participants’ interviews supported the use of ESM within the constraints and designs utilized in this study.

Key Words: Aphasia, Stroke, Brain Injury
Disclosures: None disclosed.

Research Poster 375
Clinician Competency with Wheelchair Maintenance and the Efficacy of a Wheelchair Maintenance Training Program

Lynn Worobey (Human Engineering Research Laboratories), Jonathan Pearlman, Trevor Dyson-Hudson, Michael Boninger

Research Objectives: To investigate clinician competency with wheelchair maintenance and evaluate the efficacy of an in-person wheelchair maintenance training program for both manual and power wheelchairs. We hypothesized a priori that participants would have deficient areas of capacity (“can you perform the task?”) and training (“do you train wheelchair users in the task?”) as measured by the Wheelchair Maintenance Training Questionnaire (WMT-Q) and that capacity would increase following training.

Design: Prospective cohort.
Participants: Convenience sample of fifteen clinicians interested in training wheelchair users with spinal cord injury in wheelchair maintenance.
Interventions: Two content experts provided a 1-day training session at each Center with PowerPoint presentation, video, and hands-on practice. Each clinician received a reference manual, reminder cards and a toolkit.
Main Outcome Measure(s): Wheelchair Maintenance Questionnaire (WMT-Q) at baseline and one week after training.
Results: Clinicians had an average of 4.0±6.4 years of experience, with an average 30% of the sample reporting they provided wheelchair maintenance training to wheelchair users as a regular part of their provision process. At baseline clinicians were deficient in 75% of the maintenance tasks on the WMT-Q with an average total score of 48.4%. The majority of clinicians were not aware of how to check spokes on a manual wheelchair, lubricate moving parts, clean an axle housing or check whether power wheelchair brakes were working correctly. Following training, clinicians improved in WMT-Q (p=0.007) with a mean score of 100%.
Conclusions: Baseline WMT-Q scores show a deficiency in clinician knowledge and training of end users in maintenance. Our training program can increase clinician capacity to perform wheelchair maintenance.
Key Words: Wheelchair, maintenance, clinician, training
Disclosures: None disclosed.

Research Poster 381
Disease Burden in Saudi Arabia Compared to the USA- as Measured by the Short Form 36 (SF36v2) Health Survey

Ahmed Aboabat (King Fahad Medical City), Ahmed Aboabat, Jakob Bue Borjner, Hazem Qannam

Research Objectives: To evaluate disease burden in Saudi Arabia compared with the USA for seven chronic conditions of interest for physical rehabilitation: heart disease (HD), chronic obstructive pulmonary disease (COPD), stroke, arthritis, back problems (BP), chronic fatigue (CF), and limitations in use of arms or legs (LAL).

Design: Data on the 7 chronic conditions and SF36v2 scores was collected from general population samples by personal interviews (Saudi Arabia), web and paper& pencil questionnaires (USA).

Setting: General population (Saudi Arabia).
Participants: Saudi Arabia: 4805 participants age 16-82 (median age 28), 59% female. USA: 4040 participants age 18-101 (median age 52), 51% female.
Interventions: Not applicable.
Main Outcome Measure(s): Disease burden for each chronic condition was assessed by decrements in the SF36v2 physical health component summary score (PCS) compared to the general population. All analyses controlled for differences in age and gender.
Results: In Saudi Arabia, disease burden ranged from a PCS decrement of 12.5 (95% CI = 9.4-15.5) for LAL to a decrement of 5.6 (95% CI = 2.4-9.9) for COPD. In the USA, disease burden ranged from a PCS decrement of 13.8 (95% CI = 12.9-14.8) for LAL to a decrement of 5.8 (95% CI = 5.0-6.7) for HD. Four conditions (COPD, arthritis, BP, and CF) showed significantly (p<0.0001) larger disease burden in the USA than in Saudi Arabia.
Conclusions: Results about the magnitude of disease burden may not generalize from the USA to countries with very different demographics, diagnostic practices, physical or cultural conditions.
Key Words: Quality of life, Chronic disease, Cross-cultural comparison, Saudi Arabia
Disclosures: None disclosed.

Research Poster 382
Functional and Structural Neural Patterns in Mild-Moderate Chronic-Phase Traumatic Brain Injury

Matthew J. Kmieciik (The University of Texas at Dallas, Center for BrainHealth®), David Martinez, Leanne R. Young, Sandra Chapman, Daniel C. Krawczyk

Research Objectives: To investigate the relationship between white matter microstructure and functional blood oxygenation level dependent (BOLD) response in mild-moderate chronic-phase traumatic brain injury (TBI) and how this relationship relates to different mechanisms of injury using the multivariate technique of partial least squares correlation.

