step count (primary outcome; actigraphy) will be continuously monitored during study participation. Secondary outcomes assess potential translation of the WEST intervention into conventional VA amputation care. IMPACT The unique rehabilitation paradigm in this trial addresses the problem of persistent sedentary lifestyles following lower-limb amputation through a telehealth self-management model. The novel transdisciplinary strategy will inform implementation potential, including a signal for clinical effectiveness.

**Day 2 Abstracts:**

**Keynote Presentation: Michael Boninger, Ph.D.**

**Building Innovative, Lasting, Interprofessional Teams: What I Have Learned from Others**

**Michael Boninger (University of Pittsburgh)**

The talk will focus on the core elements of building innovative, lasting, interprofessional teams. It will not only reflect my own experiences, but draw on the invaluable lessons learned from my colleagues in rehabilitation research. In addition to insights on team building, the talk will showcase key findings of my colleagues; key findings that were make possible because of their ability to lead and work as a part of team.

**Session 6: Augmented Therapy—Rehabilitation Technology**

**Cross-disciplinary study of the neural basis of rehabilitation outcomes with virtual reality: a preliminary investigation**

**Neha Mehta (New York University), Rory O'Keeffe, Yair Shahar, Sarmad Mehrdad, Farokh Atashzar, Anat Lubetzky**

Virtual Reality (VR) is increasingly gaining traction as an innovative solution to enhance rehabilitation outcomes by providing a conducive environment for engaging and customizable physical activity. To harness the benefits of such technologies, it is imperative to understand their interaction at the neural level. Therefore, as a first step, we utilized Electroencephalography (EEG) to investigate the spatiotemporal dynamics of the brain in young adults with and without VR immersion. Five healthy young adults (4 males) performed boxing exercises guided by either a 3D VR-based game or an instructional video displayed on a 2D computer screen. A 64-channel EEG was recorded during 3 graded task intensity levels: (i) rest, (ii) moderate, and (iii) advanced. We calculated the mean power spectral density in the 20-100 Hz range as a proxy to the level of activation for each EEG channel. Median cortical activation in each pre-frontal, frontal, parietal, and occipital region increased in proportion to task intensity, both with and without VR. The overall cortical activation was higher with VR versus instructional video for advanced-intensity tasks ($p<0.001$). Higher cortical activation indicates an underlying ion flow gradient for synaptic transmission, suggesting some neuroplastic changes during VR immersion. In this presentation, we will cover the implications of emerging results from the ongoing pilot randomized crossover study. We will discuss the rational for methodologies that combine VR headsets and EEG and our choice of outcome measures. This line of research holds significant potential to explain the effectiveness of VR and facilitate rehabilitation research and clinical translation.

**The WeeBot: Development of a Unique Powered Mobility Device for Very Young Infants through Transdisciplinary Collaboration**

**Sharon Stansfield (Ithaca College), Carole Dennis**

In this presentation we will discuss the transdisciplinary research approach used to develop a powered mobility device for infants and why collaborations between technologist and clinicians should start early, and on the clinical side. The WeeBot is a powered mobility device shown to provide independent, hands-free, and self-directed movement to infants as young as 6 months old. The control method is innovative: The device moves in the direction that the child leans, making it a more intuitive device than anything currently available. Additional safety features reduce the risks inherent in providing powered mobility to infants this young. The origin of the WeeBot as a research project began with a collaboration between a pediatric Occupational Therapist whose experience in early intervention provided the unsolved problem Roboticist with an interest in solving real world problems. Providing mobility is now viewed as a beneficial aspect of therapy, but the general approach is "movement for movements sake". The WeeBot team which had added a Pediatric Physical Therapist and Development Psychologist, believed that movement with purpose was the key to gains in future milestones. Current technologies struggle to provide this — most infants can't fully control devices that use joysticks/switches. The technologist understanding the problem but not bound by disciplinary history, could provide a unique perspective on the a solution and hence the WeeBot came to be. A start-up company, Assistance in Motion, founded by the core of the research team is now working to commercialize and make this device available to clinicians and parents.

**Learning to Explore and Exploring to Learn: Understanding Powered Mobility Use in Toddlers with Disabilities**

**Kimberly Ingraham (University of Washington), Heather Feldner, Katherine Steele**

For toddlers with disabilities, powered mobility technology can be a powerful tool to facilitate self-initiated exploration and social engagement in home, community, and clinical environments. However, despite overwhelming evidence that access to independent mobility is critical for early development, access to powered mobility for toddlers with disabilities is significantly limited. New devices, such as the Permobil Explorer Mini, have recently made it easier and safer to provide powered mobility options for young children with disabilities at appropriate developmental stages. Yet, many open questions remain surrounding how toddlers learn to use these devices, how powered mobility can support development, and how we should design powered mobility interventions. Our transdisciplinary team of engineers, clinician scientists, and rehabilitation professionals has investigated how toddlers with disabilities use powered mobility for self-directed play and rehabilitation across a spectrum of environments: in the lab, at home, and in the clinic. We will discuss quantitative and qualitative results from our recent Explorer Mini experiments with over 35 children with diverse developmental disabilities, including device use patterns, developmental outcomes, and the perceptions of caregivers and rehabilitation professionals. We found that after 16 weeks of using powered mobility at home, there were significant improvements in the Bayley IV across all domains. In the lab, we demonstrated that on average, kids move a distance of 52 meters in a 15-minute play session. These results support our long-term goal of building the scientific foundation needed to foster the translation of clinically impactful mobility technologies for infants and toddlers with disabilities.