

Research Day

FRIDAY
APRIL 13th

**CAROLE A. SULLIVAN ATRIUM
ROOMS 1117 & 1047
PERKINS AUDITORIUM, TULSA**

8:45 am - Dave Thompson, Ph.D., PT, Associate Professor of Biostatistics and Epidemiology (Emeritus)
"Searching for (and auto-refreshing) a mix of art and science over the clinical career"

10:00 am - Oral Presentations

12:00 pm - Poster Presentations

2:30 pm - Lab Tours

**The University of Oklahoma
Health Sciences Center
College of Allied Health**

A celebration of research in the practices of:

- Communication Sciences and Disorders
- Medical Imaging and Radiation Sciences
- Nutritional Sciences
- Rehabilitation Sciences

All faculty, students, staff and clinical educators are invited to attend
For accommodations on the basis of disability, please contact Jennifer at (405) 271-2288.

The University of Oklahoma is an equal opportunity institution www.ou.edu/eoo

8-8:30	Registration (OKC: Carole A Sullivan Atrium, Tulsa: Outside of Perkins Auditorium)		
8:30-8:45	Welcome address: Leah Hoffman and Dean Allen Knehans OKC Rooms: AHB 1117, 1046, 1047, 2058, 2059, 2065 Tulsa Rooms: Perkins Auditorium		
8:45-9:45	Keynote address: Dr. David Thompson PhD, PT Introduction by Jonathan Baldwin "Searching for (and auto-refreshing) a mix of art and science over the clinical career" OKC Rooms: AHB 1117, 1046, 1047, 2058, 2059, 2065 Tulsa: Perkins Auditorium		
9:45-10:00	Short break		
	Track 1 OKC: AHB 1117, 1046, 1047 Tulsa: LC138	Track 2 OKC: AHB 2058, 2059, 2065 Tulsa: Perkins Auditorium	Researcher-in-Training OKC: 2060 Tulsa: LC 137
10:00-10:50	Understanding Development of Disease Moderator: Jennifer Graef Thubi H. A. Kolobe: Electroencephalography and infant motor proficiency during development of prone locomotion Shivani Mann: Unraveling Underlying Mechanisms of 17 α -Estradiol Action and its Metabolic Benefits Jennifer Morrison: Estrogen Regulates Tight Junction Protein Expression in the Small Intestine	Development of Evidence-Based Practice Moderator: Andrew John Sarah Bulloch: Focal muscle vibration for post-stroke rehabilitation: A systematic review of protocols and outcomes Katie Blankenship: Does caregiver type relate to physical function of older adults in a skilled nursing facility? Hongwu Wang: Outcome measures used in acute care by occupational therapist	Researcher in Training Moderator: Susan Sisson The Future of Research A special Q & A panel with Vice President for Research James Tomasek and Graduate College Dean Anne Periera
10:50-11:00	Short break		
11:00-11:50	Environment and Pediatric Development Moderator: Christi Barbee Emily Readnour: The effects of socio-emotional wellbeing on motor performance in young infants Morgan Gilsinger (Tulsa): Effectiveness of attending a developmental preschool on children with developmental disabilities (Tulsa Moderator: Vince Lepak) Manroop Singh: The Effect of AAE Dialect Use on Assessments of Phonological Awareness in Preschool	Innovation in Clinical Interventions Moderator: Carole Johnson Jennifer Lynn (Tulsa): Instrumental Activities of Daily Living to Predict Independence after Traumatic Brain Injury (Tulsa Moderator: Mary Isaacson) Elizabeth Hile: Exercise adherence in a pilot randomized trial of prehabilitation before pancreaticoduodenectomy Suzanne Kimball: Hearing Aid Uptake in Severe Tinnitus Patients with Very Mild Loss	Researcher in Training Moderator: Anna Jilla Special presentation: Scientific Writing Kathy Kyler
12:00-1:30	Lunch (on your own) and poster sessions Poster session 1: 12:00-12:45 Poster session 2: 12:45-1:30		
1:30-2:20	Early Mobility & Robotic Movement Learning Moderator: Hongwu Wang Nana Twum-Ampofo: Integration of 3 Outcome Measures for Movement Learning in an Infant using the Self-Initiated Prone Progression Crawler-3 - Case Report Brooke Klaphake: Does frequency of arm and leg movements in infants influence goal directed movement in infants learning to crawl? Emily North: Fidelity in Research	Special Issues in Pediatrics Moderator: Katerina Ntourou Victoria Showalter: Speech-language pathologists' assessment practices for preschool age and early school age children who stutter Carlye Harris (Tulsa): Effectiveness of individualized sensory intervention on life performance for kids with sensory processing issues (Tulsa Moderator: Vince Lepak) Laura Ramseyer: Inter-Rater Reliability of the School Outcomes Measure (SOM): A Multisite Approach	Researcher in Training Moderator: Alex Mdzinarishvili Special presentation: Finding Funding for Student Research Jennifer Kirkwood
2:20-2:30	Short exit remarks and presentation of awards		
2:30-4:00	Lab tours		

Poster Session 1

11:30-12:15

Katie Blankenship: TREATING UPPER EXTREMITY HYPERTONICITY IN CHILDREN WITH CEREBRAL PALSY: A CRITICALLY APPRAISED TOPIC

Courtney Coon: WHOLE-BODY VIBRATION PROTOCOL AND OUTCOMES IN POST-STROKE REHABILITATION: A SYSTEMATIC REVIEW

Christina Crowder: THE EFFECTS OF A LOW-CARB, NON-KETOGENIC DIET VERSUS STANDARD DIABETES DIET ON GLYCEMIC CONTROL IN TYPE 1 DIABETES

Jonathan Day: Maximum End-Bearing after Transtibial Osteomyoplastic Amputation

Morgan Gilsinger: Self-Determination: Seeing With More Than Sight

Catherine Grantham: The Food Desert/Food Swamp Status Of Oklahoma Early Care And Education Environments

Cassie Hanna: The Effect of ADL Training on the Functional Independence of Older Adults with Deconditioning

Morgan Hill: Effectiveness of an Ototoxicity Inservice Training for Nursing Students

Vince Lepak: Effects of localized vibration on flexibility: a randomized control trial

MacGyver Norris and Kristen Faucett: A Fitness-Wellness Program for Children with Leukemia: A Case-Comparison-Control Study

Danielle Schlegel: Effectiveness of Occupational Therapy on Functional Independence Following Pediatric Neurological Injury

Kimberly Veirs: PERCEPTION OF DANCE-RELATED PAIN AND INJURY AND DANCERS' UTILIZATION OF ALLIED HEALTH PROFESSIONALS: SURVEY

Poster Session 2

12:15-1:00

Jilan Alturkistani: A Dosimetric evaluation of Volumetric Modulated Arc Therapy (VMAT) versus Three Dimension Conventional Therapy (3D CRT) for the treatment early stage lung cancer with Stereotactic Body Radiation Therapy (SBRT)

Hannah Blanden and Ashlee Lusch: EXPLAINING LACK OF PARTICIPATION IN HIGHER EDUCATION FOR YOUNG ADULTS WITH INTELLECTUAL OR DEVELOPMENTAL DISABILITIES

Lynn Jeffries: LONGITUDINAL TRAJECTORIES AND REFERENCE PERCENTILES OF IMPAIRMENTS IN CHILDREN WITH CEREBRAL PALSY

Lee Ann Fancher: HANDWIRING ACQUISITION AND INTERVENTION: A SYSTEMATIC REVIEW

Cassie Hanna: Determining the Effectiveness of Occupational Therapy Interventions with Patients Diagnosed with Deconditioning

Hannah Hoffman: Services in Greece

Sajad Jamali: Evaluating the Dosimetric Differences and Treatment Plan Qualities between Pinnacle's Auto-Planning vs. Manual Planning in Patients with Prostate Cancer

Jessica James: Children's and Young Adults' Sentence Recognition in Noise: Accuracy and Listening Effort

Neelie Kuchel: Whole brain irradiation for multiple brain metastases field arrangement to reduce parotid gland dose.

Alaina Nash and Cassandra Ward: Preposition Coding Conventions in the Calculation of Dialect Density for Young African American Children

Amber Rinestine: A Fitness-Wellness Program for Children with Leukemia and their Best Friends: A Case-Comparison-Control Study

Danielle Schlegel, Hailey Melton, Kera Parker, and Haylie Perry: Meaningful Employment for Adults with a Disability

Lab:	Faculty	Dept	Room number
Hearing Evaluation, Rehabilitation, and Outcomes Laboratory	Carole E. Johnson, PhD, AuD, CCC-A	CSD	2041
Child and Family Stuttering Research Lab	Katerina Ntourou, PhD, CCC-SLP	CSD	2074
3-Dimensional Printing Lab	Kari Boyce, PhD, & Bradford Gildon, MA, BSRT, RT	MIRS	1034
CT Lab	Jeff Berry, MS, RT (R) (CT)	MIRS	1036
Virtual Reality Radiation Therapy System	Stacy Anderson, MS., RT(T), CMD	MIRS	2038
Behavioral Nutrition & Physical Activity Lab	Susan B. Sisson, PhD, RDN, CHES, FACSM	NS	3121
Nutritional Basic Sciences Laboratory	Jennifer Graef, PhD, RD, & Michael Stout, PhD	NS	3150
Mechanical Therapy Research Laboratory, Center for Human Performance Measurement	Carol P. Dionne, PT, DPT, PhD, OCS, Cert MDT	RS	3020
Human Development Research Laboratory	Thubi H.A. Kolobe, PT, PhD, FAPTA	RS	3122
Stroke Research Lab	Alexander Mdzinarishvili, PhD	RS	1123
Technology for Occupational Performance	Hongwu Wang, PhD	RS	3158

College of Allied Health
Research Day 2018
Abstracts (in alphabetical order)

A Dosimetric Evaluation of (VMAT) Versus (3D CRT) for the Treatment of Non-Small Cell Lung Cancer with Stereotactic Body Radiation Therapy

J. Alturkistani¹

1. OUHSC College of Allied Health, Department of Medical Imaging and Radiation Sciences

Abstract

Background: SBRT has been introduced for early stage non-small cell lung cancer (NSCLC) due to excellent local control and few side effects. The efficiency of this technique lies on delivering high radiation doses per fraction. A recent study has shown that SBRT results in improved local control rates when compared to conventionally fractionated radiotherapy. This treatment can be achieved with different techniques including 3D-CRT, IMRT and VMAT.

Purpose: The purpose of this study was to compare radiation dose delivery in SBRT with 3D-CRT and VMAT. The comparison among all SBRT radiation techniques was performed to assess how much normal lung tissues would be exposed to radiation as well as to evaluate dose to organs at risks.

Methods and materials: This study involved the use of twenty-three (n=23) retrospective de-identified CT datasets with centrally located left side lung tumors. Four treatment plans were created for each CT dataset: (1) coplanar and (2) non-coplanar 3D CRT and VMAT such that 95% of planning target volume (PTV) received 100% of prescription dose 5500 cGy in 5 fractions. Beam angles and arc lengths were selected in order to attain the best dose coverage to the target volume as well as the lowest dose to the organs at risks. Maximum doses to the heart, ribs, lungs, and esophagus were compared among planning techniques using repeated measures ANOVA with a Tukey adjustment for multiple comparisons. All tests assume a 5% chance of a type one error.

Results: All four planning methods had comparable maximum doses in the lungs and esophagus. ($p < 0.05$ for all) additionally, the maximum dose to the heart was comparable among the 3DCRT non-coplanar, 3DCRT Coplanar, and VMAT planning methods. ($p = 0.0613$, $p = 0.1579$ respectively) Maximum heart dose using 3DCRT non-coplanar AAPM planning methods was 624.99 cGy (95%CI: 63.33, 1186.65) higher compared to maximum heart doses using VMAT planning methods. ($p = 0.0139$). Maximum rib dose using 3DCRT non-coplanar AAPM planning methods was 1482.93 cGy (95%CI: 921.28, 2044.59) higher compared to maximum rib doses using VMAT planning methods. ($p < 0.0001$). Maximum rib dose using 3DCRT non-coplanar was 1272.57 cGy (95%CI: 710.91, 1834.22) higher compared maximum rib doses using VMAT planning methods. ($p < 0.0001$) Lastly, Maximum rib dose using 3DCRT coplanar planning methods was 1447.61 cGy (95%CI: 885.96, 2009.27) higher compared to VMAT planning methods.

Discussion/conclusion: VMAT technique demonstrated improved doses to OARs compared to 3D-CRT. The 3-partial arc technique appeared to have the lowest dose to all normal structures whereas both non-coplanar 3D-CRT techniques resulted in highest dose to OARs. Another advantage of VMAT technique over 3D-CRT is faster treatment delivery time which can anticipate to improve the tolerability of this treatment and reduce the chance of error due to intra-fraction motion.

