:

10:15 – 10:35am: **Applications of Computer Vision in Neurorehabilitation Using Only a Single Camera** – Ryan Roemmich, PhD

10:35 – 10:55am: **Computer Vision Applications to Examine Upper Extremities in Pediatric Populations** – Rachel Hawe, PT, DPT, PhD

10:55 – 11:15am: **Multiview Markerless Motion Capture and Big Gait Data: What is it Good For?** – R. James Cotton, MD, PhD

11:15 – 11:25am: **Discussion of Barriers, Limitations, and Future Directions** – ALL

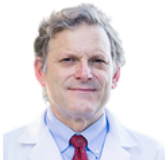
11:25 – 11:45am: **Discussion** – ALL

# 2024 ASN AWARDS CEREMONY

Friday, April 12, 2024 • 11:45 am – 12:15 pm • La Vista



*Jyutika Mehta,  
PhD, CCC-SLP*



*Steve Cramer,  
MD, MMSc*

## 2024 FELLOW OF AMERICAN SOCIETY OF NEUROREHABILITATION (FASNR) RECIPIENT

The title of Fellow of the American Society of Neurorehabilitation is reserved for individuals who have contributed significantly to the field of Neurorehabilitation, and also to the American Society of Neurorehabilitation.



*Karunesh Ganguly,  
MD, PhD*

## 2024 OUTSTANDING NEUROREHABILITATION CLINICIAN-SCIENTIST AWARD RECIPIENT

The award, based on the evaluation of his or her peers, honors scholarly achievements and contributions to knowledge about mechanisms of neural repair, translational research from mechanisms of repair to clinical practice, or clinical Neurorehabilitation. Nominations are invited from the membership of the American Society of Neurorehabilitation.

## 2024 KENNETH VISTE, JR., MD MEMORIAL LECTURESHIP AWARD RECIPIENT

Kenneth M. Viste, Jr., MD was a tireless advocate for Neurorehabilitation and the American Society of Neurorehabilitation, and was active in the organization since its inception as President, Membership Committee Chair and a member of the Practice Issues Committee. The American Society of Neurorehabilitation honors his memory by presenting the award annually to an individual that has supported the mission and vision of the American Society of Neurorehabilitation over the course of his or her career, by supporting neurorehabilitation as a field, engaging in clinical and educational work, and making our medical peers aware of the importance of neurorehabilitation.



*Beth Fisher,  
PT, PhD*

## 2024 DIVERSITY FELLOWS



*Alex Benedetto*



*Manuel Portillo-  
Jimenez*



*Alexandra Reed*

# FRIDAY PROGRAM DETAILS

## Reticulospinal Contributions to Movement after Stroke and Spinal Cord Injury: Impact on Rehabilitation

Friday, April 12, 2024 • 1:45 pm – 3:15 pm • La Vista

Course Director: Monica Perez, PT, PhD

### DESCRIPTION:

The primate reticulospinal tract is considered to control proximal and axial muscles and to be involved in locomotion, reaching, and posture. Recent data expanded the knowledge on the reticulospinal tract demonstrating its influence on hand movements in animals and humans. Thus, understanding the contributions of the reticulospinal system to movement might have significant implications for neurorehabilitation. Following unilateral brain injury, monoaminergic reticulospinal drive increases resulting in exaggerated responses to stretch reflex input and upregulated reticulospinal motor commands. This causes the expression of hyperactive stretch reflexes (spasticity) and losses of independent joint control (limb synergies), respectively, in the paretic upper and lower extremities. Following incomplete chronic spinal cord injury (SCI), imbalanced contributions from the corticospinal and reticulospinal tract have been demonstrated. Here, individuals with SCI with spasticity show lesser corticospinal and larger reticulospinal influences on spastic muscles, especially in the lower limbs, compared with those with no spasticity and able-bodied individuals. This session proposes to discuss the contributions of the reticulospinal system following brain versus spinal cord lesions in animals and humans, associated deficits in motor output as well as novel rehabilitation approaches to treat these deficits using targeted physical and/or pharmacological means. The discussants will provide evidence on the impact of losses of corticospinal/corticobulbar (stroke) and corticospinal/reticulospinal motor pathways (SCI) resulting in functional motor deficits in these patient populations. They will not only provide cutting-edge insights into how these losses result in movement impairments but also new ways to treat these impairments to optimize clinical rehabilitation outcomes.

### SPEAKERS:



Monica Perez,  
PT, PhD



Stuart Baker, PhD



Jules Dewald,  
PT, PhD

### SCHEDULE:

1:45 – 1:49pm: **Introduction** – Monica Perez, PT, PhD

1:49 – 2:11pm: **For Better, For Worse: Reticulospinal Contributions to Recovery After Stroke and Spinal Cord Injury** – Stuart Baker, PhD

2:11 – 2:33pm: **The Contributions of Reticulospinal Pathways Post Stroke** – Jules Dewald, PT, PhD

2:33 – 2:55pm: **Reticulospinal Contributions After Spinal Cord Injury: From Reorganization to Treatments** – Monica Perez, PT, PhD

2:55 – 3:15pm: **Discussion** – ALL

# FRIDAY PROFESSIONAL DEVELOPMENT SESSION B

## How to Integrate Qualitative Methods Into Your Neurorehabilitation Research

Friday, April 12, 2024 • 3:30 pm – 5:00 pm • La Vista

Course Director: Marika Demers, PhD

### DESCRIPTION:

Mixed methods are the use of both qualitative and quantitative methods in a study. In the recent years, there has been a growing interest to combine both qualitative and quantitative methods to understand complex health problems. For neurorehabilitation researchers who are new to mixed methods, it may be challenging to identify which research problem calls for a mixed methods approach and how to combine both qualitative and quantitative components. This professional development session provides the basis of mixed methods research, with a focus on the integration of qualitative data to quantitative research. Specifically, the session will provide an overview of three main mixed methods study designs and how to collect and analyse qualitative data. Interviewing techniques will be presented, with examples of effective and ineffective techniques. Participants will have the opportunity to develop their own qualitative questions with guidance from the panelists. In sum, this professional development session will encourage neurorehabilitation researchers to apply mixed methods to their research to facilitate innovative, patient-centred methodological solutions to address the complex challenges in neurorehabilitation.

### SPEAKERS:



Marika Demers, PhD



Amelia Cain,  
PT, DPT



Julie Schwertfeger,  
PT, PhD



Jessica Cassidy,  
DPT, PhD

### SCHEDULE:

3:30 – 3:50pm: **Overview of Mixed Methods** – Marika Demers, PhD

3:50– 4:10pm: **Interviewing Techniques** – Julie Schwertfeger, PT, PhD

4:10 – 4:35pm: **How to Ask Effective Questions** – Amelia Cain, PT, DPT

4:35 – 4:45pm: **Conclusion and Take Home Message** – Jessica Cassidy, DPT, PhD

4:45 – 5:00pm: **Discussion** – ALL

# SATURDAY PROGRAM DETAILS

## Frontiers in Neuro Regenerative Rehabilitation

Saturday, April 13, 2024 • 8:30 am – 10:00 am • La Vista

Course Director: Hirotaka Iijima, PhD, PT

### DESCRIPTION:

As a cross-disciplinary field, regenerative rehabilitation seeks to combine tissue engineering and regenerative medicine with applied biophysics and tissue/organ-specific rehabilitation approaches to enhance tissue repair and function outcomes. The field of regenerative rehabilitation has expanded significantly in the past decade, especially for the treatment of neurological diseases. This session will focus on introducing the advances of regenerative rehabilitation for the treatment of neurological diseases and neural repair. The speakers will introduce the Alliance for Regenerative Rehabilitation Research and Training (AR3T) and give an overview of the regenerative rehabilitation field, regenerative rehabilitation research, and funding opportunities. Two invited speakers will discuss cutting-edge research in regenerative rehabilitation including organ-on-a-chip and in situ tissue regeneration after stroke.

### SPEAKERS:



*Hirotaka Iijima,  
PhD, PT*



*Kai Wang, PhD*



*Michel Modo, PhD*



*Sean Savitz, MD*

### SCHEDULE:

8:30 – 8:40am: **Introduction** – Hirotaka Iijima, PhD, PT

8:40 – 9:00am: Kai Wang, PhD

9:00 – 9:20am: Michel Modo, PhD

9:20 – 9:40am: Sean Savitz, PhD

9:40 – 10:00am: **Discussion** – ALL

# SATURDAY D.E.I. SESSION KEYNOTE

## Is Representativeness an Alternative to DEI in Clinical Research?

Saturday, April 13, 2024 • 10:00 am – 11:00 am • La Vista

Speaker: Gladys Maestre, MD, PhD

### DESCRIPTION:

In this session, we will gain insights through discussion of why I need to include people of diverse backgrounds in my research, how much diversity is enough to achieve inclusion, and what is the relationship between representation and generalizability in clinical trials.

### SPEAKER:



*Gladys Maestre, MD, PhD*

**Gladys Maestre, MD, PhD**, is Professor of Neuroscience and Human Genetics and Director of the Rio Grande Valley Alzheimer's Disease Resource Center for Minority Aging Research (AD-RCMAR) at the University of Texas Rio Grande Valley School of Medicine. She is also Co-Director of the South Texas Alzheimer's Disease Research Center and Professor Emerita at the University of Zulia in Maracaibo, Venezuela.