Design: Randomized intervention study of an experimental cognitive training program and a control program; analysis focused on pre-treatment neural measures and did not investigate intervention effects, but rather offered insight on the relationship between brain structure and function in a TBI sample.

Setting: The University of Texas at Dallas, Center for BrainHealth®.
Participants: Thirty-six mild-to-moderate chronic-phase TBI participants with minimal comorbidities and the following mechanisms of injury: blast, blunt force trauma, fall, sports, vehicular accident, multiple injuries, and non-impact related damage.

Interventions: Not Applicable.

Main Outcome Measure(s): Fractional anisotropy (FA) and mean diffusivity values were collected from diffusion tensor images and BOLD signal activations were obtained by functional magnetic resonance imaging scans during a working memory task.

Results: A partial least squares correlation analysis revealed positive relationships between task-related BOLD activations and FA values in white matter regions of interest. The strongest correlations were found in occipital, parietal, and cingulate cortical regions and differentiated injury mechanisms. Blast, vehicular, and sports injuries were associated with elevated FA and functional BOLD activations, whereas blunt force trauma, falls, and multiple injury types were more associated with reduced FA and functional BOLD activations.

Conclusions: These results suggest mechanisms of TBI injury may result in differential effects on the neural pathologies in both gray and white matter that go over and above traditional classifications of TBI severity in the chronic phase. Future work can be done to understand how different injury mechanisms and resulting neural pathologies impact cognitive abilities and improvements in TBI rehabilitation.

Key Words: Chronic-Phase Traumatic Brain Injury, Functional Magnetic Resonance Imaging, Diffusion Tensor Imaging, Partial Least Squares Correlation, TBI Injury Types
Disclosures: None disclosed.

Research Poster 383
Quantifying Therapist Practitioner Roles Using Video-based Analysis: Can We Reliably Model Therapist-Patient Interactions During Task-Oriented Therapy?

Rochelle Mendonca (Temple University), Michelle Jillian Johnson, Sarah Laskin, Luke Adair, Mayumi Mohan

www.archives-pmr.org
Research Objectives: To use behavior-based control principles to identify the typical roles and behaviors that a rehabilitation therapist and a patient with stroke adopt in a functional activity-based therapy session. This study aimed to recognize client behaviors that trigger a change in the role of therapist and to determine how the patient’s level of functioning and the task complexity affect the time spent in each role. These behavior-based codes are intended to be mapped over to robot-patient interactions in an activity-based intervention.

Design: Qualitative observation research.

Setting: Video-based analysis of stroke patient-therapist interactions.

Participants: Eight videos of a stroke patient and a rehabilitation therapist were evaluated qualitatively by two coders.

Interventions: Eight videos were analyzed of functional activities within the context of an occupational therapy session, utilizing Multimedia Video Task Analysis. Therapist and client roles and behaviors were coded.

Main Outcome Measure(s): Roles and physical and verbal behaviors by stroke patients and rehabilitation therapist during a functional activity intervention.

Results: Therapist typical roles included observer, helper, and demonstrator. Patient typical roles included observer, performer and performer with assistance. A patient’s level of functioning affected the role of the therapist. Coders identified twenty-eight client behaviors that led to therapist role changes. Twenty-four were physical and 4 were verbal behaviors. Key physical patient behaviors that triggered therapist roles changes were the client’s ability or inability to perform components of the activity. Verbal cues did not often cause a change in therapist role. Task complexity did not affect time spent in each role.

Conclusions: This study demonstrated that behavior based control principles can be successfully used to identify human-human interactions in activity-based therapy sessions.

Key Words: Rehabilitation, Stroke, Robotics

Disclosures: None disclosed.

Research Poster 391

Predictors of Daily Ambulation Activity Across the First Six Months Following Hospital Discharge

Niruthikha Mahendran (University of Canberra), Suzanne S. Kuys, Sandra G. Brauer

Research Objectives: To identify which factors at hospital discharge predicts ambulation activity outcome at one, three and six months following discharge from hospital after stroke.

Design: Prospective, observational study.

Setting: Community setting, Brisbane, Australia.

Participants: 36 stroke survivors (aged 71±10 years, 69% male), independent in gait, with no cognitive impairment.

Interventions: Nil.