Relevance to Allied Health: These findings have clinical implications for allied health disciplines in helping individuals with lung cancer malignancies to quit smoking as well as following certain nutritional diets to help boosting up their immunity and energy.

EXPLAINING LACK OF PARTICIPATION IN HIGHER EDUCATION FOR YOUNG ADULTS WITH INTELLECTUAL OR DEVELOPMENTAL DISABILITIES

AM Lusch, OTS-2¹, HN Blanden, OTS-2¹, BW DeGrace, PhD¹

Department of Rehabilitation Sciences, OUHSC, Oklahoma City, OK¹

Background: Young adults with intellectual and developmental disabilities in Oklahoma, along with their families, experience difficulty continuing their self-growth once they have graduated from high school, therefore hindering their participation. Specifically, evidence suggests that they cannot find the support they need to take part in post-secondary education. It is unclear if this is due to a lack of opportunities in Oklahoma, lack of awareness of the opportunities that exist, or a third, currently unknown issue.

Purpose: Therefore, the purpose of this research was to gain insight into the difficulties young adults and their families face in finding support and/or opportunities for self-growth in higher education post high school graduation.

Methods: To explore rationale explaining lack of participation post high school graduation (e.g. lack of opportunity, lack of awareness of opportunity, or a third, currently unknown issue) a Qualtrics survey was posted on various social media sites. The survey targeted individuals with developmental or intellectual disabilities and their caregivers. It included demographics and the following main questions: 1) Do you believe individuals with intellectual or developmental disabilities have opportunities to participate in college? 2) Do you know of any places or organizations that provide individuals with intellectual or developmental disabilities with opportunities to participate in college? Please list the opportunities that you are aware of. 3) Do you have access to these supports or others that would be necessary for you to participate in college? Survey results will be analyzed with descriptive statistics.

Results: It is hypothesized that lack of opportunity plays a major role in the lack of participation in higher education for young adults with intellectual or developmental disabilities, rather than lack of awareness of opportunity.

Relevance to Allied Health: Given that the mission of the College of Allied Health is to Empower Life, the results of this study will have implications for academia as well as future practitioners of Allied Health as it relates to promoting opportunities and participation in post-secondary education for individuals with intellectual and developmental disabilities.

TREATING UPPER EXTREMITY HYPERTONICITY IN CHILDREN WITH CEREBRAL PALSY: A CRITICALLY APPRAISED TOPIC

K. Blankenship, OTS-3¹; J. Tsotsoros, PhD, OTR/L, ATP¹

University of Oklahoma Health Sciences Center, College of Allied Health, Department of Rehabilitation Sciences¹

Background: Cerebral Palsy (CP) is a blanket term for the loss or impairment in motor function, often a result of brain damage occurring during gestational development or early infancy (cerebralpalsy.org, 2017). Symptoms of CP include things like abnormal speech patterns and motor movements, poor head control, abnormal tone in the upper and/or lower extremities or complete hemiplegia. Cerebral palsy is one of the most common physical disabilities among children in the US, which often limits the range and frequency of activities which children participate in (Anaby et al, 2009).

Purpose: The purpose of this critically appraised topic (CAT) was to investigate the clinical question: What is the best evidence-based approach for improving UE functioning in children with Cerebral Palsy?

Methods: Study inclusion criteria: studies included in this CAT investigated the effectiveness of either Botulinum Toxin Type A injection (BtA) or Constraint Induced Movement Therapy (CIMT) for improving functional upper extremity (UE) use for children with CP that exhibit hypertonicity in the UE. A literature search was performed using OVID, PubMed, AJOT, and the National Clearinghouse Guideline using the key terms: *pediatric, cerebral palsy, occupational therapy, functional performance, and goals*. This yielded 60 articles which were reviewed.

Results: A total of four articles with varying methodologies met the search criteria. The first study (Brandoa et al, 2012) was a randomized control trial using a pre-posttest design comparing the effects of CIMT to the HABIT training protocol on goal directed functional and self-care activities of children with CP. Results suggest that both CIMT and HABIT in conjunction with skilled therapy services can improve functional performance and self-care goals with demonstrated carryover into non-practiced goals. The second study (Hoare & Imms, 2004) was a literature review to understand the impact of BtA injection in the upper limb functioning of children with CP in addition with traditional Occupational Therapy. Results of the literature review suggest that BtA helps to temporarily reduce UE hypertonicity in children with CP; however, BtA is not appropriate for all children. BtA alone does not necessarily improve functional UE use for children with CP; however there are multiple studies which suggest that a course of BtA in combination with other therapies can improve muscle tone and functional abilities of children with CP (Hoare & Imms, 2004). The third article (Chen et al, 2015) was a nine month follow-up study focusing on children with bilateral upper limb impairments participating in an Occupational Therapy program following BtA. The study specifically focused on bilateral impairments because of a lack of research on bilateral impairment. Results of this study found improvements in grip strength, range of motion, and visual motor integration which persisted over the 9-month period. The fourth study (Boyd et al, 2012) was a randomized control trial comparing bimanual training versus CIMT and its effect on the quality of life for children with CP. Significant changes in feelings about functioning, perception of participation and physical health were maintained over a 52 week period for both groups. Children in the bimanual group reported immediate improvement on the impact of disability subset but this did not persist beyond a three week period. While each of these articles showed similarities in outcome measures and intervention type, the small sample sizes and lack of long term follow up make it hard to generalize to the entire population of children with Cerebral Palsy. Future research is needed to appraise the effectiveness on improving the functional UE performance of children with CP.

Conclusion: Both CIMT and BtA injection can be effective intervention tools for improving functional upper extremity use for children with CP, with CIMT showing slightly more favorable results overall. Both CIMT and BtA injections are most effective in conjunction with traditional Occupational and other therapy services.

Relevance to Allied Health: CIMT and BtA injection as an adjunct to traditional allied health services can improve the quality of life for children with CP.

DOES CAREGIVER TYPE RELATE TO PHYSICAL FUNCTION OF OLDER ADULTS IN A SKILLED NURSING FACILITY?

Katie Blankenship, OTS-3, Jack Beyer, OTS-3, and Hongwu Wang, PhD
University of Oklahoma Health Sciences Center, College of Allied Health, Department of Rehabilitation Sciences

Background: Nearly 43.5 million Americans provide unpaid care to a loved one aged 50 years or older; this equates to over 18.1 billion hours of informal assistance every year (Adelman, Delgado, Dion, Lachs, & Tmanova, 2014). Caregiving is a stressor that can increase adult depression rates, social isolation, and negative patient outcomes (Adelman et al., 2014). Minimizing perceived burden by improving physical performance in older adults may moderate these outcomes. Copious amounts of research has been conducted on caregiver burden, caregiver depression rates, and strategies to improve the experience of being a caregiver. However, few research has been conducted on the correlation between functional status of older adults and the types of caregivers.

Purpose/Hypothesis: The purpose of this outcomes research project was to investigate the clinical question: *Does caregiver type relate to physical function of older adults in a skilled nursing facility?* We hypothesize that older adults who have a spouse as their primary caregiver will have greater physical functioning than those with another primary caregiver type after intervention.

Methods: We conducted a one-group longitudinal study to examine the effect of primary caregiver type on functional status of older adults admitted to a skilled nursing facility (SNF). Inclusion criteria: 1) Adults >35 admitted to a SNF in Oklahoma City; 2) requiring at least a 3-midnight stay in a hospital prior to admission; 3) patient received skilled OT services a minimum 5 times a week during length of stay. Patients were grouped according to primary caregiver type (spouse, child, other) and scored for physical functioning at admission and again at discharge. Functional status was measured using the Barthel ADL Index. The Barthel is a ten-item observation questionnaire that measures functional independence in patients with a neuromuscular or musculoskeletal impairment. Scoring scale for the Barthel is out of 100; scores equal to or closer to 100 indicate a higher level of functional independence. One-way analysis of covariance (ANCOVA) and descriptive statistics were used to analyze the association between caregiver type and physical functioning of older adults.

Results: Of the participants sampled (n=26), the mean age was 76.7 years (SD: 14.4); 54% (14/26) were male, 12% (3/26) were African American, 8% (2/26) were Hispanic, and 80% (21/26) were white. A one-way ANCOVA test was conducted to determine a statistically significant difference between caregiver type on final Barthel scores while controlling for baseline Barthel score ($F= 0.0001$). No significant difference was found for the change in mean scores across the three groups during post-hoc testing. Adjusted mean of final Barthel scores of home support groups spouse, child, and other were 50.8, 41.4, and 54.3 respectively.

Discussion: Caregiver type has an effect on physical function of older adults after receiving skilled OT intervention. After analysis of mean scores, those in the spouse group improved the most after receiving skilled OT intervention, while those with a child as their primary caregiver improved the least. This is in agreement with previous studies that suggest that those with their spouse as a primary caregiver are less independent at baseline, and thus improve the most during rehab. Limitations in this study include a small sample size, with only four participants in the spouse home support group. Final Barthel scores for some participants were obtained before completion of the course of rehab.

Relevance to allied health professionals: Understanding home support and its effect on patient outcomes could influence the type and length of intervention given by allied health professionals in a clinical setting.

FOCAL MUSCLE VIBRATION FOR POST-STROKE REHABILITATION: A SYSTEMATIC REVIEW OF PROTOCOLS AND OUTCOMES

S. Bulloch, OTS-2¹, C. Coon, OTS-2¹, H. Wang, PhD.¹, A. Mdzinarishvili, PhD¹

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Background: Stroke is currently the leading cause of disability in the United States. Because of the complexity of a stroke, researchers are continuously working on new interventions to increase independence in stroke survivors; one intervention that has been increasingly studied in the last ten years is focal muscle vibration (FMV). Understanding the experimental protocols and establishing which outcome measures are commonly used in FMV studies in stroke rehabilitation may help improve consensus among scientists and clinicians.

Purpose: The purpose of this study is to examine the experimental protocols and identify the commonly used outcome measures in FMV based intervention studies after stroke.

Methods: PubMed, Ovid Medline, CINAHL, Science Citation Index, and Cochrane databases were searched for FMV based intervention studies in stroke according to PRISMA guidelines. Key words for the search included stroke, post-stroke, stroke rehabilitation, focal muscle vibration, local muscle vibration, localized vibration, and local mechanical vibration. Studies were included from the last ten years, were written in English, treated patients who have had a stroke, and used focal muscle vibration as an intervention. Studies were excluded if they did not use focal vibration as the main intervention, treated multiple diagnoses, did not have at least one motor outcome, or did not report parameters for the application of vibration. Two review authors independently selected trials for inclusion, assessed trial quality and extracted data. Disagreement was resolved by discussion or, if necessary, referred to a third review author.

Results: 26 studies met all inclusion criteria, 11 were excluded. Of the 15 included, 3 studies looked at the effects of focal vibration on the lower extremity, and 12 looked at the effects of focal vibration on the upper extremity. Protocol for application of focal vibration varied widely. Frequency ranged from 60-300Hz. Amplitude was reported as “low amplitude” in 5 studies. 9 studies reported the amplitude numerically, with a range of .4mm-2mm. 1 study reported the amplitude as 10uV, which cannot be converted for comparison. Duration of application varied from 5 minutes to 60 minutes. For the lower extremity, there were 6 outcome measures used; 5 measured clinical outcomes and 1 measured functional outcomes. For the upper extremity, there were 18 outcome measures used; 13 measured clinical outcomes and 5 measured functional outcomes. Of the 3 studies that used focal vibration on the lower extremity, all reported decrease in postural sway. 2 of the 3 studies reported increased gait speed and increased stride length. For the upper extremity, 7 of the 12 studies reported decreased spasticity. 6 of the 12 studies reported increased hand dexterity.

Conclusion: The results showed inconsistent study protocols using different ranges of vibration frequency, amplitude, duration, and a large diversity of outcome measures used across studies. These findings illustrated the need for more research to understand the mechanism of FMV, and impacts of different vibration parameters on outcome measurements.

Relevance to Allied Health: The use of focal muscle vibration may be useful for the rehabilitation of individuals who have had a stroke. Understanding mechanisms and building consensus on study protocols and outcome measurements of focal muscle vibration will allow rehabilitation specialists to help their patients to become more independent.