Dr. Maestre received her M.D. from the University of Zulia in Venezuela and her M.Phil. and Ph.D. from Columbia University, and completed post-doctoral training in the Department of Psychiatry at the Massachusetts General Hospital. She has led the Maracaibo Aging Study as principal investigator since 1998. This is a longitudinal population-based study of dementia and other age-related health problems that has followed more than 2,500 subjects since its inception and has provided important insights about the aging of Latinos.

A recipient of numerous awards and recognized author, the focus of her research is to advance age-related conditions that disproportionately affect Latinos, at the intersection of biomedical, social and behavioral, and implementation sciences.



# SATURDAY PROGRAM DETAILS

## Neural Reorganization: Fact or Fiction

Saturday, April 13, 2024 • 11:15 am – 12:45 pm • La Vista

Course Director: Kelsey Baker

### DESCRIPTION:

Since the 1900s, the concept of neuroplasticity has been an evolving field. Initial work by Pavlov and Hebb laid the foundation for decades of research regarding the structural blueprint of the brain. However, in the past decade, the concepts of neural reorganization and plasticity have been more frequently questioned from multiple lenses, such as memory, functional recovery and aging. We believe that this controversy has particular importance to the field of neural repair and rehabilitation and we seek to discuss it directly. During our session, we aim to discuss: What is plasticity and cortical reorganization? Is there a limit and are we over-interpreting the data? But more importantly, why does this matter and what could it mean for our field? We hope you will join us for this interactive session as we consider this controversial topic.

### SPEAKERS:



*Kelsey Baker, PhD*



*Trisha Kesar, PT,  
PhD*



*Seth Hays, PhD*



*Dimitry Sayenko,  
MD, PhD*

### SCHEDULE:

11:15 – 11:25am: **Introduction**

11:25 – 12:05pm: **Data Supporting & Data Against**

12:05 – 12:15pm: **Putting it All Together**

12:15 – 12:45pm: **Discussion** – ALL

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## **P. 1 Referent data for investigations of upper limb motor behavior: harmonized accelerometry data from three cohorts of typically-developing children**

Catherine Lang, Catherine Hoyt, Jeffrey Konrad, Kayla Bell, Natasha Marrus, Marghuretta Bland, Keith Lohse, Allison Miller

Washington University School of Medicine, Saint Louis, USA.

## **P. 2 The Neural Underpinnings and Sensory Feedback Augmentation During Split-belt Treadmill Adaptation in People with Multiple Sclerosis**

Andrew Hagen, Jaclyn Stephens, Brett Fling

Colorado State University, Fort Collins, USA.

## **P. 3 Correlation between walking function and transcranial magnetic stimulation derived measures in spinal cord injury**

Avery Foreman<sup>1</sup>, Elliot Frost<sup>2</sup>, Faith Meza<sup>2</sup>, Chad Swank<sup>2</sup>, Hui-Ting Goh<sup>1</sup>

<sup>1</sup>Texas Woman's University, Dallas, USA. <sup>2</sup>Baylor Scott & White Institute for Rehabilitation, Dallas, USA.

## **P. 4 Behavioral and Neural Correlates of Post-Stroke Fatigue: a randomized controlled trial protocol**

Kuan-Chun Liao<sup>1</sup>, Isabelle Christian<sup>1</sup>, Jill Stewart<sup>2</sup>, Elaine Trudelle-Jackson<sup>1</sup>, Wanyi Wang<sup>3</sup>, Ty Shang<sup>4</sup>, Hui-Ting Goh<sup>1</sup>

<sup>1</sup>Texas Woman's University, Dallas, USA. <sup>2</sup>University of South Carolina, Columbus, USA. <sup>3</sup>Texas Woman's University, Houston, USA. <sup>4</sup>University of Texas Southwestern Medical Center, Dallas, USA

## **P. 6 Advancing the Field of Neurorehabilitation through Data Harmonization: Harmonizing 10+ Years of Upper Limb Accelerometry Data**

Allison Miller, Keith Lohse, Marghuretta Bland, Jeffrey Konrad, Catherine Hoyt, Catherine Lang

Washington University in St. Louis, St. Louis, USA.

## **P. 8 Magnetic Resonance Imaging Indicators of Post-Stroke Spasticity**

Katharine A. Scarlat<sup>1,2</sup>, Theodore Wein<sup>3,4,5</sup>, Marie-Hélène Boudrias<sup>2,6</sup>, Alexander Thiel<sup>3,7</sup>, Anatol G. Feldman<sup>2,8</sup>, Mindy F. Levin<sup>2,9</sup>

<sup>1</sup>Integrated Program in Neuroscience, McGill University, Montreal, Canada. <sup>2</sup>Jewish Rehabilitation Hospital, Centre for Interdisciplinary Research in Rehabilitation, Montreal, Canada. <sup>3</sup>Department of Neurology and Neurosurgery, McGill University, Montreal, Canada. <sup>4</sup>McGill University Health Center, Montreal, Canada. <sup>5</sup>St Mary's Hospital, Montreal, Canada. <sup>6</sup>School of Physical and Occupational Therapy, Montreal, Canada. <sup>7</sup>Jewish General Hospital, Montreal, Canada. <sup>8</sup>Department of Neuroscience, University of Montreal, Montreal, Canada. <sup>9</sup>School of Physical and Occupational Therapy, Montreal, Canada.

## **P. 9 Botulinum Toxin Type A vs Dry Needling in the management of lower limb spasticity in patients post-stroke: A controlled proof-of-concept trial**

Joy Khayat<sup>1,2</sup>, Clara Pujol-Fuentes<sup>3</sup>, Pablo Herrero<sup>4</sup>, Wim Saeys<sup>5</sup>, Barte Eeckhout<sup>6</sup>, Theodore Wein<sup>1</sup>, Mindy Levin<sup>1,7</sup>

<sup>1</sup>McGill University, Montreal, Canada. <sup>2</sup>Jewish Rehabilitation Hospital, Montreal, Canada. <sup>3</sup>Universidad Europea de Valencia, Valencia, Spain. <sup>4</sup>IIS ARAGON, University of Zaragoza, Zaragoza, Spain. <sup>5</sup>University of Antwerp (ANT), Wilrijk, Belgium. <sup>6</sup>University of Antwerp, Turnhout, Belgium. <sup>7</sup>Jewish Rehabilitation Hospital, Montreal, Canada.

## **P. 11 Combining cerebellar transcranial direct current stimulation (tDCS) with constraint-induced language therapy (CILT) in individuals with non-fluent aphasia: a novel approach for targeting discourse**

Madelyn Graham, Marie Meysembourg, Sharyl Samargia-Grivette, Lynette Carlson, Rebecca Gilbertson

University of Minnesota Duluth, Duluth, USA.

## **P. 12 Can working memory be impacted by combining cerebellar tDCS and Constraint-Induced Language Therapy in non-fluent aphasia?**

Haley Evans, Sharyl Samargia-Grivette, Lynette Carlson, June Lee

University of Minnesota Duluth, Duluth, USA.

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**P. 13 Within-session changes in propulsion asymmetry have minimal effect on overall gait asymmetry in individuals post-stroke**

Sarah Kettlety, James Finley, Kristan Leech  
University of Southern California, Los Angeles, USA.

**P. 14 A Novel Approach to Patients with Maladaptive Behavior on an Acute Inpatient Rehabilitation Unit Following Acquired Brain Injury (ABI) : The Utility of Applied Behavior Analysis (ABA) in the Rehabilitation Setting.**

Arielle Reindeau<sup>1</sup>, Michael Makley<sup>1,2</sup>, Benjamin Ingraham<sup>1</sup>, Eric Spier<sup>1,2</sup>  
<sup>1</sup>Craig Rehabilitation and Research Hospital, Englewood, USA. <sup>2</sup>University of Colorado Department of Physical Medicine and Rehabilitation, Aurora, USA.

**P. 15 Transition State Disorders following Moderate to Severe Brain Injury: A Novel Framework for Understanding Agitation, Confabulation, and Maladaptive Behavior after Acquired Brain Injury (ABI). A Series of 3 Case Studies**

Michael Makley<sup>1,2</sup>, Eric Spier<sup>1</sup>, Matthew Loftspring<sup>1</sup>, Benjamin Ingraham<sup>1</sup>  
<sup>1</sup>Craig Rehabilitation and Research Hospital, Englewood, USA. <sup>2</sup>University of Colorado Department of Physical Medicine and Rehabilitation, Aurora, USA.

**P. 16 Bimanual and Unimanual Rehabilitative Training After Stroke: Patterns of Activity-Dependent Structural Plasticity in Peri-lesion and Contra-lesion Cortices**

Victoria Nemchek, Celeste J. Hoang, Vinuthna Mallampaty, Morgan McCrea, Nikita Potdar, Vennila Satheesh, Deekshita Sundararaman, Theresa A. Jones  
The University of Texas at Austin, Austin, USA.

**P. 18 Assessing the Feasibility of Collecting Reliable Center-out Reaching Measures at the Bedside and Clinic Using Accessible Single Camera Motion Capture Systems in the First Three Months Following Stroke**

Megan McCune<sup>1</sup>, Julia Moon<sup>1</sup>, Tullia Lieb<sup>2</sup>, Dominica Randazzo<sup>1</sup>, Robert Matthew<sup>1</sup>  
<sup>1</sup>University of California at San Francisco, San Francisco, USA. <sup>2</sup>University of Southern California, Los Angeles, USA.