Main Outcome Measure(s): Predictors collected at discharge included: gait speed and endurance; fatigue, mood, executive function, pre-stroke physical activity, ambulatory self-confidence, perceived health status and stroke impact. Accelerometer-derived measures of ambulation activity included: volume (total steps), frequency (total time spent in long intensity bouts, i.e. >300 steps), and intensity (total time spent in high intensity bouts, i.e. >80 steps/minute) per day at 1.3 and 6-months post-discharge. Predictors were entered into a step-wise regression model.

Results: Gait endurance alone predicted all ambulation activity at one month (R2 ≥ 0.29, p ≤ 0.005). At three months, both discharge gait endurance and pre-stroke physical activity predicted volume (R2 = 0.46, p = 0.001) and intensity (R2 = 0.61, p < 0.001) of ambulation activity, and pre-stroke physical activity alone predicted frequency of ambulation activity (R2 = 0.31, p = 0.004). At six months, age alone predicted volume (R2 = 0.35, p = 0.002) and frequency (R2 = 0.34, p = 0.003) of activity and a combination of pre-stroke activity, discharge gait endurance, and executive function predicted intensity of ambulation activity (R2 = 0.79, p < 0.001).

Conclusions: Gait endurance predicts ambulation activity outcomes across the first six months following hospital discharge after stroke, especially intensity. After one month, other factors such as pre-stroke activity, age and executive function contribute to ambulation activity outcomes.

Key Words: Stroke, Physical activity, Physical endurance

Disclosures: None disclosed.

Research Poster 393

Cognitive Training with Adaptive Motion-Based Video Games for Improving Executive Functions Following Acquired Brain Injury

Son Preminger (Intendu Ltd.), Rotem Eliav, Barak Blumenfeld, Yifat Swartz, Sivan Mazo, Debbie Rand, Yaron Sacher

Research Objectives: 1) To assess the experience of dynamically-adaptive motion-interaction video games for cognitive training and 2) to assess the potential benefits for improving Executive Functions (EF) following Acquired Brain Injury (ABI).

Design: This study has two stages: Stage I was a multi-session pilot and we are currently conducting stage II, a randomized control trial (RCT).

Setting: Lowenstein Rehabilitation Hospital Inpatient facility.

Participants: Four participants participated in multi-sessions (stage I).

To date, 10 participants with ABI with executive dysfunctions have completed the RCT and were randomly assigned to intervention (N = 5) or control group (N = 5).

Interventions: Participants experienced 4-6 sessions (stage I) or 9-10 sessions over 3 weeks period (stage II) of computerized training using motion-based adaptive video games designed to train behavioral control, initiation, working memory and attention (Intendu Functional Brain Trainer). Control group played commercial iPad games for the same duration.

Main Outcome Measure(s): Pilot group performed the BRIEF questionnaire (stage I). Stage II assessments pre and post intervention included the Dysexecutive Questionnaire (DEX), computerized neuropsychological assessments of EF (WebNeuro), the Executive Functions Performance Test (EFPT) and a satisfaction questionnaire.

Results: Intervention group was gradually able to perform games involving higher EF challenge. Task difficulty between first and last session was significantly higher and response time significantly decreased. Participants didn’t show adverse effects and reported of enjoyment and felt successful. Preliminary analysis of some functional and EF assessments shows trend of improvement for intervention group.

Conclusions: The potential of using motion-based adaptive cognitive training for individuals with ABI is demonstrated. Currently more participants are recruited for the RCT to assess effectiveness of this training for improving EF and facilitating transfer into everyday functioning.

Key Words: Executive Functions, Brain Injury, Cognitive Rehabilitation, Neuroplasticity

Disclosures: Dr. Son Preminger is the founder and CEO of Intendu the company that developed the software (in addition to her academic position at the Interdisciplinary Center at Herzliya). Dr. Barak Blumenfeld is the co-founder and CTO of Intendu the company that developed the software. All other authors have nothing to disclose.

Research Poster 394

Voxel Based Lesion-Symptom Brain Mapping (VLSM) Study of Swallowing Control in Stroke Patients

Soojin Jung (Department of Physical Medicine and Rehabilitation, Dongtan Sacred Heart Hospital, Hallym University College of Medicine), Ha Ra Jeon, Hea-Eun Yang, Si-Nae Kim, Ri-La Lim

Research Objectives: To investigate the brain lesion related to post stroke dysphagia using Voxel based lesion-symptom brain mapping (VLSM).

Design: Non randomized controlled trial.

Setting: Hospital-based rehabilitation center.

Participants: 50 participants who had stroke was included this study (M/F = 35:15, Mean Age 68.8 years (SD = 12.3)). 47 participants had ischemic stroke and 3 participants had hemorrhagic stroke.