WHOLE-BODY VIBRATION PROTOCOL AND OUTCOMES IN POST-STROKE REHABILITATION: A SYSTEMATIC REVIEW

Courtney Coon, OTS-2; Sarah Bulloch, OTS-2; Alexander Mdzinarishvili, PhD; Hongwu Wang, PhD
University of Oklahoma Health Sciences Center, College of Allied Health, Department of Rehabilitation
Sciences

Background: Brain stroke is the second most common cause of death worldwide and leads to considerable disability among survivors. People recovering from stroke experience various challenges including gait abnormalities, weakness, spasticity, decreased balance, and difficulty performing daily life activities. Whole-body vibration (WBV) is an emerging technology with evidence to support its rehabilitative use for various neurological conditions, including brain stroke; however, the mechanisms behind its success have not been defined.

Purpose: A comprehensive search of the literature was conducted to review the protocols and outcomes used for assessing the effectiveness of WBV in people diagnosed with stroke.

Methods: We searched the following electronic databases: OVID Medline, PubMed, Cochrane, EMBASE, and CINAHL with the key terms: *stroke, post-stroke, stroke rehabilitation, cerebrovascular accident, vibration, and whole-body vibration*. We included randomized controlled trials (RCTs) and systematic reviews published in the last 10 years comparing single or multiple sessions of WBV with different parameters to a passive intervention. Studies were not considered if researchers included subjects diagnosed with neurological conditions other than stroke or if they measured the effects of other vibration methods exclusively, such as focal vibration or neuromuscular electrical stimulation. Two review authors independently selected trials for inclusion, assessed trial quality and extracted data. Disagreement was resolved by discussion or, if necessary, referred to a third review author.

Results: 14 studies met the inclusion criteria. Of these, 11 are RCTs (Grade A, Level 1b) and 3 are systematic reviews (Grade A, Level 1a). WBV parameters and outcome measures were evaluated for 13 trials. Researchers applied various WBV parameters with frequencies ranging from 4-45 Hz, amplitudes from 0.44-6mm, vibration times between 30 seconds and 30 minutes, 10 different vibration devices and 5 different vibration types (4 vertical, 1 anteroposterior/mediolateral, 1 vertical/sinusoidal, 1 side-alternating, and 6 non-specified) over intervention periods ranging from a single session to 12 weeks. From the 42 outcomes measures used to assess the effectiveness of WBV, the most common were functional mobility (18 trials), balance (12 trials), muscle strength (9 trials), spasticity (7 trials), and motor function (4 trials). While three studies did not yield significant results, eleven studies reported a significant positive effect of WBV on one or more of the common outcomes.

Conclusion: From the current literature, there is insufficient evidence to support the clinical use of WBV to improve outcomes following stroke and a lack of standardized training protocols for frequency, amplitude, duration, and delivery method. The variance in outcome measures combined with inconsistent WBV parameters further complicates our ability to understand the mechanism underlying the effects of WBV. This review confirms the need for future research to obtain a more detailed understanding of the mechanisms behind WBV to improve outcomes in people recovering from brain stroke.

Relevance to Allied Health: WBV could be a useful tool for allied health professionals to improve functional outcomes and overall health and well-being for individuals recovering from stroke. A research opportunity exists for allied health professionals to determine the optimal WBV application protocol and the most effective outcome measures for assessing the effects of WBV.

THE EFFECTS OF A LOW-CARB, NON-KETOGENIC DIET VERSUS STANDARD DIABETES DIET ON GLYCEMIC CONTROL IN TYPE 1 DIABETES

Christina Crowder, RDN, CNSC^{2,3}; L.J. Chalmers, MD¹; D.H. Jelley, MD¹; Michelle Condren, PharmD, AE-C, CDE¹; Jennifer Graef, PhD, RD²; Sharnella Goudeau, RN¹; Julia Crawford, MLIS AHIP¹

¹Harold Hamm Diabetes Center—Tulsa, Department of Pediatrics, The University of Oklahoma-Tulsa School of Community Medicine

²Department of Nutritional Sciences, University of Oklahoma Health Sciences Center, Oklahoma City, OK

Background: Type 1 diabetes (T1D) is marked by total insulin dependence with challenges regarding glycemic control and concomitant sequela. While standard of care medical nutrition therapy for this disease centers on matching carbohydrate to insulin at meals, recent literature and clinical reports have shown superior glycemic control and cardiovascular measures with lower carbohydrate dietary patterns (<130g/day) as compared to the standard American MyPlate (50% total calories as carbohydrate) approach. Due to inherent error in carbohydrate counting, we propose that less carbohydrate will produce better glycemic control by minimizing error and subsequent variation in individuals with T1D. We also aim to explore the inflammatory effects of two different nutrition interventions in a population already predisposed to greater inflammation than healthy individuals due to autoimmunity and glycemic variability.

Purpose: The proposed research seeks to examine the effects of a non-ketogenic low carbohydrate (CHO) diet (60-80g per day) on glycemic control, lipids, and markers on inflammation in individuals with T1D.

Methods: This trial is an open label randomized crossover diet intervention that will take place at OU Tulsa Harold Hamm Diabetes Center. 17 participants ages 18-30 with type 1 diabetes will be computer-randomized in a 1:1 ratio to a sequence of two dietary patterns, 12 weeks on standard of care for diabetes and 12 weeks on a low carbohydrate diet (60-80 g/day) separated with an 8-week washout period.

Results/Area of feedback desired: We hypothesize a diet consisting of 60-80 g carbohydrate diet will result in greater improvement in glycemic control compared to a 50% carbohydrate diet in patients with Type 1 diabetes over 12 weeks in the outpatient setting.

Conclusion: Studies have investigated the use of low carbohydrate diet in individuals with type 1 diabetes but only in older aged individuals. Our study seeks to expand the evidence on macro and micronutrient intake paired with glycemic control. At this time, no evidenced-based universal recommendations from randomized controlled trials exist to support low carbohydrate dietary patterns as a front-line approach in individuals with type 1 diabetes mellitus.

Relevance to Allied Health: This study will be used to inform clinical practice, especially in teaching medical nutrition therapy to new-onset diabetes patients and those struggling with glycemic control and hyperlipidemia. At this time, no evidenced-based universal recommendations from randomized controlled trials exist to support low carbohydrate dietary patterns as a front-line approach in individuals with T1D.

Maximum End-Bearing after Transtibial Osteomyoplastic Amputation

JD Day, MA, CPO^{1,2}, WJJ Ertl, MD², D. Polanco, BS, CPO³

University of Oklahoma Health Sciences Center, CAH, Dept. of Rehabilitation Sciences, Oklahoma City, OK¹ University of Oklahoma Health Sciences Center, COM, Dept. of Orthopedic Surgery and Rehabilitation, Oklahoma City, OK² Hanger Prosthetics & Orthotics, Inc. dba Hanger Clinic, Austin, TX³

Background: Maximal end-bearing after osteomyoplastic amputation has not been scientifically evaluated and reported in the literature.

Purpose/Hypothesis: The purpose of this research was to quantify maximum end-bearing on the remnant limb after osteomyoplastic transtibial amputation. The researchers believed that osteomyoplastic transtibial remnant limbs would tolerate more end-bearing pressure compared to traditional amputation techniques reported in the literature.

Methods: Adults with primary or revision osteomyoplastic transtibial amputation who are at least six-months post-operation and using a prosthesis were included. Patient demographic, surgical, and rehabilitation data, including: Age, sex, weight, cause of amputation, time since amputation, duration of prosthetic use, limb length and prosthetic wear schedule were collected for each subject. Gel liner interface material is commonly worn on the remnant limb prior to donning the prosthesis. Subjects bore weight through their remnant limb on the scale three times with and without interface material. The height of the scale was adjusted for comfortable standing and the patient shifted weight and reported their maximum tolerable pressure. Patients were blinded to the display of the scale and the three trials with and without interface were averaged for analysis.

Results: Subjects (N=18), 15 males and 3 females, achieved a mean weight during the no interface trials of 55.9 pounds (9.7-240). The interface trials mean was 66.4 pounds (19-243). Mean end-bearing of the interface trials as percentage of subject's body weight was 33.39% (11.67-101.25).

Discussion/Conclusion: The results from this pilot study compared favorably to the reported literature. Subjects with immature remnant limbs tolerated less end-bearing compared to subjects who have been using a prosthesis more than a year. Subjects with osteomyoplastic transtibial amputation in this cohort tolerated more pressure than traditional transtibial amputations reported in the literature.

Relevance: End-bearing tolerance allows the prosthetist to align the prosthetic socket vertically, without socket flexion. This changes the biomechanics of the prosthesis within the patient's gait pattern. Physical therapists should be able to achieve greater step symmetry during gait training.

HANDWRITING ACQUISITION AND INTERVENTION: A SYSTEMATIC REVIEW

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Background: Elementary students spend approximately 50% of their school day performing handwriting and fine motor activities however, close to 30% of children have difficulty with handwriting. Opportunities for children to learn handwriting in elementary school are inconsistent with some children never receiving any direct instruction.

Purpose: The purpose of this systematic review was to provide a comprehensive review of handwriting acquisition and the effectiveness of handwriting interventions for children between pre-k and 2nd grade.

Methods: Reviewers searched relevant databases using preschool and handwriting interventions as key terms. Included articles were assessed for quality using the American Academy for Cerebral Palsy and Developmental Medicine (AACPD) Methodology to Develop Systematic Reviews of Treatment Interventions.

Results: A total of 11 studies were included in this review. Low level evidence supports children practicing handwriting and the use of explicitly taught handwriting programs during preschool to enhance letter recognition. No evidence supports the use of typing instruction to develop handwriting skills. Low level evidence support the use of motor learning and cognitive strategies to teach handwriting. Remediation of performance deficits alone are not effective.

Conclusion: Self-generated handwriting supports a range of functional skills including letter recognition and handwriting development. Handwriting activities implemented in K-2 classrooms by teachers or in collaboration with occupational therapists have some evidence to support implementation.

Relevance to Allied Health: Findings relevant for pediatric occupational and physical therapists and speech language pathologist working in preschool and elementary school settings. Taken together, the findings provide a rationale to retain handwriting instruction in primary grades and evidenced-based data to advocate to classroom based activities for preschoolers learning to write letters.

EFFECTIVENESS OF ATTENDING A DEVELOPMENTAL PRESCHOOL ON CHILDREN WITH DEVELOPMENTAL DISABILITIES

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Background: Outpatient occupational therapy (OT) has been a long-standing intervention for children with developmental disabilities (DD), ensuring that these children receive the most appropriate, client-centered care possible to improve their lives and allow them to participate in their chosen and necessary occupations. However, little research has been done to determine whether or not attending a developmental preschool in addition to receiving outpatient OT provides greater outcomes than therapy alone.

Purpose/Hypothesis: The purpose of this outcomes research study was to determine whether children with DD who attend a developmental preschool, as well as receive outpatient OT services, have better outcomes than children who receive outpatient OT services alone, as measured by a decrease in the number of goals in six categories: sensory processing, fine motor, strengthening, feeding, self-care, and social functioning.

Methods: We conducted a retrospective study with the following inclusion criteria: 1) children < 18 years of age; 2) diagnosed with a DD; 3) currently receiving outpatient OT. Once each child was evaluated by the OTR/L and determined eligible for OT services, the therapist wrote goals for each based on their areas of delay. The children then received OT weekly and half of the sample also attended the developmental preschool daily. The OT re-evaluated each child biannually. At the start of the study, each child had received OT services for a minimum of 6 months. The change in the number of goals written for the 6 categories listed above was used as the outcome measure to determine the effectiveness of attending the developmental preschool in addition to outpatient OT. Both the goals written at each child's first OT evaluation and those written at the most recent evaluation were collected from previous records. We used a paired, two-sample t-Test for means to determine whether there was any improvement between the pre- and post-intervention scores. Finally, we ran an independent, two-sample t-Test assuming unequal variances to determine if there was a difference in the improvements between the group of participants who only received OT services and those who attended the developmental preschool, as well.

Results: Of the participants sampled (n=12), the mean age was 65.25 months (SD: 17.6), the mean length of time receiving OT services was 30.25 months (SD: 7.2), 41.6% (5/12) were female and 58.3% (7/12) were male. There was no significant difference when comparing the goals written at the initial evaluation and the most recent evaluation in any of the 6 categories: sensory processing p=0.25, fine motor p=0.09, strengthening p=0.36, feeding p=0.18, self-care p=0.25, and social functioning p=0.05. Secondly, there was no significant difference between the two groups when analyzing the change in goals from the initial to the most recent evaluation in any of the 6 categories: sensory processing p=0.16, fine motor p=0.06, strengthening p=0.08, feeding p=0.19, self-care p=0.38, and social functioning p=0.30.

Discussion: This study provides no significant evidence to support that children attending a developmental preschool in addition to outpatient OT have better outcomes based on their change in goals written at their initial and most recent evaluation.