**P. 19 Lower limb resistance exercise and treadmill training best improve walking in multiple sclerosis: Results of a systematic review and meta-analysis**

Syamala Buragadda<sup>1</sup>, Syed Raza<sup>1</sup>, Abby Blaney<sup>1</sup>, Amber Critch<sup>1</sup>, Evan MacKenzie<sup>1</sup>, Sydney Hiller<sup>1</sup>, Leah Peckham<sup>1</sup>, Hannah Murphy<sup>1</sup>, Jaideep Melam<sup>1,2</sup>, Kristen Romme<sup>3</sup>, Michelle Ploughman<sup>1</sup>  
<sup>1</sup>Recovery and Performance Laboratory, Faculty of Medicine, Memorial University of Newfoundland, St. John's, Canada. <sup>2</sup>Prince of Wales Collegiate, St. John's, Canada. <sup>3</sup>Health Sciences Library, Faculty of Medicine, Memorial University of Newfoundland, St. John's, Canada.

**P. 20 A Sensor-Derived Metric to Differentiate Between Upper Extremity Impairment Levels Following Stroke**

Megan McCune, Robert Matthew  
University of California at San Francisco, San Francisco, USA.

**P. 21 Perception of transcranial electrical stimulation (TES) affects blinding efficacy in young children differently than young adults**

Sophia Bertrand<sup>1</sup>, Tonya Rich<sup>2</sup>, Samuel Nemanich<sup>1</sup>  
<sup>1</sup>Marquette, Milwaukee, USA. <sup>2</sup>Minneapolis VA Healthcare, Minneapolis, USA.

**P. 22 Assessment and treatment of bimanual function in children with cerebral palsy: a scoping review**

Anne Claire David<sup>1</sup>, Laura Fournier-Poisson<sup>1</sup>, Maxime Robert<sup>2</sup>, Marika Demers<sup>3</sup>  
<sup>1</sup>Université de Montréal Montreal, Montreal, Canada. <sup>2</sup>Université Laval, Quebec, Canada. <sup>3</sup>Université de Montréal Montreal, Montreal, Canada. Centre de recherche interdisciplinaire en réadaptation du Montréal métropolitain - IURDPM, Montreal, Canada.

# POSTERS LISTING

**P. 23 Home-based Self-Delivered Prehabilitation Intervention to Proactively Reduce Fall Risk in Older Adults: A Pilot Randomized Controlled Trial of Transcranial Direct Current Stimulation and Motor Imagery**

Clayton Swanson<sup>1</sup>, Sarah Vial<sup>2</sup>, Audrey Whiteman<sup>2</sup>, Todd Manini<sup>2</sup>, Kimberly Sibille<sup>2</sup>, David Clark<sup>1</sup>  
*1University of Florida, Gainesville, USA. Malcom Randall VA Medical Center, Gainesville, USA. 2University of Florida, Gainesville, USA.*

**P. 24 Applying Elastic Resistance Bands for Gait Training: A Simulation-Based Study to Determine How Band Configuration Affects Gait Biomechanics and Muscle Activation**

Sierra Foley, Edward Washabaugh  
*Wayne State University, Detroit, USA.*

**P. 25 Perception of task duration impacts locomotor patterns and energy expenditure during split belt adaptation and de-adaptation**

Samantha Jeffcoat<sup>1</sup>, Adrian Aragon<sup>2</sup>, Andrian Kuch<sup>1</sup>, Shawn Farrokhi<sup>1</sup>, Natalia Sanchez<sup>1</sup>  
*1Chapman University, Irvine, USA. 2Chapman University, Orange, USA.*

**P. 26 VNS-Enhanced Tactile Rehabilitation: A Pathway to Improved Somatosensation Post-Neurological Injury**

Saeid Kian<sup>1</sup>, Michael Kilgard<sup>1</sup>, Seth Hays<sup>2</sup>, Robert Rennaker<sup>1,2</sup>, Joseph Epperson<sup>2</sup>, Kaitlyn Malley<sup>1</sup>, Zachary Bynum<sup>1</sup>, Spencer Stinson<sup>2</sup>, Emmanuel Adehunoluwa<sup>1</sup>, Rachael Hudson<sup>1</sup>  
*1Texas Biomedical Device Center, Richardson, USA. School of Behavioral and Brain Science, University of Texas at Dallas, Richardson, USA. 2Texas Biomedical Device Center, Richardson, USA. Erik Jonsson School of Engineering and Computer Science, Richardson, USA.*

**P. 27 Are there Differences in Walking Exercise Dose between Subgroups of People with Chronic Stroke?**

Kiersten McCartney, Duncan Thibodeau Tulumieri, Ryan Pohlig, Darcy Reisman  
*University of Delaware, Newark, USA.*

**P. 28 Exploring Neuroplasticity Changes in Neurotoxin-induced Parkinson's Disease: A Preliminary Analysis using Transcranial Magnetic Stimulation**

Tomas Gomez<sup>1</sup>, Kelsey Baker<sup>2</sup>, Nawaz Hack<sup>2</sup>, Daniel Salinas<sup>2</sup>, Ramu Vadakupuram<sup>2</sup>  
*1University of Texas Rio Grande Valley, Brownsville, USA. 2University of Texas Rio Grande Valley - Institute of Neuroscience, Harlingen, USA.*

**P. 29 Vagus nerve stimulation delivered during at-home, task-specific training improves function after spinal cord injury or stroke**

Kaitlyn Malley<sup>1</sup>, Joseph Epperson<sup>2</sup>, Zachary Bynum<sup>1</sup>, Saeid Kian<sup>1</sup>, Benjamin Stanislav<sup>1</sup>, Joel Wright<sup>3</sup>, Emmanuel Adehunoluwa<sup>1,3</sup>, David Pruitt<sup>3</sup>, Chad Swank<sup>4</sup>, Christi Stevens<sup>4</sup>, Jaime Gillespie<sup>4</sup>, Danae Arnold<sup>4</sup>, Jane Wigginton<sup>3</sup>, Robert Rennaker<sup>3</sup>, Seth Hays<sup>2,3</sup>, Michael Kilgard<sup>1,3</sup>  
*1School of Behavioral and Brain Sciences, The University of Texas at Dallas, Richardson, USA. Texas Biomedical Device Center, Richardson, USA. 2Erik Jonsson School of Engineering and Computer Science, The University of Texas at Dallas, Richardson, USA. 3Texas Biomedical Device Center, Richardson, USA. 4Baylor Scott & White Research Institute, Dallas, USA.*

**P. 30 Quantifying the Effect of Trunk Postural Control on Reaching Deficits post Hemiparetic Stroke**

Kathleen Suvada<sup>1</sup>, Jasjit Deol<sup>2</sup>, Julius Dewald<sup>1</sup>, Ana Maria Acosta<sup>1</sup>  
*1Northwestern University, Evanston, USA. 2University of Alberta, Edmonton, Canada.*

**P. 31 Repetitive transcranial magnetic stimulation combined with multi-modality aphasia therapy for chronic post-stroke aphasia: A randomized clinical trial**

Trevor Low<sup>1</sup>, Kevin Lindland<sup>2</sup>, Adam Kirton<sup>1,3,4,5</sup>, Helen Carlson<sup>1,3,4,5</sup>, Ashley Harris<sup>4,5,6</sup>, Bradley Goodyear<sup>1,4,6</sup>, Oury Monchi<sup>1,4,6,7,8</sup>, Michael Hill<sup>1,4,6</sup>, Miranda Rose<sup>9</sup>, Sean Dukelow<sup>1,4,10</sup>  
*1Department of Clinical Neurosciences, Cumming School of Medicine, University of Calgary, Calgary, Canada. 2Department of Allied Health, Alberta Health Services, Calgary, Canada. 3Department of Pediatrics, Cumming School of Medicine, University of Calgary, Calgary, Canada. 4Hotchkiss Brain Institute, University of Calgary, Calgary, Canada. 5Alberta Children's Hospital Research Institute, University of Calgary, Calgary, Canada. 6Department of Radiology, Cumming School of Medicine, University of Calgary, Calgary, Canada. 7Centre de recherche de l'institut universitaire de gériatrie de Montréal, Montreal, Canada. 8Département de radiologie, radio-oncologie et médecine nucléaire, Faculté de médecine, Université de Montréal, Montreal, Canada. 9School of Allied Health, Human Services and Sport, La Trobe University, Melbourne, Australia. 10Division of Physical Medicine and Rehabilitation, University of Calgary, Calgary, Canada.*

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## **P. 32 Transcallosal inhibition in recovering stroke subjects**

Emily Fokas1, Myriam Taga1, Leticia Hayes1, Charalambos Charalambous1,2, Sharmila Raju1, Heidi Schambra1  
1NYU Grossman School of Medicine, New York, USA. 2University of Nicosia Medical School, Nicosia, Cyprus

## **P. 33 Deficits in cognitive aspects of movement control differ based on the side of brain damage in chronic stroke survivors**

Pramisha Thapa1, Lelti Asgedom1, Mark Folkertsma1, Scott Lunos1, Diane Chappuis2, Shanie Jayasinghe1  
1University of Minnesota, Minneapolis, USA. 2Courage Kenny Rehabilitation Institute, Minneapolis, USA.