Relevance to allied health professionals: Many allied health professionals work in pediatric settings with children with developmental disabilities. Remaining updated on positive interventions for these children is helpful for both plans of care and referral choices.

SELF-DETERMINATION: SEEING WITH MORE THAN SIGHT

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Background: Transitioning into adulthood for individuals with visual impairments (VI) has received significant attention recently, but there is a limited amount of research concerning independent living and cooking and meal preparation for those with VI. This study addresses improving independent cooking and safety skills, and aims to increase self-determination (SD) skills to promote independent living in adulthood.

Purpose: The purpose of the study is to measure the effects of a group intervention on performance skills, safety, and SD skills when preparing meals and cooking in individuals with VI. The study aims to answer three clinical questions: Does a group cooking intervention for individuals with VI/blindness increase SD? Does a group cooking intervention for individuals with VI/blindness improve cooking independence as measured by the GAS? Does a group cooking intervention for individuals with VI/blindness improve independent cooking performance and satisfaction as measured by the COPM?

Methods: The researchers used a case series, A-B design. Participants were recruited through a community therapist and screened by the primary investigator (PI). Inclusion criteria were as follows: 1) the presence of a VI, 2) age (18-21), and 3) desire to live independently. The intervention was 10 weeks long with the focus of SD and independent cooking and safety skills. Specific group intervention cooking and safety topics included orientation to kitchen safety and work stations, menu planning, shopping, and budgeting, navigating the grocery store, meal preparation, and finally hosting a full dinner with guests. Each week of group intervention addressed aspects of SD and were incorporated into the activities. Researchers administered three measures: the Canadian Occupational Performance Measure (COPM), the Goal Attainment Scale (GAS), and the Self-determination Student Scale—Short Form (SDSS-SF). All measures were taken both at baseline and after the intervention phase.

Results: Researchers collected scores on the COPM, GAS, and SDSS-SF. All results were analyzed by the primary investigator. The results of the study were reported as change in scores for each of the assessments used. The changes in scores are as follows: COPM Performance - four points (Case 1), two points (Case 2), and five points (Case 3); COPM Satisfaction - six points (Case 1), five points (Case 2), and five points (Case 3); GAS Heart Source - four points (Case 1), three points (Case 2), and four points (Case 3); GAS Safety - three points (Case 1), four points (Case 2), and three points (Case 3); GAS Meal Complexity - three points (Case 1), three points (Case 2), and two points (Case 3); SDSS-SF - seven points (Case 1), 13 points (Case 2), and 40 points (Case 3). The positive change in all scores indicated a clinical significance.

Discussion: All participants improved on the measures of occupational performance and satisfaction, individual GAS, and SD. Young adults with VIs require interventions tailored to the participants' level of impairment that utilize strategies and assistive technology to promote independence with cooking and kitchen safety. Results of case studies suggest that providing group intervention may improve a patient's SD, independence, and occupational performance through the intervention presented.

Relevance to Allied Health: This study will help advance occupational therapy by highlighting successful strategies for people with visual impairments to transition into living as independent adults through interventions focused on self-determination and independent living skills.

The Food Desert/Food Swamp Status Of Oklahoma Early Care And Education Environments

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Background: In 2014, rates of obesity among 2-to-4-year-olds in Oklahoma whose families participated in Women, Infants, and Children or the Supplemental Nutrition Assistance Program were 13.8% and 15.8% respectively, which are both higher than the national prevalence of 8.9%. The food desert/food swamp status of one's home has previously been linked with high obesity rates. However, 61% of children under the age of five spend time in an early care and education environment (ECE). These locations are influential in these children's health as they spend, on average, 33 hours per week in an ECE (as of 2011). While residential food desert/food swamp status is relevant, the food desert/swamp status of ECEs has not previously been investigated.

Purpose: To determine the prevalence of ECEs located within food deserts and food swamps in the state of Oklahoma.

Methods: The locations of the approximately 3,000 ECEs in Oklahoma will be mapped using ArcGIS software, along with the locations of supermarkets, grocery stores, convenience stores, fast food restaurants, and other food outlets. Cross-sectional observation will be used to geocode these locations and to determine the food swamp and food desert status of the ECEs. Distance and time from each ECE to the nearest grocery store and fast-food restaurant will be determined using the Network Analyst Extension of ArcGIS. Frequencies will be determined for ECEs lying within and outside of both food deserts and food swamp tracts. The differences in prevalence of Certified Healthy ECE by food desert/food swamp status will be analyzed using a chi-square test. The average distance and time to accessible grocery and fast-food options from ECEs by food desert/swamp status will be determined by two one-way ANOVA tests.

Results/Areas of feedback desired: It is hypothesized that a higher frequency of ECEs will be found in food deserts/swamps, than outside those areas, that the prevalence of "certified healthy" ECEs will be lower in food desert/swamp areas compared to the prevalence outside those areas, and that there will be a statistically significant difference between the average distance to the closest grocery store and fast-food restaurant from ECEs based on their food desert/food swamp status. Feedback on how to increase the reliability of food outlet data collected is desired.

Conclusion: Studies have investigated the implications of living in a food desert and/or food swamp on obesity and health outcomes, but not the implications on preschool children attending an ECE within one of these areas. Our study will expand on previous spatial epidemiology studies and may lead to future interventions based on ECE food environment status.

Relevance to Allied Health: Allied Health professionals daily intersect the many age-related health consequences of childhood obesity, which include: orthopedic complications, type 2 diabetes and its complications, cardiovascular disease, increased rates of cancer. Because ECE food environment has the potential to majorly impact children's weight status, it warrants the consideration of Allied Health professionals across fields.

The Effect of ADL Training on the Functional Independence of Older Adults with Deconditioning

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Background: Deconditioning is a term used to describe functional decline in patients due to inactivity or bed rest. Approximately 18% of patients residing in inpatient rehabilitation facilities experience deconditioning, which results in decreased activity of daily living (ADL) function. Older adults (>65) are at increased risk of deconditioning especially when hospitalized. While according to one Delphi study the majority of occupational therapists agree that interventions focused on ADL are ideal for patients with deconditioning, there is little to no consistent evidence on the effectiveness of ADL training with this patient population.

Purpose/Hypothesis: The purpose of this study is to investigate the clinical question: Does ADL training improve functional independence of older adults with deconditioning in inpatient rehabilitation? We hypothesized that ADL training would improve functional independence of older adults with deconditioning admitted to an inpatient rehabilitation unit.

Methods: We conducted a one-group longitudinal observation study with pre- and post-measurements investigating the effect of ADL training on functional independence of older adults with deconditioning in an inpatient rehabilitation unit over the course of 4 weeks. Inclusion criteria: 1) adults > 60 experiencing deconditioning; 2) ADL training was an intervention used by an occupational therapist (OT). On admission an OT would collect initial Functional Independence Measure (FIM) scores from patients. Over the course of the patients' stay at the facility, the OT completed ADL training with the patient focusing on the skills the patient scored lowest on the FIM, however addressing all aspects of the FIM. At discharge the FIM was reassessed. This study used the FIM, which is an 18 item assessment that measures the amount of assistance an individual needs to complete ADL. In this study only 8 items that were focused on ADL were analyzed from the FIM: eating, showering, grooming, upper body dressing, lower body dressing, toileting, toilet transfer, and shower transfer. Each item is scored on a numeric scale of 1-7 with 1 equaling total dependence and 7 equaling total independence. The FIM has been proven to be valid, reliable, and responsive to changes in multiple studies. We analyzed data using descriptive statistics and one-tailed, paired sample t-tests.

Results: In our subject pool (n=6), the mean age was 69.7 years (SD: 9.6), 50.0% (3/6) were male, and 66.7% (4/6) were Caucasian. The individual one-tailed t-test showed all ADL items had significant results (p<0.05): shower transfer (p=0.013), toilet transfer (p=0.024), grooming (p=0.014), showering (p=0.001), upper body dressing (p=0.031), lower body dressing (0.02), toileting (p=0.028) and eating (p=0.02). The post-intervention total FIM score (an 8 item summation) mean (M=41.2 [SD: 9.1]) was significantly higher (p=0.001) than the pre-intervention total FIM score mean (M=22.7 [SD:5.7]).

Discussion: As shown with the significant data above, an ADL training intervention provided by an OT may be a useful therapeutic approach to increasing functional independence in older individuals with deconditioning. Our study was limited by a small sample size and is not generalizable. Future research should analyze the effectiveness of this approach compared to other commonly used interventions with this patient population.

Relevance to Allied Health Professionals: It is estimated that in 2030 1 out of 5 individuals living in the United States will be over 65 and in 2060 that jumps to 1 out of 4. With an increasing older population in our country it is vital that allied health practitioners understand the conditions afflicting this population and our role in alleviating them.

Determining the Effectiveness of Occupational Therapy Interventions with Patients Diagnosed with Deconditioning

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Background: Deconditioning is a term used to describe systemic physiological and functional decline in patients due to inactivity or bed rest. Approximately 18% of patients residing in inpatient rehabilitation facilities experience deconditioning, which results in decreased activity of daily living (ADL) function. Older adults (>65) are at increased risk of deconditioning especially when hospitalized due to the sedentary nature of medical care. While residing in hospitals most patients spend an increased time inactive and lying in bed, which can lead to a five percent decrease in muscle strength per day. While according to one Delphi study the majority of occupational therapists agree that interventions focused on ADLs and exercise are ideal for patients with deconditioning, there is little to no consistent evidence on the effectiveness of ADL training or exercise with older deconditioned adults.

Purpose: The purpose of this study is to determine and compare the effectiveness of ADL training, exercise-based interventions, and the combination of these two interventions together in older adults diagnosed with deconditioning in an inpatient rehabilitation setting.

Methods: This longitudinal cohort study will be performed at several hospitals with inpatient rehabilitation units around Oklahoma City over ten weeks. Subjects will be randomly placed in one of the three therapy groups. Due to the negligent nature of withholding one intervention or the other, subjects will be randomly assigned to one of three groups with varying exposure to the target intervention. The Exercise-based group will utilize exercise at least 50% of the time and ADL training less than 20% of the time. In the ADL group, ADL training will be the primary mode of intervention with its utilization at least 50% of the time and exercise-based interventions used less than 20% of the time. In the combination group, both interventions will account for at least 80% of therapy sessions. An occupational therapist will evaluate the patients upon admission and at discharge to obtain their Functional Independence Measure (FIM) and Patient-Specific Functional Scale (PSFS) scores. Descriptive statistics will be obtained on age, sex, and race/ethnicity in the three groups and overall. A one-way ANOVA test will be performed on the total FIM scores to analyze the three intervention groups in order to determine which intervention has the biggest impact on functional independence. Another one-way ANOVA test will be used on the PSFS scores as well, to ascertain the impact on functional independence from the patients' perspective.

Results: It is hypothesized that the group receiving both ADL training and exercise-based interventions will be most effective in improving functional independence.

Conclusion: While it is agreed upon by occupational therapists that exercise and ADL training are the most beneficial interventions in improving functional independence in patients with deconditioning, there is little formal evidence to back up that claim. This study will provide evidence of which interventions are most effective at increasing functional independence.

Relevance to Allied Health: It is estimated that in 2030, 1 out of 5 individuals living in the United States will be over 65 and in 2060 that jumps to 1 out of 4. With an increasing older population in our country, it is vital that allied health practitioners understand the conditions afflicting this population and our role in alleviating them.

EFFECTIVENESS OF INDIVIDUALIZED SENSORY INTERVENTION ON LIFE PERFORMANCE FOR KIDS WITH SENSORY PROCESSING ISSUES

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Background: There is a lack of research and evidence specifically exploring the prevalence of sensory processing issues. Sensory processing issues can be accompanied by another primary diagnosis such as Autism. Estimated rates of sensory processing issues with children of various disabilities are as high as 88%. The high prevalence of this problem creates an important role for the occupational therapist (OT). The OT creates an individualized sensory intervention plan for each child who demonstrates sensory difficulties.

Purpose: The purpose of this outcome research project was to investigate the clinical question: Are there differences in life performance as measured by the COPM among children with different sensory profiles after receiving skilled outpatient occupational therapy?

Methods: We conducted a single-group longitudinal study over a period of 8 weeks in an Oklahoma pediatric outpatient occupational therapy clinic. Inclusion criteria: 1) children < 18 years old; 2) scores qualified for sensory treatment intervention as measured by the Sensory Profile 2; 3) currently receiving outpatient occupational therapy services. Exclusion criteria: 1) Scores did not qualify for sensory treatment as measured by the Sensory Profile 2; 2) Caregiver did not report sensory issues during interview. Patients were initially evaluated to determine eligibility for receiving occupational therapy services. If determined eligible then each child received individualized goals for the areas of needed improvement and areas of concern obtained via caregiver interview. We utilized the COPM to assess the child's overall "life performance". The COPM information was collected from the participants' caregiver. The COPM utilizes a 1-10 measurement scale in which 1 = very poor performance and 10 = very good performance.