## **P. 34 Electrical stimulation-based treadmill training modulates spinal reflex excitability in people with stroke.**

Jasmine Hope1, Fisayo Aloba1, Jacob Spencer2, Catherine Mason1, Alejandro Lopez1, Trisha Kesar1  
1Emory University, Atlanta, USA. 2Georgia Tech, Atlanta, USA.

## **P. 35 Descending ipsi- and contralateral projections benefit motor behavior in chronic stroke**

Myriam Taga1, Yoon N. G. Hong2, Charalambos C. Charalambous3, Sharmila Raju1, Leticia Hayes1, Jing Lin1, Yian Zhang4, Michael Houston2, Yingchun Zhang2, Pietro Mazzone5, Jinsook Roh2, Heidi M. Schambra1  
1Department of Neurology, New York University Grossman School of Medicine, New York, USA. 2Department of Biomedical Engineering, University of Houston, Houston, USA. 3Department of Neurology, Duke University School of Medicine, Durham, USA. 4Department of Population Health, New York University Grossman School of Medicine, New York, USA. 5Department of Movement Disorders, Ohio State University, Ohio, USA.

## **P. 36 The effect of post-acute rehabilitation setting on 90-day mobility function after stroke**

Margaret French1, Heather Hayes1, Joshua Johnson2, Daniel Young3, Ryan Roemmich4, Preeti Raghavan5  
1University of Utah, Salt Lake City, USA. 2Cleveland Clinic, Cleveland, USA. 3University of Nevada Las Vegas, Las Vegas, USA. 4Kennedy Krieger Institute, Baltimore, USA. 5Johns Hopkins Hospital, Baltimore, USA.

## **P. 37 Machine learning reveals ipsilateral brain activation during a manual dexterity task in people with multiple sclerosis without disability**

Sadman Saumik Islam, Bruna D Baldasso, Michelle Ploughman, Xianta Jiang  
Memorial University of Newfoundland, St. John's, Canada.

## **P. 38 Intraoperative Testing of High Frequency Electrical Motor Nerve Block in Humans: Case Report**

Jayne Knutson1,2,3, Kyle Chepla1,2,3, Richard Wilson1,2,3, Michael Fu1,2,3, Emily Imka3, Shane Bender2, John Chae1,2,3, Kevin Kilgore1,2,3, Niloy Bhadra1,2,3  
1The MetroHealth System, Cleveland, USA. 2Case Western Reserve University, Cleveland, USA. 3Cleveland FES Center, Cleveland, USA.

## **P. 39 Operant conditioning of stimulus-triggered EMG evoked potentials to improve sensorimotor functions in chronic incomplete spinal cord injury.**

Krista Fjeld, Blair Dellenbach, Alan Phipps, Allison Lewis, Roland Cote, AikoThompson  
Medical University of South Carolina, Charleston, USA.

## **P. 40 Relationship between resting state sensorimotor network connectivity and lower limb performance after stroke; analysis using graph theory approach**

Margaret Skelly1, Sarah Carr2, Jessica McCabe1, Ahlam Salameh1, Lisa Leonhart1, Kelsey Rose Duncan1,3, Svetlana Pundik1,4  
1Cleveland VA Medical Center, Cleveland, USA. 2Kings College London, London, United Kingdom. 3University Hospitals of Cleveland, Cleveland, USA. 4Case Western Reserve University school of Medicine, Cleveland, USA.

## **P. 41 Fast training improves short-term motor performance of the paretic arm in chronic stroke survivors: The FAST Randomized Clinical Trial**

Yannick Darmon1, Shailesh Kantak2, Hannah Cone3, Carolee Winstein1, Emily Rosario3, Nicolas Schweighofer1  
1University of Southern California, Los Angeles, USA. 2Moss Rehabilitation Research Institute, Elkins Park, USA. 3Casa Colina Research Institute, Pomona, USA.

# POSTERS LISTING

## **P. 42 Larger infarct volume and greater lesion load of the corticospinal tracts correlate with higher fractional anisotropy of the contralesional frontal and parietal white matter**

Svetlana Pundik<sup>1,2</sup>, Kelsey Rose Duncan<sup>1,3</sup>, Jessica McCabe<sup>1</sup>, Ahlam Saleme<sup>1</sup>, Margaret Skelly<sup>1</sup>, Trenley Anderson<sup>2</sup>, Pragnya Iyengar<sup>2</sup>, Lisa Leonhardt<sup>1</sup>, Terri Hise<sup>1</sup>, Sarah Carr<sup>4</sup>  
<sup>1</sup>Cleveland VA Medical Center, Cleveland, USA. <sup>2</sup>Case Western Reserve University School of Medicine, Cleveland, USA. <sup>3</sup>University Hospitals of Cleveland, Cleveland, USA. <sup>4</sup>King's College London, London, United Kingdom.

## **P. 43 APOE genotype alters cerebrovascular response to orthostasis over the course of Alzheimer's disease progression**

Jacqueline Palmer<sup>1</sup>, Carolyn Kaufman<sup>2</sup>, Alicen Whitaker-Hilbig<sup>3</sup>, Sandra Billinger<sup>2</sup>  
<sup>1</sup>University of Minnesota, Minneapolis, USA. <sup>2</sup>University of Kansas Medical Center, Kansas City, USA. <sup>3</sup>Medical College of Wisconsin, Madison, USA.

## **P. 44 Determining the Impact of Cognitive Load on Brain-Muscle Functional Connectivity in Individuals with Chronic Stroke**

Rachana Gangwani, Elizabeth Loftus, Umesh Radhakrishnan, Harshita Gudipudi, Jessica Cassidy  
University of North Carolina, Chapel Hill, USA.

## **P. 45 Real-time feedback improves performance of vestibular rehabilitation exercises**

Riley Sheehan<sup>1</sup>, Timothy Zehnbauer<sup>1</sup>, Alan Register<sup>1</sup>, Jackson Cornelius<sup>1</sup>, Nathan Pickle<sup>1</sup>, Linda D'Silva<sup>2</sup>, Karen Skop<sup>3</sup>, Paulien Roos<sup>1</sup>  
<sup>1</sup>ICFD Research Corporation, Huntsville, USA. <sup>2</sup>University of Kansas Medical Center, Kansas City, USA. <sup>3</sup>James A. Haley Veterans' Hospital, Tampa, USA.

## **P. 46 Diagnostic accuracy of a novel motor learning test for Alzheimer's disease screening**

Alexandra Reed<sup>1</sup>, Kevin Duff<sup>2</sup>, Lee Dibble<sup>3</sup>, Sydney Schaefer<sup>1</sup>  
<sup>1</sup>Arizona State University, Tempe, USA. <sup>2</sup>Oregon Health and Science University, Portland, USA. <sup>3</sup>University of Utah, Salt Lake City, USA.

## **P. 47 Metabolites of a Novel Asymmetric Walking Paradigm Using a Single Belt Treadmill**

Caitlin Banks<sup>1,2</sup>, Brooke Hall<sup>1</sup>, Junyao Li<sup>2,3</sup>, Jan Stenum<sup>2</sup>, Ryan Roemmich<sup>1,2</sup>  
<sup>1</sup>Kennedy Krieger Institute, Baltimore, USA. <sup>2</sup>Johns Hopkins University School of Medicine, Baltimore, MD, USA. <sup>3</sup>Northwestern University Feinberg School of Medicine, Chicago, IL, USA.

## **P. 48 Developing Personalized Medicine Strategies to Increase Daily Steps for Veterans with Parkinson's Disease: A remote gamification intervention**

Kimberly Waddell<sup>1,2</sup>, S. Ryan Greysen<sup>1,2</sup>, Madison Smith<sup>2</sup>, Stephanie Wood<sup>2</sup>, James Morley<sup>1,2</sup>  
<sup>1</sup>University of Pennsylvania, Philadelphia, USA. <sup>2</sup>Crescenz VA Medical Center, Philadelphia, USA.

## **P. 49 When complexity doesn't equal specificity: The utility of the Boston Qualitative Scoring System for the Rey-Osterrieth Complex Figure in detecting right hemisphere stroke**

Kasey Stack, Sarah Haile, Anna Seydell-Greenwald  
Georgetown University Medical Center, Washington, DC, USA.

## **P. 50 Scalability of Asymmetric Gait Changes Induced by a Dynamic Treadmill Controller**

Brooke Hall<sup>1</sup>, Caitlin Banks<sup>1,2</sup>, Ryan Roemmich<sup>1,2</sup>  
<sup>1</sup>Kennedy Krieger Institute, Baltimore, USA. <sup>2</sup>Johns Hopkins University School of Medicine, Baltimore, USA.

## **P. 51 Cardiorespiratory fitness does not protect against changes in manual dexterity over two years in persons with multiple sclerosis (MS)**

Sarah Duraid, Basel Mohamed, Nick Bray, Michelle Ploughman  
Memorial University of Newfoundland and Labrador, St. John's, Canada.

## **P. 52 The link between reward and movement during a music task: effects of musical composition and preliminary fMRI findings among stroke survivors**

Anna Palumbo<sup>1</sup>, Eva Luna Munoz Vidal<sup>1</sup>, Karleigh Groves<sup>1</sup>, Alan Turry<sup>1</sup>, Robert Codio<sup>1</sup>, Heidi Schambra<sup>2</sup>, Gerald Voelbel<sup>1</sup>, Pablo Ripolles<sup>1</sup>  
<sup>1</sup>New York University, New York City, USA. <sup>2</sup>NYU Grossman School of Medicine, New York City, USA.