Results: We computed measures of central tendency to summarize the data for the age variable. The following are the results of the analysis; N = 13, M= 55.5 months, SD = 16.9. The large standard deviation shows that there were a wide variety of ages included in this study. Using descriptive statistics 38.5% (5/13) were female, 61.5% (8/13) were male, 100% (13/13) were Caucasian. A paired samples one-tailed t-test was conducted to compare pre and post scores of performance and satisfaction obtained from the COPM. There was a significant difference in the scores for the performance category (M= 3.7, SD= 2.2); $t(12) = -6.12$, $p = <0.01 <0.05$. There was a significant difference in the scores for the satisfaction category (M= 4.5, SD= 3.2); $t(12) = -4.98$, $p = <0.01 <0.05$.

Discussion/Conclusion: The information in this study shows a significant change in the COPM scores meaning that the sensory intervention provided at this clinic are effective for improving life performance of children who demonstrate differences in sensory processing. There are several significant limitations inherent in the study including: a small sample size (n-13), a lack of diversity (100% Caucasian), a short time frame, subjective caregiver report assessment, and patients all had varying amounts of previous therapy.

Relevance to allied health professionals: Allied health professionals will interact with patients who have sensory processing difficulties and therefore need to be aware of the prevalence of sensory issues and understand the strategies that can be utilized for increased positive patient interaction.

EXERCISE ADHERENCE IN A PILOT RANDOMIZED TRIAL OF PREHABILITATION BEFORE PANCREATICODUODENECTOMY

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Background: Already the 4th leading cause of US cancer deaths, pancreatic cancer (PanC) incidence is rising. Five-year survival rate is 8%, and pancreaticoduodenectomy (PD) is the only chance at cure, but with 40-70% risk of peri-operative complications. Sarcopenia, or loss of muscle mass, strength, and performance is a hallmark of PanC that predicts worse survival outcomes. Pre-operative exercise ('prehab') programs that include strength training are beneficial in other cancers, but the benefits of strength training in PanC, especially limited to the 2 week period before PD, is unknown. Also unknown is the adherence to high dose home exercise when prescribed in this same period. We initiated a pilot study to establish feasibility of a larger RCT. In the larger study, we aim to quantify the isolated impact of strength training (SPRE) when added to 'standard' multimodal prehab (NPRE) in the brief window between surgical consent and surgical resection in PD.

Purpose: *The purpose of this analysis is to estimate exercise adherence from preliminary results of our ongoing pilot RCT, compare adherence across the two intervention arms, and explore barriers and facilitators to exercise in the PD population.* Anticipating high symptom burden and considering the gravity of a PanC diagnosis, we hypothesize that adherence in our sample will be lower than those published for other cancers, especially cancers with higher survival rates. We do not anticipate a difference in adherence between NPRE and SPRE arms.

Methods: At the time of this submission, adherence data were available for 37 participants (mean age 67.7±9.2 years, 51% female, 92.5% white/ 5% American Indian/ 2.5% black). All had potentially resectable PanC or high-risk premalignancy (PM) and had consented to PD in 2 weeks, with surgical clearance to begin moderate intensity exercise. All were independent with household mobility. After baseline function testing, the PanC survivors were randomized to NPRE or SPRE, and met with a physical therapist (PT) for a single in-person training session in daily home exercise of endurance training, plus 7-8 exercises of either AROM (NPRE) or strengthening (SPRE) exercises selected to target upper and lower body large muscle groups. Participants with PM were assigned SPRE outside of the randomization scheme. All participants were given a goal of progressing to 60 minutes of daily exercise before surgery. All kept a diary, and received 2-3 follow-up phone calls over 2 weeks for adherence interview and progression. *Adherence (%) was calculated as: # of days exercise was performed / total days in the intervention period, and transformed to a 3-category scale informed by published cancer exercise adherence articles: Full = 75-100%, Moderate (Mod) = 50-74%, Minimal (Min) <50%.* Results were calculated separately for Endurance and 'Other' (AROM or strength), and by NPRE or SPRE group. For between-groups (NPRE and SPRE) comparisons by independent samples 2-sided t-tests in SPSS, adherence results were further collapsed to 2 categories ('Full' or 'Mod/Min').

Results: SPRE group (n=25) adherence to Endurance training was 68.0% Full, 20.0% Mod, 12.0% Min, and to Strength training was 76.0%, 8.0%, 16%. NPRE group adherence to both endurance and AROM was 91.7%, 0%, 8.3%. Between-group differences in Full adherence did not reach statistical significance, and did not change when PM SPRE participants were removed from analysis. *Note: Conclusions may change at time of presentation, as results will be updated to reflect current enrollment.*

Discussions/Conclusions: Even with PanC diagnosis, active symptoms, and surgery in 2 weeks, our sample had equal or greater adherence to daily high-dose home exercise when compared to values published for similar multimodal prehab programs, many of lower dose. Although not statistically significant, adding strength training may lower adherence in some survivors, but this is a hypothesis requiring further investigation. Co-survivor buy-in, direct surgeon recommendation, and phone follow-up were facilitators. Active caregiving role was a barrier.

Relevance to Allied Health: Brief pre-operative windows of time may be 'critical periods' in which cancer survivors are especially amenable to interventions or preventions from allied healthcare providers. These findings may extend beyond PanC to other cancers, and to other newly diagnosed conditions requiring major surgery, so should be further explored.

EFFECTIVENESS OF AN OTOTOXICITY INSERVICE TRAINING FOR NURSING STUDENTS

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Background: Baccalaureate nursing education programs that prepare graduates for licensure as registered nurses include extensive coursework and clinical experience in medication administration and patient education. However, nursing students in a baccalaureate nursing degree program may lack a basic understanding of the number and types of medications that are associated with hearing loss and could benefit from additional training to recognize the symptoms of ototoxicity and advocate for audiologic evaluation when hearing loss is suspected (Marx et al, 2015).

Purpose: To assess the effectiveness of an instructional session for nursing students regarding medication-related ototoxicity and the shared role of the audiologist and nursing professional in monitoring ototoxic exposures.

Methods: 29 senior nursing students participated in a 30-minute instructional session designed to increase nursing students' knowledge about medication-related ototoxicity, including commonly prescribed medications with ototoxic side effects, signs of hearing loss, and the need for audiologic referral for evaluation. Participants completed pre-test and post-test questionnaires regarding ototoxicity and appropriate referral. The questionnaires included questions regarding commonly prescribed medications used in the medical-surgical setting that are potentially ototoxic as well as basic measures to screen for ototoxicity and initiate a referral for an audiologic evaluation. Pre- and post-session responses were compared using descriptive statistics paired tests to determine whether the instructional session had any short-term impact on the goals identified in the specific aims.

Results: Data collection was completed December 2017 and analysis will be complete in time for presentation. We anticipate that participation in the instructional session will (1) increase the knowledge of nursing students regarding commonly-prescribed ototoxic medications; (2) assist students in identifying less common signs of hearing loss secondary to ototoxic exposure (i.e., tinnitus, difficulty listening in noise); and (3) increase the knowledge of students regarding appropriateness of referrals for hearing and balance evaluation in patients who are at risk of ototoxic exposure.

Conclusion: There is a critical need for audiologists to work alongside other health professionals to assist patients with hearing and balance disorders. Nursing professionals are in a position to detect changes in hearing or balance as well as medication changes that may place a patient at risk for ototoxic exposure. Outreach to students training to be nurses serves both professions and helps to make earlier and better identification of patients at risk for ototoxicity. Hearing loss is common in individuals of all ages, and may be caused by certain medications. All healthcare professionals should be able to recognize common signs of hearing loss and refer patients and their families to Audiology when needed.

COMPARISON OF SPEECH-LANGUAGE AND HEARING SERVICES OF GREECE AND THE UNITED STATES

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Background: Faculty and students from the Department of Communication Sciences and Disorders at the University of Oklahoma Health Sciences Center went to Greece on a study abroad trip in May 2017. We planned, designed, conducted, and presented a small study on comparison of services in the U.S. and Greece.

Purpose: The purpose of our research was to examine the similarities and differences in the provision of speech language pathology and audiology services between the United States and Greece.

Method: Participants were recruited through the professional and licensing agencies in Greece. A survey was emailed to potential participants. Professionals at the Theotokos Foundation also were given the survey and the speech-language pathologists helped to distribute it. A total of 22 people completed the survey. The survey consisted of 21 questions pertaining to professional experiences and outcomes. Seven questions were specific to Speech-Language Pathology services and six questions were specific to Audiology services in Greece. We were able to visit Theotokos Foundation, a nonprofit welfare organization that offers speech-language pathology services, as well as many other services (OT, psychologists, neurologists, nurses, etc.). It provided us with a unique insight into available services in Greece.

Results: Speech-Language Pathology: Of the participants, 9 worked in private practices, 2 worked in disability centers, 3 in public schools, and 1 in a hospital. The average salary of a SLP in Greece was roughly \$30,000 less than the average salary of a SLP in the U.S. The typical caseload in Greece is about 8 patients a day, equaling about 30 patients a week; in the U.S., the average caseload is around 48 patients per week. There is no maximum caseload requirement for Greece SLPs, but in the U.S., the maximum caseload varies by state. In Oklahoma, the caseload maximum is 50 students per SLP or SLPA in the schools, although some SLPs carry a higher caseload due to shortages of SLPs and SLPAs to provide services in the schools. Hearing screenings are not conducted by SLPs in Greece whereas SLPs in the U.S. are qualified to conduct hearing screenings.

Audiology: Ear, Nose, & Throat (ENT) physicians are heavily relied on for hearing services, because there are no audiologists in Greece. Newborn hearing screenings are not a requirement in Greece as they are in America.

Conclusion: We found that there are many differences between the SLP and Audiology services provided in Greece and the United States, most of the differences being due to the availability of services.

Relevance to Allied Health: Since Allied Health professions do exist in varying levels in other countries, this project shows how to get some insight into services for two allied health professions in the United States and Greece.

Beam Arrangement Treatment Planning Comparison for Centrally Located Lung Cancer
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Background: Radiation therapy plays a significant role in the management of lung cancer. Over half of lung cancer patients will receive radiation therapy at some point throughout their treatment. Health care professions must closely look at radiation-induced toxicities and complications for these patients. During radiotherapy treatment to the thoracic region, the issue of toxicity to the lungs and heart is of primary concern.

Purpose: The purpose of this study was to determine appropriate beam arrangements for volumetric-modulated arc therapy (VMAT) in the treatment of patients with centrally located, right-sided lung cancer.

Methods: Twenty-five consecutive patients with central, right-sided lung cancer placement were utilized for this study. For each patient, three VMAT plans were generated using two right-sided coplanar partial arcs (CP VMAT), two right-sided non-coplanar partial arcs (NCP VMAT), and one coplanar full arc (Full VMAT). All treatments were planned to deliver 63 Gy in 35 fractions, with PTV target coverage uniformly over 95%. While ensuring optimal target coverage, organ sparing was compared across the techniques. Lung, contralateral lung, and heart doses among the three treatment plans were compared using repeated measures ANOVA. All ANOVA models assumed a 1% chance of a type 1 error, with a Tukey's adjustment for multiple comparisons.

Results: Evaluating the V37 for the right lung subtracting the PTV, Coplanar plans were 83.9 cGy (99%CI: 54.5, 113.4) lower compared to non-coplanar plans, and full arc plans were 119.1 cGy (99%CI: 70.8, 167.4) higher compared to non-coplanar plans ($p < 0.0001$). Evaluating the mean dose for the right lung subtracting the PTV, there was no difference between co-planar plans and non-coplanar plans or co-planar plans and full-arc plans. However, non-coplanar plan doses were 69.4 cGy (99% CI: 33.7, 105.2) less compared to full-arc plans ($p < 0.0001$). Evaluating the contralateral lung mean dose, non-coplanar plans were favored and showed 223.96 cGy (99%CI: 178.1, 269.8) lower doses compared to full arc plans, and 52.7 cGy (99%CI: 25.5, 79.9) lower compared to non-coplanar plans ($p < 0.0001$, $p < 0.0001$ respectively). For the heart doses, non-coplanar plans were favored when evaluating the heart mean, max, and V33. Among the heart mean doses, non-coplanar plans were 334.0 cGy (99%CI: 250.8, 417.2) lower compared to full arc plans, and 158.8 cGy (99%CI: 93.9, 223.7) lower compared to coplanar plans ($p < 0.0001$, $p < 0.0001$ respectively). Among the heart max doses, non-coplanar plans were 564.4 cGy (99%CI: 392.8, 735.9) lower compared to full arc plans, and 283.0 cGy (99%CI: 151.7, 414.4) lower compared to coplanar plans ($p < 0.0001$, $p < 0.0001$ respectively). Among the V33 Heart doses, non-coplanar plans were 600.6 cGy (99%CI: 480.4, 720.8) lower compared to full arc doses, and 291.7 cGy (99%CI: 200.1, 383.3) lower compared to coplanar plans ($p < 0.0001$, $p < 0.0001$ respectively).