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**P. 53 Tactile Examination at the Upper Extremity in Individuals with Stroke: A Scoping Review for Neuroengineers**

Arco Paul1, Karan Nayak2, Lindsey Sydnor3, Nahid Kalantaryardebily3, [Kevin Parcetchi1](#), Daniel Miner1, Eileen Wafford2, Jane Sullivan2, Netta Gurari3  
1Radford University, Radford, USA. 2Northwestern University, Evanston, USA. 3Virginia Tech, Blacksburg, USA.

**P. 54 Feasibility of passively monitoring real-world mobility and interpersonal communication among individuals with stroke using smartphone technology**

[Grace Bellinger1](#), Julie DiCarlo2, Sydney McKiernan2, Jamie Nam1, Ryan Roemmich1,3, Carolee Winstein4, Lee Schwamm5, David Lin2,6  
1Johns Hopkins University School of Medicine, Baltimore, USA. 2Massachusetts General Hospital, Boston, USA. 3Kennedy Krieger Institute, Baltimore, USA. 4University of Southern California, Los Angeles, USA. 5Yale School of Medicine, New Haven, USA. 6Harvard Medical School, Boston, USA.

**P. 55 Operant Up-Conditioning of the Quadriceps Motor Evoked Torque as a Means to Improve Quadriceps Function after Anterior Cruciate Ligament Reconstruction**

[Kazandra Rodriguez](#), Riann Palmieri-Smith, Chandramouli Krishnan  
University of Michigan, Ann Arbor, USA

**P. 56 White matter disconnection predicts visually guided reaching performance in chronic stroke**

[Matthew Chilvers](#), Trevor Low, Sean Dukelow  
University of Calgary, Calgary, Canada.

**P. 57 Precision control of the non-dominant left hand depends on inhibition of dominant right hand mechanisms in the left superior parietal lobule**

[Taewon Kim1,2,3](#), Samah Gassass1, Ruiwen Chen1, Alex Carter1, Ian Dobbins1, Lei Liu1, Mark McAvoy1, Zhexion Sun1, Yong Wang1, Benjamin Philip1  
1Washington University School of Medicine, St. Louis, USA. 2The Pennsylvania State University, University Park, USA. 3Penn State College of Medicine, Hershey, USA.

**P. 58 Quantitative activity assessment becomes useful when targeted at the motor skill demands following peripheral nerve injuries in the upper extremity**

[Samah Gassass](#), Ruiwen Zhou, Hattori Robin, Lei Liu, Lisa Connor, Benjamin Philip  
Washington University in St. Louis, St. Louis, USA.

**P. 59 Altered cerebellar functional connectivity differentially affects reactive stability in cognitively intact versus impaired older adults**

[Jessica Pitts](#), Lakshmi Kannan, Rudri Purohit, Tanvi Bhatt  
University of Illinois Chicago, Chicago, USA.

**P. 60 Differences in motor recovery prediction based on lesion size using degree of corticospinal tract injury from acute stroke imaging**

[Alexander Brunfeldt](#), Andrew DeMarco, Matthew Edwardson  
Georgetown University Medical Center, Washington DC, USA.

**P. 61 Feasibility of a scalable, home-based, full-body training program in chronic stroke patients using the MindMotion GO**

[Spencer Arbuckle1](#), Anna Knill2,3, Gabriela Rozanski4, Jenna Tosto-Mancuso4, Anastasia Ford1, Louis Derungs1, Michelle Chan-Cortés1, David Putrino4, Meret Branscheidt2,5  
1MindMaze, Lausanne, Switzerland. 2ETH Zurich, Zurich, Switzerland. 3Lake Lucerne Institute, Vitznau, Switzerland. 4Icahn School of Medicine at Mount Sinai, New York, USA. 5Cerenzo, Weggis, Switzerland.

**P. 62 A data fusion approach to improve accuracy and robustness of home and community mobility assessment after stroke.**

[George Fulk1](#), Karen Klingman2, Emily Peterson1  
1Emory University, Atlanta, USA. 2Upstate Medical University, Syracuse, USA.

# POSTERS LISTING

**P. 63 Obstacle-crossing as Predictor of Future Fall Status after Stroke: Comparison of Three Obstacle conditions**

Prudence Plummer, Megan Schliep, Lina Jallad, Ehsan Sinaei

MGH Institute of Health Professions, Boston, USA.

**P. 64 Stroke impairs proactive balance control in response to predictable gait perturbations**

Tara Cornwell, James Finley

University of Southern California, Los Angeles, USA.

**P. 65 Time-series clustering using gait kinematics can distinguish between neurotypical controls and subgroups of gait behaviors post-stroke**

Andrian Kuch1, Alison McKenzie1, Nicolas Schweighofer2, James Finley2, Yuxin Wen1, Natalia Sánchez1

1Chapman University, Irvine, USA. 2University of Southern California, Los Angeles, USA.

**P. 66 Community Participation and Fear of Falling in Ambulatory Stroke Survivors After Hospital Discharge: A Pilot Study**

Lina Jallad, Megan Schliep, Ehsan Sinaei, Prudence Plummer

MGH Institute of Health Professions, Boston, USA.

**P. 67 Diffusion Tensor Imaging correlates with Fugl-Meyer but not gait speed or other measures of clinical gait performance in chronic stroke**

Jessica McCabe1, Ahlam Salameh1,2, Sarah Carr3, Kelsey Rose Duncan4, Margaret Skelly1, Trenley Anderson5, Pragna Iyengar5, Lisa Leonhart1, Terri Hise1, Svetlana Pundik1,5

1Cleveland VA Medical Center, Cleveland, USA. 2Kent State University, Kent, USA. 3King's College London, London, United Kingdom. 4University Hospitals of Cleveland, Cleveland, USA. 5Case Western Reserve University School of Medicine, Cleveland, USA.

**P. 68 Stance-phase-targeted gait training can improve lower limb function with a 10-session protocol**

Lisa Leonhardt1, Jessica McCabe1, Margaret Skelly1, Ahlam Salameh1,2, Kelsey Rose Duncan3, Terri Hise1, Elizabeth Hardin van den Bogert1, Svetlana Pundik1,4

1Cleveland VA Medical Center, Cleveland, USA. 2Kent State University, Kent, USA. 3University Hospitals of Cleveland, Cleveland, USA. 4Case Western Reserve University School of Medicine, Cleveland, USA.

**P. 69 Bi-hemispheric tDCS Paired with Contralaterally Controlled Functional Electrical Stimulation(CCFES) for Chronic Stroke Motor Recovery: A Study Protocol for a Randomized Controlled Trial**

David Cunningham1,2,3, Patrick Tomko1,2, Rifeng Jin 1,2, Shreya Ramani1,2, Amy Fried1,2, Shannon Hogan2, Terri Hise1,2, Doug Gunzler1,2, Richard Wilson1,2, Jayme Knutson1,2,3

1Case Western Reserve University, Cleveland, USA. 2MetroHealth Center for Rehabilitation Research, Cleveland, USA. 3Functional Electrical Stimulation Center, Cleveland, USA.

**P. 70 Overground slip-perturbation training among people with stroke: Associations between long-term retention of reactive balance control and physical activity and balance confidence**

Rudri Purohit1, Shuaijie Wang1, Shamali Dusanee2, Rachana Gangwani3, Tanvi Bhatt1

1The University of Illinois at Chicago, Chicago, USA. 2Northwestern University, Chicago, USA. 3The University of North Carolina at Chapel Hill, USA.

**P. 71 Overall gait asymmetry is associated with the metabolic cost of walking in individuals with chronic stroke**

Amelia Cain1, Sarah Kettlety1, Natalia Sánchez2, James Finley1, Kristan Leech1

1University of Southern California, Los Angeles, USA. 2Chapman University, Irvine, USA.

**P. 72 The Influence of Risk on Decision-Making during Walking**

Shreya Jain, Nicolas Schweighofer, James Finley

University of Southern California, Los Angeles, USA.

**P. 74 Electrocortical dynamics during post-stroke gait: a preliminary analysis**

Chang Liu1, Teng Peng1, Dorian Rose1,2,3, Daniel Ferris1

1University of Florida, Gainesville, USA. 2Brooks Rehabilitation, Jacksonville, USA. 3Malcolm Randall Veterans Affairs Medical Center, Gainesville, USA.

**P. 76 Determining the role of sensory circuits for neurorehabilitation targeting after pediatric brain injury**

Michelle Corkrum, Tong Wen, Jason Carmel

Columbia University, New York, USA.