Discussion: VMAT techniques achieve highly conformal dose distributions for lung tumors. Full arc VMAT plans noticeably increase contralateral lung dose without organ sparing, so alternate VMAT plans are more suitable. Although NCP VMAT plans achieve slightly lower lung and heart doses, the doses were not significant enough to adopt this treatment technique and should be considered on "case-by-case" basis when organ sparing is critical.

Relevance to Allied Health: To provide high quality care for cancer patients, inter-professional care from nutritional sciences and physical therapy is crucial in maintaining a healthy weight and physical strength.

Evaluating the Dosimetric Differences and Treatment Plan Qualities between Pinnacle's Auto-Planning vs. Manual Planning in Patients with Prostate Cancer

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Background: Radiation therapy treatments play an important role in treating prostate cancer, but creating manual radiation therapy treatment plans can often be complicated and labor intensive. However, with recent developments in Radiation Oncology, new automated planning algorithms have recently been created to improve the quality and consistency of radiation therapy treatment plans used to treat many different types of cancer.

Purpose: The purpose of this study was to compare the dosimetric differences and treatment plan qualities of Pinnacle's Auto-Planning vs. manual planning in patients with prostate cancer.

Methods: CT datasets of twenty-five consecutive patients with prostate cancer were utilized for this study. For each of these patients a manual plan and auto-plan were generated. All plans were planned using the VMAT technique, using two full arcs. The doses to the bladder, rectum, femoral heads, and penile bulb were recorded and analyzed, as well as the time it took to complete each plan. All plans were planned to deliver a prescription dose of 79.2 Gy in 44 fractions, with PTV receiving at least 95% of the prescription dose. Normality assumptions for each variable were investigated using Shapiro Wilk tests, and a paired t-test or Wilcoxon signed-rank tests were used where appropriate. Due to multiple comparisons, all statistical tests assumed a 1% chance of a type one error.

Results: All doses passed normality assumptions, however planning time failed normality assumptions and was analyzed using a Wilcoxon signed-rank test. Manual plan bladder V25 doses were 5.7 Gy (99% CI: 4.1, 7.3) higher compared to auto plan bladder V25 doses. ($p < 0.0001$) Manual plan bladder V35 doses were 5.3 Gy (99% CI: 3.4, 7.2) higher compared to auto plan bladder V35 doses. ($p < 0.0001$). Manual plan bladder V50 doses were 4.5 Gy (99% CI: 2.2, 6.7) higher compared to auto plan bladder V50 doses. ($P < 0.0001$). Manual plan rectum V25 doses were 5.9 Gy (99% CI: 3.1, 8.7) higher compared to auto plan rectum V25 doses. ($P < 0.0001$) Manual plan rectum V35 doses were 4.9 Gy (99% CI: 2.6, 7.2) higher compared to auto plan rectum V35 doses. ($P < 0.0001$) Manual plan rectum V50 doses were 5.0 Gy (99% CI: 2.3, 7.7) higher compared to auto plan rectum V50 doses. ($P < 0.0001$) Manual plan right femoral head doses were 3.9 Gy (99% CI: 2.6, 5.3) higher compared to auto plan right femoral head doses. ($P < 0.0001$) Manual plan left femoral head doses were 3.2 Gy (99% CI: 1.5, 4.8) higher compared to auto plan left femoral head doses. ($P < 0.0001$) Manual plan penile bulb doses were 5.2 Gy (99% CI: 2.5, 7.9) higher compared to auto plan penile bulb doses. ($P < 0.0001$) On average, manual plans took 38.4 minutes, which was higher compared to the average time of 26 minutes for automatic plans. ($p < 0.0001$)

Discussion: Pinnacle's Auto-Planning achieved high quality and consistent treatment plans for prostate cancer patients. The auto-plans reduced doses to the surrounding critical structures, while still giving adequate coverage to the PTV. The time required to generate a clinically acceptable treatment plan was also shorter than that of the manual plans.

Relevance to Allied Health: Treating cancer patients requires teamwork from multiple health professions, including physical therapy and nutrition to help with maintaining physical strength as well as maintaining a healthy weight throughout radiation treatments. Decreasing doses to non-target organs like the head of the femur can better help Allied Health professionals in fields like physical or occupational therapy.

Children's and Adults Sentence Recognition and Listening Effort in Noise

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ABSTRACT

Background: Learning can be difficult in classrooms due to poor acoustics. Generally, two factors can make understanding speech difficult for children: (1) noise, and (2) reverberation. The poorer the S/N, the more listening effort that is expended during speech recognition which leaves fewer cognitive resources to allocate to other tasks which can impact their academic performance in reading, spelling, and math.

Purpose: Using a speech recognition task in which the S/N gets poorer with each successive sentence, we aim to compare 10 to 12 year-old children and young adults with normal hearing on: (1) their subjective ratings of the listening task, (2) the change in their listening effort as measured by: (i) GSR and (ii) pupillometry, and (3) their accuracy in recognizing the sentences.

Methods: A total of 45 participants was needed in each group (15 children; 30 young adults) to have adequate power analysis to achieve a minimum 80% power, assuming a 5% chance of a type 1 error. All participants will listen to the *BKB-Sentences in Noise* Test (Etymotic, 2015) that have sentences presented at a successively poorer S/Ns (i.e., +21, +18, +15, +12, +9, +6, +3, 0, -3 and -6 dB) while their listening effort is measured.

Results: Descriptive statistics will be computed for all collected variables in the sample. Pupillometry and galvanic skin response (GSR) will be compared among children and young adults at several S/N ratio levels by repeated measures ANOVA. Tests for interaction among the treatment groups will be used to identify disparities in the increase/decrease in pupillometry and GSR among children and young adults. The proportion of correct answers among children and young adults will be computed along with binomial 95% confidence intervals. These proportions will be compared using a Z-test for population proportions. Lastly, subjective effort ratings will be analyzed both descriptively and by dichotomizing the variable into "easy" or "difficult". Proportions reporting difficulty in each effort rating variable will be reported and compared using Z-tests for population proportion. All statistical tests will be computed assuming a 5% chance of a type one error.

Discussions/ Conclusions: From the results of this study, we will have an idea how children compare with young adults in their understanding of or and listening effort expended sentences in progressively worsening S/Ns. This information will be useful in advocating for adequate acoustic conditions in classrooms.

Relevance to Allied Health: Information about the amount of listening effort children use in difficult listening situations compared to young adults will provide allied health professionals information for advocating for children who may need accommodations in noisy classrooms for optimal learning. Although this study used typically developing children, the results can be

generalizable to children with disabilities who will have an even more difficult time understanding teachers and peers in noisy classrooms.

LONGITUDINAL TRAJECTORIES AND REFERENCE PERCENTILES OF IMPAIRMENTS IN CHILDREN WITH CEREBRAL PALSY

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Background: Children with cerebral palsy (CP) often present with impairments in postural control, strength, range of motion, and endurance. Monitoring of these impairments over time allows therapists to develop optimal intervention activities targeted to children's unique needs.

Purpose: The purpose of this study is to document longitudinal developmental trajectories on measures of balance, range of motion, functional strength, and endurance with age-specific reference percentiles and the amount of change typical over a one-year period, for children within different Gross Motor Function Classification System (GMFCS) levels.

Methods: This longitudinal cohort study included 708 children with CP ages 18-months to 12-years of age and their families. Children participated in two to five assessments using the GMFCS, the Early Clinical Assessment of Balance (ECAB), Spinal Alignment and Range of Motion Measure (SAROMM), Functional Strength Assessment (FSA), and Early Activity Scales for Endurance (EASE). Parents completed the EASE and trained assessors completed the other measures. Data were analyzed using mixed-effects models and quantile regression.

Results: Longitudinal trajectories describing the average change in the ECAB, SAROMM, FSA, and EASE scores with respect to age were created by fitting separate nonlinear mixed-effects models for children in each GMFCS level. Reference percentiles were constructed using quantile regression data from each measure using the first, 12-month, and 24-month visits. Using these reference percentiles, the amount of change in reference percentiles was calculated for all children by subtracting the baseline percentile score from the twelve-month percentiles score. Children whose percentile changes are within the 80% limits can usually be described as 'developing as expected' for their age and GMFCS levels.

Conclusions: When used appropriately to monitor development and change over time for children with CP, the longitudinal trajectories, reference percentiles and the associated change scores presented should assist therapists and families' in collaborative interaction to proactively plan services and intervention relative to balance ability.

Relevance to Allied Health: These findings provide allied health providers a means of monitoring change in impairments in children with cerebral palsy. This data will assist with program planning.

Hearing-Aid Uptake in Severe Tinnitus Patients with Very Mild Losses

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Introduction

About 50 million persons complain of having some degree of tinnitus. Hearing aids are the recommended treatment for tinnitus patients with hearing loss.¹

Background

The American Academy of Otolaryngology, Head, and Neck Surgery published a clinical practice guideline providing recommendations that address the evaluation and treatment of patients with primary tinnitus and hearing loss. The recommendations for these patients included having prompt and routine audiologic evaluations, education/counseling, and hearing aid evaluations.¹

Some believe that over-the-counter hearing aids may improve accessibility and affordability of amplification for patients with hearing loss.² The American Academy of Audiology³ supports the idea for those with mild sensorineural hearing loss (MSNHL) defined as a four frequency pure-tone average (FFPTA) of 26 to 40 dB HL. Direct-to-consumer models probably would not work with those having primary tinnitus. We were curious about the prevalence and the characteristics of patients with MSNHL presenting to a specialty tinnitus and sound sensitivity clinic.

Purpose

A retrospective chart review (RCR) of patients presenting to a specialty tinnitus and sound sensitivity clinic over a two and a half year period was conducted to determine the prevalence of individuals with MSNHL, the characteristics of that cohort, and what patient factors determined intervention pathways.

Methods

A RCR of all patients presenting to a specialty clinic between from 1/1/15 to 6/30/17. Data were extracted for age, FFPTA, speech recognition thresholds, word recognition scores, Tinnitus Intake Form⁴ data, and scores on the Tinnitus Handicap Inventory⁵ (THI) and Tinnitus Function Index⁶ (TFI).

Variables and those significant in univariate models were included a multivariate model. Step-wise forward selection was used to determine the final predictive logistic model and began with THI and TFI severity categorizations and all results were adjusted for these variables. The predictability and fit were assessed by the c-statistic and the Hosmer-Lemeshow statistic, respectively. Besides the variable acceptance tests during the stepwise regression process, all statistical tests were conducted assuming a 5% chance of a type 1 error.

Results

Of 133 patients (60% Male) (M age = 53.4 y; SD = 14.5), 89 or 67% (95%CI 59, 75) presenting to the specialty clinic had MSNHL with mean FFPTAs of 19.1 dB HL (R; SD = 8.4) and 21.1 dB HL (L; SD = 9.8) and most had moderate or greater tinnitus severity as measured by the THI and TFI. Patients were evenly split between the treatment pathways of hearing aids (49%; 44/89) and cellphone applications (51%; 45/89).

Logistic regression indicated that FFPTA (Left) ($\beta = 0.3899$, $X^2 = 10.96$, $DF = 1$, $p = 0.0009$) and age ($\beta = 0.1273$, $X^2 = 4.86$, $DF = 1$, $p = 0.0274$) were positively associated with HAU; tinnitus severity was inversely related ($\beta = -1.0533$, $X^2 = 4.24$, $DF = 1$, $p = 0.0395$).

Conclusion

About 2/3 of the tinnitus patients had MSNHL. Of those, about 2/3 had “moderate-to-catastrophic” tinnitus as measured by the THI and 1/2 obtained hearing aids, although no one under 40 years of age did so. Hearing aid uptake was positively associated with increasing age and hearing loss, but inversely related to tinnitus severity. These patients represent a special population requiring extensive counseling.

Relevance to Allied Health

All Allied Health professionals encounter patients with complaints of hearing loss or ringing in the ears. Understanding how likely patients with tinnitus have little to no hearing loss can help professionals in Nutrition, Medical Imaging, Occupational and Physical Therapy and Speech Language Pathology to determine most appropriate referral sources.

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DOES FREQUENCY OF ARM AND LEG MOVEMENTS IN INFANTS INFLUENCE GOAL DIRECTED MOVEMENT IN INFANTS LEARNING TO CRAWL?

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Background: Injury to the brain during or immediately after birth is the leading cause of Cerebral Palsy (CP), the most disabling childhood condition. Motor delay and movement paucity are the hallmark of CP during infancy. Research shows that repeated practice is critical for skill acquisition in adults and older children who are able to follow instructions. Because infants are unable to follow instructions, little is known about how efforts to enhance repetition of arm and leg movements may result in skill acquisition of important milestones such as crawling.

Purpose: To assess the relationship between frequency of arm and leg movement and motor proficiency in infants learning to crawl using the Self-Initiated Prone Progression Crawler (SIPPC).

Methods: Twenty eight 5 month old infants who were part of a large study on the SIPPC were videotaped weekly while using the SIPPC for 16 weeks. The videotapes were scored using the Movement Observation Coding System in five minute sessions. The MOCS subscale 2 captures the frequency of infants' specific movements at the hip/knee, foot, and upper extremities and subscale 3 mastery of propulsion in a goal-directed manner. Data Analysis: We used Pearson R to compute determine the relationship between the frequency of movements and goal-directed mastery of propulsion.

Results: The mean scores for subscales 2 and 3 increased from 11.38 and 12.94 at the beginning of the study to 17.62 and 18.86 at the end. The correlation coefficients between the 2 subscales ranged from 0.39 to 0.89 and were statistically significant ($p < .05$). 0.680.

Conclusion: The results indicate a linear relationship between the frequency of arm and leg movements and the emergence of goal directed movements. These findings are consistent with what has been reported in the literature for adults and older children and suggest that robotic technology such as the SIPPC that focuses on increasing practice opportunities for infants may promote skill acquisition in infants.

Relevance to Allied Health: Research shows that crawling is a critical milestones during infancy because it is closely related to the development of social emotional, cognitive, and communication. This makes it an important target for interdisciplinary intervention efforts.

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ELECTROENCEPHALOGRAPHY AND INFANT MOTOR PROFICIENCY DURING DEVELOPMENT OF PRONE LOCOMOTION

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Background: Developmental delays and cerebral palsy (CP) in infants are related to pre-, peri-, or post-natal brain insults. Systematic reviews of early interventions for these infants reveal unsustainable effects while sustainable outcomes are related to changes in brain structure and functioning. These findings underscore the importance of understanding the brain-behavior relationship during infant skill learning. Because CP results from different types of injury to a variety of areas of the developing brain, studying underlying brain changes presents a measurement dilemma. Electroencephalography (EEG) has been used in the past to study brain activity adults and older children. Coupled with its non-invasive application, it is uniquely suited to study the effects of early interventions, or skill acquisition.

Purpose: This exploratory longitudinal study examined changes in brain activity, using electroencephalography (EEG), and motor proficiency in infants during the development of prone locomotion.

Methods: We used a repeated measure design with ten 5 months old infants with typical development that were a part of a larger study on prone locomotion using the Self-initiated Prone Progression Crawler (SIPPC). A high-density EEG (124 channels) was used to record the infants' brain activity during a quiet 5 minutes period followed by training on the SIPPC for 15 minutes. Training involved placing infants on the SIPPC with parents encouraging them to move using toys. The training protocol was also videotaped and repeated weekly up to 12 weeks. We used the videotapes and the Movement Observation Coding System (MOCS) to code motor proficiency on the SIPPC. *Data analysis:* We used repeated measures ANOVA to analyze the MOCS data. EEG power densities were calculated at 1-30 Hz and clustered to define frequency bands. Power densities were plotted spectrally and spatially at a temporal resolution of weekly and monthly averages for longitudinal comparison.

Results: The mean MOCS scores increased from 28 at 5 months to 70 by 8 months. The change score was statistically significant ($p=.03$). EEG results indicated shifts of the frequency boundaries and peak frequency, along the EEG spectrum. Specifically, the mu rhythm in infants was characterized at lower frequencies (6 – 9 Hz) than that of adults. As infants became more proficient on the SIPPC, the peak frequency in the alpha band showed an increasing pattern from 6.6 Hz at 5 months to 7.3 Hz at 7-8 months. Distinct spatial representations were observed for the different frequency bands.

Conclusion: Our findings suggest that the emergence of mu-rhythm peak takes place around 5-6 months of age, earlier than the 7 months reported in the literature, and coincides with the emergence of goal directed prone mobility. The shifts in the alpha frequency band are age specific, raising questions about the previous use of fixed values in research. The findings also support asynchronous development of different cortical regions during infancy.

Clinical Relevance: Our findings have implications for neuroplasticity related to all early interventions. Because the mu-rhythm is associated with inactivity (resting state) while its suppression indicates activity (action) we can study early activity-dependent neuroplasticity with various interventions. The asynchronous development findings suggest that EEG findings may be useful biomarkers for monitoring changes in brain activity in infants with brain insults by other professionals.

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Whole brain irradiation for multiple brain metastases field arrangement to reduce parotid gland dose.

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Background: Whole brain irradiation is the standard of care for patients with multiple brain metastases. The field design of extending to C1 or C2 will affect the dose the parotid gland receives and the risk of loss of salivary function and xerostomia is not known. Improved survival rates have evolved by adding radiosensitizing agents or chemotherapeutics when treating the whole brain with radiation. The parotid glands are not considered as an organ at risk when treating with whole brain irradiation because of the low prescription dose and unfavorable diagnosis. However, a low mean dose to the parotid glands can induce a multitude of symptoms related to salivary function and can cause deterioration of the quality of life in patients treated with whole brain irradiation

Purpose: This study is to explore the dose the parotid gland receives when changing the inferior treatment border to C1 versus C2.

Methods: Treatment plans were made from patients who had multiple brain metastases to a dose of 30 Gy in 10 fractions. The parotid glands mean dose was compared between plans and with Quantitative Analyses of Normal Tissue Effects in the Clinic (QUANTEC) radiation toxicity constraints. QUANTEC recommends the mean dose the parotids can receive is <25 Gy for both glands or a mean of <20 Gy for one parotid gland. In our study, twenty patients had 2 plans created, one plan having the inferior treatment border encompass C1 vertebra and one plan encompassing the C2 vertebra. The mean dose the parotid gland receives during whole brain irradiation is compared between the two plans. Normality assumptions were tested with Shapiro Wilk tests, and parametric or non-parametric statistics were used accordingly. All tests assumed a 5% chance of a type 1 error.

Results: Normality assumptions were not met among the right parotid mean doses and the brain mean doses). However normality assumptions were adequate for left parotid mean doses. Left parotid mean doses were compared among treatment plans paired t-test, and distributions among right parotid doses and brain doses were compared using Wilcoxon-sign rank tests. Mean left parotid dose was 424.5 Gy (95%CI: 296.6, 552.5) lower in plans terminating at C1 compared to those terminating at C2. ($p < 0.0001$). Among plans terminating at C1, the mean right parotid dose was lower compared to plans terminating at C2. ($p = 0.0014$). Right parotid dose median shift was 417.1 Gy (95%CI: 162.3, 663.8) lower among plans terminating at C1, compared to those that terminated at C2. Brain dose among the two treatment plans were not different. ($p = 0.1455$)

Discussion/Conclusions: Whole brain irradiation to the C2 vertebra increases radiation dose to the parotid glands. When treating patients to C1 for whole brain irradiation, the parotid gland dose is low enough for the QUANTEC constraint to be achievable, but when treating to C2 the QUANTEC constraint is not met in all the plans. It is reasonable to consider the parotid glands an organ at risk when treating the whole brain with radiation.

Relevance to Allied Health: These finding have many clinical implications for multiple allied health disciplines in patients who have a low salivary function which can relate to an altered nutritional health based on not being able to swallow because of the parotid glands receiving a toxic dose of radiation.

INSTRUMENTAL ACTIVITIES OF DAILY LIVING TO PREDICT INDEPENDENCE AFTER TRAUMATIC BRAIN INJURY

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Background: As of 2015, 5.3 million people are living with a disability due to a traumatic brain injury (TBI). Common outcome measures used to assess independence during brain injury rehabilitation include evaluation of activities of daily living (ADL) through the Functional Independence Measure (FIM) and evaluation of impairment through the Disability Rating Scale (DRS). Research is starting to show that evaluation of more cognitively demanding instrumental activities of daily living (IADL) can predict independence. However, there is great variation in how to measure IADL functioning and no research has attempted to compare evaluation of IADL functioning to traditional outcome measures to predict independence after a TBI in a post-acute, inpatient setting.

Purpose: The purpose of this outcomes research project was to investigate the clinical question: Does evaluation of IADL functioning predict independence at discharge from a post-acute, inpatient rehabilitation setting following a TBI?

Methods: We conducted a one-group longitudinal study over 8 weeks to examine whether IADL functioning predicts independence at discharge in a post-acute, inpatient rehab for TBI. Inclusion criteria: 1) adults >18 receiving post-acute, inpatient treatment for a TBI; 2) require some assistance with I/ADL. Each participant was evaluated by an occupational therapist using the self-care components of the FIM (bathing, grooming, upper body dressing, lower body dressing, and toileting) on a 7-level ordinal scale (1=dependent, 7=independent) and using the 30-point ordinal scale of the DRS (0=no disability, 29=extreme vegetative state). Participants were also evaluated on 7 IADL (room maintenance, meal prep, laundry, shopping, transportation, medication and money management), using the 7-level ordinal scale of the FIM. The level of independence at discharge was categorized to: home with no help; home with family support; home with hired support; and transfer to another healthcare facility. Multiple linear regression was calculated to predict independence using DRS, self-care, and IADL scores.

Results: Of the participants sampled (n = 7), the mean age was 25 (SD = 5.9), the mean length of stay was 297 days (Range 15 to 903; SD = 346), and 71% were male (5/7). Results of the backward multiple linear regression indicated that DRS (p<0.001) and IADL scores (p = 0.001) were significant predictors of independence level at discharge. Participants' independence increased 0.273 points for every one-point increase in IADL score and 0.444 points for every one-point increase in DRS score, 95% CI for IADL [0.203, 0.344] and for DRS [0.179, 0.709].

Conclusion: There is very little research examining outcome measures in post-acute, inpatient settings for TBI. This study suggests that evaluation of IADL functioning may provide a more complete picture of an individual's independence after a TBI when used in addition to impairment-based outcome measures like the DRS. However, more research needs to be done with a larger sample size to confirm findings. More research also needs to be done to validate ways to evaluate IADL functioning after a TBI.

Relevance to allied health professionals: A better understanding of IADL functioning may help rehab clinicians better understand the discharge needs of patients receiving brain injury rehab. Allied health clinicians use outcome measures to evaluate progress and predict future functioning. Clinicians need to understand that they often cannot depend on a single outcome measure or assessment to understand a patient's independence.

UNRAVELING UNDERLYING MECHANISMS OF 17 α -ESTRADIOL ACTION AND ITS METABOLIC BENEFITS

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Background: Aging unavoidably affects the entire population due to its causal link with several chronic diseases. Many of these diseases are preceded by metabolic perturbations and pro-inflammatory stress, which in turn promote multimorbidity and the onset of frailty. Recent reports also suggest that these aging hallmarks are exacerbated by obesity, which has increased dramatically in older adults over the last few decades. Several studies have reported that weight loss in obese older adults improves metabolic parameters, thereby improving physical function, healthspan, and quality of life. However, current strategies aimed at reversing obesity in older adults involve reductions in caloric intake and/or increased physical activity, despite the fact that these interventions are often not well-tolerated by many due to pre-existing co-morbidities. We and others have previously demonstrated that dietary administration of 17 α -estradiol (17 α -E2), a naturally occurring, non-feminizing, estrogen, improves several metabolic markers associated with obesity and advancing age, including increased median lifespan, reduced adiposity, ectopic lipid accumulation, and circulating pro-inflammatory cytokines, and significant improvements in metabolic homeostasis, all without inducing feminization. The current dogma in the field is that 17 α -E2 elicits its beneficial effects through an uncharacterized receptor, as opposed to traditional estrogen receptors (ER α and ER β); however, this has never been directly tested *in vivo* and proves to be a large hurdle in the way of potential 17 α -E2 clinical application.

Purpose: The purpose of this study was to determine the primary molecular receptor of 17 α -E2 required to induce its beneficial metabolic effects.