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Poster Reception II - Friday, April 12, 6:00-8:00pm - Even-numbered posters

## **P. 77 A Double-Blinded, Randomized, Sham-Controlled Trial of Vagus Nerve Stimulation Paired with Rehabilitation to Enhance Upper Limb Recovery after Spinal Cord Injury**

Emmanuel Adehunuoluwa<sup>1,2</sup>, Joseph Epperson<sup>1,3</sup>, Kaitlyn Malley<sup>1,2</sup>, Joel Wright<sup>1</sup>, Rachael Hudson<sup>1,2</sup>, Saeid Kian<sup>1,2</sup>, Jaime Gillespie<sup>4</sup>, Christie Stevens<sup>4</sup>, Danna Arnold<sup>4</sup>, Chad Swank<sup>4</sup>, Richard Naftalis<sup>4</sup>, Michael Foreman<sup>4</sup>, Rita Hamilton<sup>4</sup>, David Pruitt<sup>1</sup>, Jane Wigginton<sup>1</sup>, Amy Porter<sup>1</sup>, Seth Hays<sup>1,3</sup>, Robert Rennaker<sup>1,2</sup>, Michael Kilgard<sup>1,2</sup>  
<sup>1</sup>Texas Biomedical Device Center, University of Texas at Dallas, Richardson, USA. <sup>2</sup>School of Behavioral and Brain Sciences, University of Texas at Dallas, Richardson, USA. <sup>3</sup>Erik Jonsson School of Engineering and Computer Science, University of Texas at Dallas, Richardson, USA. <sup>4</sup>Baylor Scott & White Institute for Rehabilitation, Dallas, USA.

## **P. 78 Race/ethnicity and physical activity in stroke survivors**

Balsam J Alammari, Neva Kirk-Sanchez, Eduard Tiozzo, Marti Flothmann, Tatjana Rundek, Sebastian Koch, Lauri Bishop  
University of Miami, Coral Gables, USA.

## **P. 79 Effect of task-oriented arm training in standing on bimanual and unimanual arm use in stroke: a preliminary study**

Rushali Pandya<sup>1</sup>, Olivia Lockhart<sup>1</sup>, Allison Lewis<sup>2</sup>, Kathryn Maxwell<sup>1</sup>, Stacy Fritz<sup>1</sup>, Jill Stewart<sup>1</sup>  
<sup>1</sup>University of South Carolina, Columbia, USA. <sup>2</sup>Medical University of South Carolina, Charleston, USA.

## **P. 80 Differential neural activations between mental imagery and action observation of slipping among healthy older adults.**

Rudri Purohit<sup>1</sup>, Jessica Pitts<sup>1</sup>, Lakshmi Kannan<sup>2</sup>, Tanvi Bhatt<sup>1</sup>  
<sup>1</sup>The University of Illinois at Chicago, Chicago, USA. <sup>2</sup>Northeastern University, Boston, USA.

## **P. 82 Rural Access to Pediatric Teleneuromodulation in the Home Setting**

Sam Nemanich<sup>1</sup>, Daniel Lench<sup>2</sup>, Preston Christopher<sup>3</sup>, Gwendolyn Nytes<sup>4</sup>, Chrysanthy Ikonomidou<sup>5</sup>, Melissa Villegas<sup>6</sup>, Bernadette Gillick<sup>3,4</sup>  
<sup>1</sup>Marquette University, Milwaukee, USA. <sup>2</sup>Medical University of South Carolina Department of Neurology, Charleston, USA. <sup>3</sup>University of Wisconsin - Madison Waisman Center, Madison, USA. <sup>4</sup>University of Wisconsin - Madison School of Medicine and Public Health, Madison, USA. <sup>5</sup>University of Wisconsin - Madison Pediatric Neurology, Madison, USA. <sup>6</sup>University of Wisconsin - Madison Pediatric Rehabilitation Medicine, Madison, USA.

## **P. 83 Conceptualizing Gait Initiation in Parkinson's Disease using Linear Mixed Models**

Jessica Bath, Kenneth Louie, Jannine Balakid, Hamid Fekri Azgomi, Doris Wang  
University of California, San Francisco, San Francisco, USA.

## **P. 84 A single-session of Corsi Block Tapping Task training does not improve visuospatial skills in people with chronic stroke**

Giuliet Kibler<sup>1</sup>, Christina Holl<sup>1</sup>, Sarah Kettlety<sup>1</sup>, Sydney Schaefer<sup>2</sup>, Kristan Leech<sup>1</sup>  
<sup>1</sup>University of Southern California, Los Angeles, USA. <sup>2</sup>Arizona State University, Tempe, USA.

## **P. 85 Implicit locomotor learning and retention may not be related to cognition in post-stroke individuals**

Sylwia Lipior, Morgan Kelly, Amelia Cain, Kristan Leech  
University of Southern California, Los Angeles, USA.

## **P. 86 Disproportionate deficits in spatial working memory compared to verbal working memory in adults with chronic right hemisphere stroke**

Sarah Haile, Kasey Stack, Anna Seydell-Greenwald  
Georgetown University Medical Center, District of Columbia, USA.

## **P. 87 Biopsychosocial factors and cognitive reserve predict return-to-work or disability after stroke**

Caitlin Dulay<sup>1</sup>, Veronica Burton<sup>2</sup>, Mario Dulay<sup>2,3</sup>, Timea Hodics<sup>2</sup>  
<sup>1</sup>Texas A & M University, College Station, USA. <sup>2</sup>Houston Methodist Neurological Institute, Houston, USA. <sup>3</sup>The Houston Institute for Neuropsychological Knowledge (THINK) lab.

# POSTERS LISTING

## **P. 88 Understanding the influence of action observation on error reduction during movement in stroke**

Layla Abdullatif1, Maria Lindsey1, Veronica Rowe2, Lewis Wheaton1

1Georgia Institute of Technology, Atlanta, USA. 2Georgia State University, Atlanta, USA.

## **P. 89 Characterization of bilateral reaching abilities in typically developing children using computer vision and augmented reality assessments**

Shelby Ziccardi, Stephen Guy, Rachel Hawe

University of Minnesota, Minneapolis, USA.

## **P. 90 Home-based, Wearable Myoelectric Interface for Neurorehabilitation (MINT) Conditioning to Improve Arm Function in Chronic Stroke: A Randomized Controlled Trial**

Abed Khorasani1, Vivek Paul1, Cynthia Gorski1, Joel Hulsizer1, Prashanth Prakash1, Marc Slutzky1,2,3,4

1Department of Neurology, Northwestern University, Chicago, USA. 2Department of Physical Medicine & Rehabilitation, Northwestern University, CHICAGO, USA. 3Department of Neuroscience, Northwestern University, CHICAGO, USA.

4Department of Biomedical Engineering, Northwestern University, CHICAGO, USA.

## **P. 91 A randomized, double-blind, placebo-controlled study of ReStore, a novel implantable vagus nerve stimulator for stroke recovery**

Joseph Epperson1, Amy Porter1, Emmanuel Adehunoluwa1, Holle Gallaway1, Nate Bleker1, Michael Foreman2, Richard Naftalis2, David Pruitt1,3, Katharine Wigginton1,3, Chad Swank2,3, Christie Stevens2, Jaime Gillespie2, Danae Arnold2, Rita Hamilton2, Jane Wigginton1, Joel Wright1, Rachael Hudson1,3, Michael Kilgard1,3, Seth Hays1,3, Robert Rennaker1,3

1Texas Biomedical Device Center, Richardson, USA. University of Texas at Dallas, Richardson, USA. 2Baylor Scott and White, Dallas, USA. 3University of Texas at Dallas, Richardson, USA.

## **P. 92 Investigating the lateralized role of posterior parietal cortex for fine motor control during a tablet-based tracing task using HD-tDCS**

Sydney Sharp, Jessica Manning, Brooke Dexheimer

Department of Occupational Therapy, Virginia Commonwealth University, Richmond, USA.

## **P. 93 Accuracy of the Berg Balance Scale, Functional Gait Assessment, and Mini-BESTest for Predicting Future Post-stroke Fallers at Discharge from Inpatient Rehabilitation**

Ehsan Sinaei, Lina Jallad, Megan Schliep, Prudence Plummer

MGH Institute of Health Professions, Boston, USA.

## **P. 94 Corticospinal contribution to the control of bilateral intermuscular coordination in healthy and post-stroke subjects**

Shiva Nouri1,2, Ti-No Ho2,3, Carl Tchoumi1,2, Anatol G. Feldman2,3, Mindy F. Levin1,2

1McGill University, Montreal, Canada. 2Centre for Interdisciplinary Research in Rehabilitation, Montreal, Canada.

3University of Montreal, Montreal, Canada.

## **P. 95 Conversion from MEP- to MEP+ relates to upper extremity dexterity improvements after acute neurologic injury: a case study of recovery from cervical spinal cord injury due to meningitis-induced tonsillar herniation**

Kristi Emerson1, Sydney McKiernan1, Kelly Rische1,2,3, Sara Cavanagh1,2,4, Josephine Buclez1, Maria Nazarova5, Isha Vora6, Denis Balaban1, Teresa Kimberley6, Ziv Williams1, Leigh Hochberg1,2,7, David Lin1

1Massachusetts General Hospital, Boston, USA. 2Veterans Affairs Providence Healthcare System, Providence, USA.

3Medical University of South Carolina, Charleston, USA. 4Harvard John A Paulson School of Engineering and Applied Sciences, Cambridge, USA. 5Aalto University, Espoo, Finland. 6MGH Institute of Health Professions, Boston, USA.

7Brown University, Providence, USA.

## **P. 96 Sharing and aggregation of transcranial magnetic stimulation (TMS) derived data through common data elements: Improved functionality of the TMS Analysis Toolbox**

Patrick Tomko1,2, Rifeng Jin1,2, Shreya Ramani1,2, David Cunningham1,2,3

1Case Western Reserve University, Cleveland, USA. 2MetroHealth Center for Rehabilitation Research, Cleveland, USA.

3Cleveland Functional Electrical Stimulation Center, Cleveland, USA.

## **P. 97 Assessing Spinal Reflex Excitability of Post-Stroke Stiff-Knee Gait During Locomotion**

J. Sebastian Correa1,2, Ricardo Siu1,2, Shreya Ramani1,2, David Cunningham1,2, James Sulzer1,2

1Case Western Reserve University, Cleveland, USA. 2The MetroHealth System, Cleveland, USA.

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## **P. 99 Efficiency of unimanual dexterous performance and task factors influence arm nonuse in chronic stroke survivors**

[Shauna Zodrow](#)<sup>1</sup>, Brandon Knight<sup>1</sup>, Shailesh Kantak<sup>1,2</sup>, Laurel Buxbaum<sup>1</sup>

<sup>1</sup>Moss Rehabilitation Research Institute, Thomas Jefferson University, Elkins Park, USA. <sup>2</sup>Department of Physical Therapy, Arcadia University, Glenside, USA.

## **P. 100 Assessing Physical Activity Levels and Sedentary Behavior of Stroke Survivors living in the US-Mexican Border: a mix-method pilot study**

Leonardo Teixeira Tomé da Silva<sup>1</sup>, Jessica Hoffman<sup>1</sup>, Angel Melendez<sup>1</sup>, Adrian Chavarria<sup>1</sup>, Lindy Miller<sup>1</sup>, Taylor Chevallier<sup>1</sup>, Georgina Sanchez-Garcia<sup>1</sup>, Ana Jéssica Pinto<sup>2</sup>, Janaine Poleso<sup>3</sup>, [Camila Torriani-Pasin](#)<sup>1</sup>

<sup>1</sup>The University of Texas at El Paso, El Paso, USA. <sup>2</sup>University of Colorado Anschutz Medical Campus, Denver, USA. <sup>3</sup>Universidade Federal de Minas Gerais, Belo Horizonte, Brazil.

## **P. 101 Distinct Influence of Beta- and Gamma-tACS on Grip Force Regulation in Chronic Stroke**

[Syed Qadiri](#)<sup>1</sup>, Seraphina Culp<sup>2</sup>, Megan Grainger<sup>1</sup>, Peter Lum<sup>2</sup>, Shashwati Geed<sup>3</sup>

<sup>1</sup>MedStar National Rehabilitation Hospital, Washington, USA. <sup>2</sup>The Catholic University of America, Washington, D.C., USA. <sup>3</sup>The University of Texas at El Paso, El Paso, TX, USA.

## **P. 102 Soft wearable inflatable robot for supporting the shoulder improves arm function in people post-stroke**

[Prabhat Pathak](#)<sup>1</sup>, James Arnold<sup>1</sup>, John Paul Bonadonna<sup>1</sup>, Carolin Lehmacher<sup>1</sup>, Conor McCann<sup>1</sup>, Tanguy Lewko<sup>1</sup>, Sarah Cavanagh<sup>1,2,3</sup>, David Pont-Esteban<sup>1</sup>, Kelly Rische<sup>2,3,4</sup>, David Lin<sup>2,3</sup>, Conor Walsh<sup>1</sup>

<sup>1</sup>John A. Paulson School of Engineering and Applied Sciences, Harvard University, Cambridge, USA. <sup>2</sup>Department of Neurology, Division of Neurocritical Care and Stroke Service, Center for Neurotechnology and Neurorecovery, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA. <sup>3</sup>Department of Veterans Affairs, Rehabilitation Research and Development Service, Center for Neurorestoration and Neurotechnology, Providence, RI, USA. <sup>4</sup>Stroke Recovery Research Center, College of Health Professions, Medical University of South Carolina, Charleston, SC, USA.

## **P. 103 One-week test-retest reliability of an unsupervised, online version of the digit symbol modalities task among older adults**

[Andrew Hooyman](#)<sup>1</sup>, Kevin Duff<sup>2</sup>, Sydney Schaefer<sup>1</sup>

<sup>1</sup>Arizona State University, Tempe, USA. <sup>2</sup>Oregon Health and Science University, Portland, USA.

## **P. 104 Estimating Trunk and Forearm Movements in Healthy Controls and Patients with Unilateral Weakness due to recent Stroke using Wearable Sensors**

[Jack Pettit](#)<sup>1</sup>, Catherine Dang<sup>2</sup>, Paige Hepple<sup>1</sup>, Linda Riek<sup>3</sup>, Ania Busza<sup>1</sup>

<sup>1</sup>University of Rochester, Rochester, USA. <sup>2</sup>Vanderbilt University, Rochester, USA. <sup>3</sup>University of Nazareth, Rochester, USA.

## **P. 105 Motor Evoked Potential Operant Conditioning of Wrist Extensors in Individuals with Chronic Stroke: A Case Series**

[Blair Dellenbach](#)<sup>1</sup>, Manuel Portilla-Jiménez<sup>2</sup>, Allison Lewis<sup>1</sup>, Roland Cote<sup>1</sup>, Jinsook Roh<sup>2</sup>, Aiko Thompson<sup>1</sup>

<sup>1</sup>Medical University of South Carolina, Charleston, USA. <sup>2</sup>University of Houston, Houston, USA.

## **P. 106 Alterations in Brain White Matter Tract Integrity Across the Severity Spectrum in Chronic Stroke Survivors: A Tract-Based Spatial Statistics (TBSS) Analysis Approach**

[Jia Liu](#)<sup>1</sup>, Ken Sakaie<sup>1</sup>, Xin Li<sup>1</sup>, Kelsey Potter-Baker<sup>2</sup>, David Cunningham<sup>3</sup>, Mark Lowe<sup>1</sup>, Akhil Mohan<sup>1</sup>, Kyle O'Laughlin<sup>1</sup>, Morgan Widina<sup>1</sup>, Jayme Knutson<sup>3</sup>, Ela Plow<sup>1</sup>

<sup>1</sup>Cleveland Clinic, Cleveland, USA. <sup>2</sup>University of Texas Rio Grande Valley, Edinburg, USA. <sup>3</sup>MetroHealth Center for Rehabilitation Research, Cleveland, USA. Case Western Reserve University, Cleveland, USA.

## **P. 107 Pairing Intensive Training with Neuromodulation to Augment Hand Function in Persons with Hemiparesis**

[Susan Duff](#)<sup>1,2,3</sup>, Alison McKenzie<sup>1</sup>, Brooke Stein<sup>1</sup>, Bailey Advincula<sup>1</sup>, Isaac Ian<sup>1</sup>, Annie Jeon<sup>1</sup>, Casey McWilliam<sup>1</sup>, Will Potter<sup>1</sup>, Virginia Ruano<sup>1</sup>, Paulina Vokulich<sup>1</sup>, Rahul Soangra<sup>1</sup>

<sup>1</sup>Chapman University, Irvine, USA. <sup>2</sup>Rancho Research Institute, Downey, USA. <sup>3</sup>Cedar Sinai Medical Center, Los Angeles, USA.

# POSTERS LISTING

**P. 108 Exploring Machine Learning Approaches for Predicting Parkinsonian Gait: A Focus on Synthetic Minority Over-sampling Technique (SMOTE)**

Daniel Salinas, Gerardo Medelliñ, Katherine Bolado, Tomas Gomez, Dr. Nawaz Khan Abdul Hack, Dr. Ramu Vadukapuram, Dr. Igor Zwir, Dr. Kelsey Baker  
*University of Texas Rio Grande Valley, Edinburg, USA.*

**P. 109 Exploring reference frame utilization and aging effects in a traditional y-maze spatial navigation task**

Emily Cui<sup>1</sup>, Yasmine Bassil<sup>2</sup>, Michael Borich<sup>3</sup>  
*1Department of Neuroscience and Behavioral Biology, Emory University, Atlanta, USA. 2Neuroscience Graduate Program, Emory University, Atlanta, USA. 3Department of Rehabilitation Medicine, School of Medicine, School of Physical Therapy, Emory University, Atlanta, USA.*

**P. 110 Association of functional motor performance with hand muscle motor evoked potential post-stroke**

Jenna Blaschke<sup>1</sup>, Christian Schranz<sup>1</sup>, Ja'Quann Gallant<sup>1</sup>, Arianna Alston<sup>1</sup>, Na Jin Seo<sup>1,2</sup>  
*1Medical University of South Carolina, Charleston, USA. 2Ralph H. Johnson VA Healthcare System, Charleston, USA.*

**P. 111 Timing matters: Investigating the optimal period for baseline motor assessments in stroke recovery trials**

Sydney McKiernan<sup>1</sup>, Julie A. DiCarlo<sup>1</sup>, Jennifer D. Hebert<sup>1,2</sup>, Perman Gochyyev<sup>1,3</sup>, David J. Lin<sup>1,2</sup>  
*1Massachusetts General Hospital, Boston, USA. 2Veterans Affairs Providence Healthcare System Center, Providence, USA. 3Massachusetts General Hospital Institute of Health Professions, Boston, USA.*

**P. 113 Impacts of exoskeleton on movement characteristics during multi-directional reaching tasks in healthy adults**

Yi-Ning Wu, Hannah Allgood, Cooper Ferrari, Lian Orifice  
*University of Massachusetts Lowell, Lowell, USA.*

**P. 114 Proximal Upper Extremity Motor Control Analysis in Stroke Patients: A Comparative Study of Principal Component Analysis-Mahalanobis Distance (PCA-MD) and Dynamic Time Warping (DTW)**

Liqi Shui<sup>1</sup>, Sarah K. Cavanagh<sup>2,3,4</sup>, Perman Gochyyev<sup>5</sup>, Nicole Dusang<sup>6</sup>, Karen L. Furiel<sup>1</sup>, Dagmar Sternad<sup>7</sup>, Leigh Hochberg<sup>3,6,8</sup>, David J. Lin<sup>3,5,8</sup>  
*1Department of Neurology, Warren Alpert Medical School of Brown University, Providence, USA. 2Center for Neurotechnology and Neurorecovery, Department of Neurology, Massachusetts General Hospital, Harvard Medical School, Boston, USA. 3VA RR&D Center for Neurorestoration and Neurotechnology, Veterans Affairs Providence Healthcare System, Providence, USA. 4Harvard John A Paulson School of Engineering and Applied Sciences, Cambridge, USA. 5Department of Rehabilitation Sciences, MGH Institute of Health Professions, Boston, USA. 6Carney Institute for Brain Science and School of Engineering, Brown University, Providence, USA. 7Departments of Biology, Electrical and Computer Engineering, and Physics at Northeastern University, Boston, USA. 8Center for Neurotechnology and Neurorecovery, Department of Neurology, Massachusetts General Hospital, Harvard Medical School, Boston, USA.*

**P. 115 Influence of Participant Characteristics on Temporary Deafferentation Effectiveness to the Proximal Upper Limb**

Maria Lozano Bonilla, Hunter Butler, Jared Hensley, Daniel Salinas, Monica Lozano Garcia, Chelsea Erazo, Ashley Tijerina, Abdallah Gallah, Victoria Cuello, Kelsey Baker  
*University of Texas Rio Grande Valley School of Medicine, Harlingen, USA.*

**P. 116 Assessing Functional Connectivity and its Relationship to Functional Recovery Post-Stroke: Preliminary Findings from a Randomized Controlled Trial of Backwards Walking Training**

Dorian Rose<sup>1,2,3</sup>, Abigail Waters<sup>1,2</sup>, Kelly Hawkins<sup>1,2</sup>, Ronald Cohen<sup>1,2</sup>, John Williamson<sup>1,2</sup>  
*1Malcom Randall VAMC, Gainesville, USA. 2University of Florida, Gainesville, USA. 3Brooks Rehabilitation, Jacksonville, USA.*

**P. 117 Alteration in intermuscular coordination patterns after stroke varies depending on biomechanical conditions in the arm**

Manuel Portilla-Jiménez, Yoon N. G. Hong, Jinsook Roh  
*University of Houston, Houston, USA.*

**P. 118 Estimating the effect of age on one-year change in individual motor skill among a large, remote online cohort**

Andrew Hooyman, Sydney Schaefer  
*Arizona State University, Tempe, USA.*

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## **P. 119 Associations between neuroimaging predictors and changes in arm impairment in a phase 3 stroke recovery trial of vagus nerve stimulation**

Anne Schwarz<sup>1,2</sup>, Marc Feldman<sup>2</sup>, Vu Le<sup>1</sup>, Jesse Dawson<sup>3</sup>, Charles Y Liu<sup>4,5</sup>, Gerard E Francisco<sup>6,7</sup>, Steven L Wolf<sup>8</sup>, Anand Dixit<sup>9</sup>, Jen Alexander<sup>3</sup>, Rushna Ali<sup>10</sup>, Benjamin L Brown<sup>11</sup>, Wuwei Feng<sup>12</sup>, Louis DeMark<sup>13</sup>, Leigh R Hochberg<sup>14,15,16</sup>, Steven A Kautz<sup>17,18</sup>, Arshad Majid<sup>19,20</sup>, Michael W O'Dell<sup>21</sup>, Jessica Redgrave<sup>19</sup>, Duncan L Turner<sup>22</sup>, Teresa J Kimberley<sup>23</sup>, Steven C. Cramer<sup>1</sup>, 2

1Department of Neurology, David Geffen School of Medicine at UCLA, Los Angeles, USA. 2California Rehabilitation Institute, Los Angeles, USA. 3Institute of Cardiovascular and Medical Sciences, College of Medical, Veterinary and Life Sciences, University of Glasgow, Glasgow, United Kingdom. 4USC Neurorestoration Center and Department of Neurological Surgery, USC Keck School of Medicine, Los Angeles, USA. 5Rancho Los Amigos National Rehabilitation Center, Downey, USA. 6Department of Physical Medicine and Rehabilitation, The University of Texas Health Science Center McGovern Medical School, Houston, USA. 7The Institute for Rehabilitation and Research (TIIRR) Memorial Hermann Hospital, Houston, USA. 8Department of Rehabilitation Medicine, Division of Physical Therapy, Emory University School of Medicine, Atlanta, USA. 9Stroke Service, The Newcastle Upon Tyne Hospitals National Health Service Foundation Trust, Newcastle, United Kingdom. 10Department of Neurosurgery, Mayo Clinic, Rochester, USA. 11Department of Neurosurgery, Ochsner Neuroscience Institute, Covington, USA. 12Department of Neurology, Duke University School of Medicine, Durham, USA. 13Brooks Rehabilitation, Jacksonville, USA. 14Department of Neurology, Center for Neurotechnology and Neurovocery, Massachusetts General Hospital, Harvard Medical School, Boston, USA. 15School of Engineering and Carney Institute for Brain Science, Brown University, Providence, USA. 16VA RR&D Center for Neurorestoration and Neurotechnology, VA Medical Center, Providence, USA. 17Ralph H Johnson VA Medical Center, Charleston, USA. 18Department of Health Sciences and Research, Medical University of South Carolina, Charleston, USA. 19Sheffield Institute for Neurological Sciences (SITraN), Sheffield, United Kingdom. 20Sheffield Teaching Hospitals National Health Service Foundation Trust, Sheffield, United Kingdom. 21Clinical Rehabilitation Medicine, Weill Cornell Medicine, New York City, USA. 22School of Health, Sport and Bioscience, University of East London, London, United Kingdom. 23Department of Physical Therapy, MGH Institute of Health Professions, Boston, USA.

## **P. 120 Spontaneous Movements and Cortical Activity during Early Infancy**

Xiwen Su, Hyun Joon Kim, Evan Yarnall, Marie Kelly, Claudio Ferre  
Boston University, Boston, USA.

## **P. 122 Corticomuscular connectivity after rehabilitation training in subacute stroke**

Soha Salehi<sup>1</sup>, Michael Glassen<sup>1</sup>, Gregory Ames<sup>2</sup>, Kiran Karunakarn<sup>2</sup>, Karen Nolan<sup>2</sup>  
1Rutgers University, Newark, USA. 2Kessler Foundation, West Orange, USA.

## **P. 123 A Review of Post-Stroke Motor Fatigability**

Adarsh Mavathaveedu<sup>1</sup>, Paige Hepple<sup>2</sup>, David Cunningham<sup>3</sup>, Ania Busza<sup>2</sup>  
1University of Rochester Medical Center, Rochester, USA. 2Department of Neurology, University of Rochester, Rochester, USA. 3Department of Physical Medicine and Rehabilitation, Case Western Reserve University, Cleveland, USA.

## **P. 125 A Preliminary Study of Repetitive Grip Strength Testing in Subjects with Weakness due to Stroke.**

Klaury Youchom-Tagheui<sup>1</sup>, Adarsh Mavathaveedu<sup>2</sup>, Paige Hepple<sup>3</sup>, Ania Busza<sup>3</sup>  
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## **P. 126 Motor Control Abnormalities in the First 6 Months After Stroke – An Ongoing Longitudinal Study**

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## **P. 127 Between thinking and doing: Investigating the relationship between cognition and upper limb motor function after stroke**

Julie DiCarlo<sup>1,2</sup>, Abhishek Jaywant<sup>3</sup>, Sydney McKiernan<sup>1</sup>, Steven Cramer<sup>4,5</sup>, Nathan Ward<sup>2</sup>, David Lin<sup>1</sup>  
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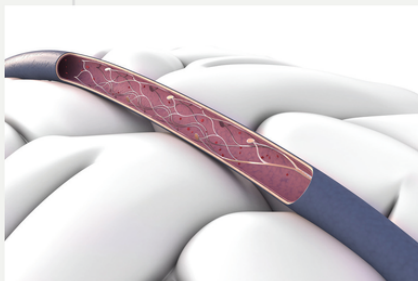
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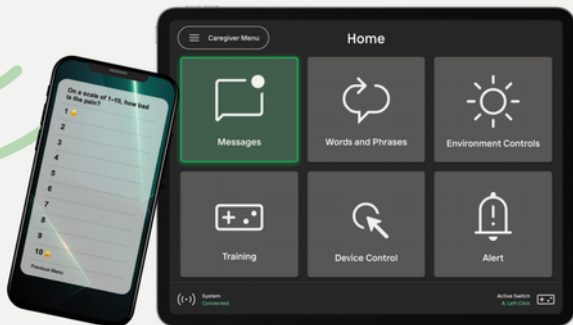


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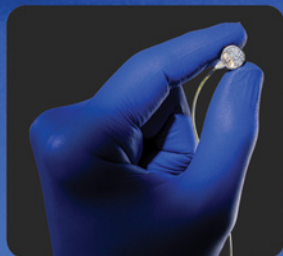
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