Methods: Mice lacking the traditional ER α receptor (ER α KO), as well as wild type (WT) mice, were metabolically challenged via high-fat diet (HFD). Baseline measures were taken, including mass, daily calorie intake, body composition (lean and fat mass %s), fasting glucose, fasting insulin, and HbA1C, before equalizing the groups and treating with either HFD or HFD+17 α -E2 (14.4ppm). Daily mass and calorie intake were measured along with weekly body composition. Post-treatment fasting glucose, insulin, and HbA1C, as well as glucose tolerance testing, were assessed over a period of 3 months, at which point the animals were sacrificed and tissue weights, molecular signaling, inflammation, and histological imaging were analyzed.

Results: Compared to control groups, WT 17 α -E2 treated mice demonstrated reductions in weekly food intake (-5.52g \pm 1.07; NS), body mass (-7.09g \pm 1.54; p < 0.05), and adiposity (adipocyte size -622.4 μ m² \pm 19.9; p < 0.05) with corresponding improvements in metabolic homeostasis as evidenced by declines in fasting glucose (-49.08mg/dL \pm 3.75; p < 0.05), fasting insulin (-3.91ng/mL \pm 0.67; p < 0.05), and improved glucose tolerance. However, no significant improvements were observed in ER α KO 17 α -E2 treated mice for food, mass, or metabolic measures. As expected, there were no significant improvements in WT or ER α KO HFD groups.

Discussions/Conclusions: The beneficial metabolic effects of 17 α -E2 appear to be dependent on the presence of ER α receptors, contradictory to what has been believed for years in the field of estrogen research. However, more work is needed to determine the larger-scale physiological pathways, targets, and requirements of 17 α -E2 action.

Relevance to Allied Health: These findings advance 17 α -E2 one step closer to clinical applications. The wide variety of health benefits provided by 17 α -E2 indicate a promising potential therapeutic agent for many areas of allied health disciplines.

ESTROGEN REGULATES TIGHT JUNCTION PROTEIN EXPRESSION IN THE SMALL INTESTINE

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Background: The decline in estrogen levels during the menopausal transition is associated with increased adiposity, which may be due in part to compromised integrity of the small intestinal epithelial barrier. The influence of estrogen on tight junction protein expression and integrity of the epithelial barrier has been explored in other tissues, but not the small intestine.

Purpose: The purpose of this project is to determine the extent to which estrogen deficiency affects the expression of tight junction proteins in the small intestine.

Methods: Duodenal tissue from 17-week-old Sprague Dawley rats was collected two weeks post-ovariectomy (OVX) with or without exogenous 17 β -estradiol administration (0.5 mg or 1.5 mg 90-day release pellet). Body weights were recorded weekly and prior to tissue collection. Expression of tight junction proteins was assessed via Western blot. Differences between groups in body weight and tight junction protein expression were analyzed via ANOVA using SAS 9.3.

Results: Body weights of OVX rats without exogenous 17 β -estradiol administration were significantly higher than those of the OVX rats receiving either dose of 17 β -estradiol. Expression of tight junction proteins occludin and junctional adhesion molecule A (JAM-A) was significantly up-regulated by both doses of 17 β -estradiol in the duodenum.

Discussions/Conclusions: To our knowledge, the regulation of tight junction proteins by estrogen has not been reported in the small intestine. This study suggests that down-regulation of tight junction proteins may predispose postmenopausal women to pathophysiologies which result from increased intestinal permeability. Future work will focus on elucidating the mechanism(s) by which estrogen regulates tight junction protein expression and how this may contribute to the increased incidence of various chronic inflammation-associated diseases after menopause. Additionally, a future goal will be to identify food components that may attenuate the down-regulation of tight junction proteins expression in this model.

Relevance to Allied Health: Increased intestinal permeability has the potential to predispose postmenopausal women to multiple pathophysiologies, including cardiovascular disease, diabetes and osteoporosis. Elucidating the mechanisms involved in the development of increased intestinal permeability gives Allied Health professionals a deeper understanding of the health status of their patients, while enabling an enhanced level of care to be provided. Nutrition is fundamental to engendering positive treatment outcomes. Incorporating nutrition-related interventions in conjunction to other treatments facilitates the interdisciplinary connection between Dietetics professionals and Allied Health professionals from other disciplines.

Preposition Coding Conventions in the Calculation of Dialect Density for Young African American Children

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Background: When assessing a child for a communication disorder, we must consider whether the child speaks a nonmainstream dialect, such as African American English (AAE), in order to evaluate the child's speech accurately and to not mistake linguistic difference for disorder. We can measure AAE use by counting the occurrence of *contrastive features*, which are the parts of language that differ in use between AAE and Mainstream American English (MAE). In the present study, the contrastive feature of interest is Zero Preposition (coded ZPR). ZPR refers to omission of the prepositions *of*, *at*, and *on* in some contexts where they are required (or *obligatory*) in MAE. For example, in AAE someone may say "The frog jumped out the jar" where in MAE a speaker would say "The frog jumped out of the jar." However, there is a problem with coding ZPR and with coding *of* in particular. MAE also allows *of* to be omitted in some sentences (e.g., "He jumped out the window") but requires *of* in others (e.g., "He jumped out of the jar"). This allowable omission in MAE is referred to as *idiosyncratic* use of the preposition. *Of* by far occurs most frequently of the ZPR prepositions, so *of*'s variability in MAE and in AAE means that the contrastiveness of ZPR is questionable in these contexts. In addition, the rules in the literature for coding ZPR do not differentiate obligatory *of* from idiosyncratic *of*. As a result, researchers are applying the ZPR code inconsistently when coding language samples, which could result in inaccurate measurements of AAE use. To our knowledge this issue has not been addressed in the literature to date.

Purpose: The current study applies two coding methods to the same set of language samples: Total Omissions requires that every *of* omission is counted; Obligatory-Only Omissions requires that omissions are counted only when the context necessitates the preposition in MAE. This study aims to determine if *of* coding method changes how children's degree of AAE use is classified (as high, low, etc.).

Methods: Data for this project came from a series of larger scales conducted by Dr. Moyle. The project was determined to not meet the criteria for human subject research by the IRB at OUHSC. Participants were 113 African American children (32–77 months). Each child had a narrative speech sample recorded and transcribed. These are coded for *of* omissions twice, once using the Omission Total method and once using the Obligatory-Only Omissions. DDM values are calculated for each coding method for each child and will be grouped as either Low (L), Moderate (M), or High (H) groups of AAE use.

Results/Areas of feedback desired: Statistical analyses will be completed in collaboration with Dr. Chen. We will examine the percentage of children who stay within the same group of AAE use (L, M, H) versus the percentage of children who change groups based on coding method. We hypothesize that the classification of AAE use for the children will differ between the Total and Obligatory-Only omission scoring methods, with the Total method showing an increase in group compared to Obligatory-Only. We are particularly interested in feedback on our methodology for this project.

Conclusion: In language assessment, we must distinguish disorder from dialect, yet children's degree of dialect use may be classified differently depending on how *of* is coded as ZPR. This could impact the interpretation of clinical assessments for AAE speakers.

Relevance to Allied Health: The assessment of children from linguistically diverse backgrounds can be difficult due to assessment materials often being designed around MAE's features. In particular, certain features of AAE are susceptible to being mistaken for indications of language disorder if clinicians are unaware of the linguistic differences between AAE and MAE. It is critical for all disciplines to take language differences into account so that appropriate and accurate client assessments can be made.

**A FITNESS-WELLNESS PROGRAM FOR CHILDREN WITH LEUKEMIA:
A CASE-COMPARISON-CONTROL STUDY**

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Background: Acute lymphoblastic leukemia (ALL) is the most common form of childhood cancer. Weakness, fatigue, and decreased physical function resulting in weight gain and other comorbidities have been reported with this disease. The survival rate for individuals with this diagnosis is 85-90% therefore calling to attention the need to address these side effects. Studies show that childhood cancer survivors are more sedentary than their healthy peers for multiple reasons leading to an inactive lifestyle in adulthood. This project aims to educate these individuals and their families on the importance of physical activity to sustain a healthy lifestyle well after therapy has ended.

Purpose: To assess the effect of a weekly structured fitness and wellness program on the strength, endurance, peripheral neuropathy, general health, and psychosocial wellbeing of children with acute lymphoblastic leukemia.

Methods: Case-comparison-control design with three groups of subjects. The case group consists of six children with acute lymphoblastic leukemia (ALL). A comparison group of their “best friends” who will serve as an age-matched comparison of peers who do not have ALL. Both groups will undergo the six-month fitness-wellness program. The control group consists of six children with ALL who cannot participate in the program, but whose daily activity will be monitored along with other outcome measures for comparison. A fourth unit/group of measure is the family of the children with ALL. Pre-and post-intervention measures include bone mineral density, body mass, blood work, sensory assessments, strength measures, functional activity performance, family quality of life, and Hellman’s measures of hope for children and for families. We will also collect qualitative data via focus groups of the children (held as part of the wellness aspect of the treatment) and their families. The children with acute lymphoblastic leukemia (ALL) and their best friends will receive a six-month course of treatment that involves physical exercise and activities, educational programs about fitness, nutrition, and social-emotional wellness delivered at the Tandy Family YMCA Healthy Living Center. The programs will be delivered in once weekly session at the Tandy YMCA and in twice weekly home programs. The control group of children with ALL will not participate in the fitness-wellness programming. Measures taken before, during, and after the treatment will be compared between and among groups.

Results/Areas of Feedback Desired: We hypothesize that a fitness and wellness program using physical activity, social interaction involving the child’s best friend, and education delivered in a fitness facility will reduce the physical and psychosocial effects of treatment for leukemia as gauged by the aforementioned measures. We expect minimal changes in the control group. We anticipate that parents and children in the treatment groups will report qualitatively positive perceptions of the fitness and wellness programs and their observed outcomes.

Conclusion: The YMCA currently has a program with a similar design for an adult population called the LiveStrong® program, but there is not anything set in place for a pediatric population. We recognize that receiving a cancer diagnosis is very similar between populations, but also very different because of the impact that it has on future development of the child and the dynamics of the family. We wish for these individuals to complete therapy healthy with the tools to maintain an active lifestyle, and not only free of leukemia.

Relevance to Allied Health: Physical activity and psychosocial wellbeing is a part of a healthy lifestyle for all disciplines. In addition to occupational therapy and physical therapy disciplines, nutrition students will also be incorporated to educate the participants on the role of a healthy diet. This study will serve as an example of an interdisciplinary team working together to promote a holistic approach to health and wellbeing.

FIDELITY IN RESEARCH

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Background: Research is often dependent on a team member deemed the “coder” to accurately capture data and provide qualitative and quantitative measures that can be analyzed to determine the effects of interventions. Due to the high volume of data gathered through observation, interviews, or video-tapes, research often depends on more than one coder to interpret the performance of behaviors of interest. However, inaccurate coding of data, either among or between coders, could undermine the quality of the data and ultimately the significance of the study findings.

Purpose: This presentation will report on fidelity between two separate coders while using the Movement Observation Coding System (MOCS) to capture infant movement learning on the Self-Initiated Prone Progressive Crawler (SIPPC). Specifically, this presentation will discuss whether inter-rater reliability can be maintained within a complex coding system over time.

Methods: We compared scores that were selected from coders trained on the MOCS. Coders were trained to a reliability standard of ICC greater than .90. To check rater drift and fidelity, a random selection was used to assign research participant data to each coder. Each coder was asked to code 4 participants, then provided a fifth participant that they would both code as a fidelity check. Data analysis: The MOCS is comprised of 4 subscales as follows: Subscale 1: Posture and Support, Subscale 2: Exploratory Selection and Progression, Subscale 3: Mastery of Propulsion, and Subscale 4: Socio-emotional Responses. The first 3 subscale scores are combined to provide an overall motor proficiency score for each particular trial. A Pearson R correlation was run for 8 total trials per participant on each of the 4 subscales as well as the combined motor proficiency score. This provided distinct subscale correlations along with overall reliability measurements.

Results: Correlation coefficients were as follows: Subscale 1: 0.914, Subscale 2: 0.714, Subscale 3: 0.993, and Subscale 4: 0.782. Only two subscales (1 and 3) met the standard criterion of .90 between coders. The coefficient for the total MOCS proficiency score (subscales 1-3) was .922.

Discussion. Overall, the results show sufficient inter-rater reliability between coders for 2/3 subscales, as well as the combined motor proficiency score. The lower reliability for Subscale 2 is expected because of the complexity of capturing frequency data occurring in 4 limbs in a rapid and unpredictable manner. The findings suggest the need for increased fidelity surveillance for Subscale 2. The lower reliability for Subscale 4 is also expected, due to the highly subjective nature of interpreting socio-emotional behavior. Subscale 4 is not included in the overall measure of motor proficiency, but this low correlation does indicate a need for future attention to socio-emotional coding.

Relevance to Allied Health: Many social and biomedical science studies done by disciplines represented in the CAH use observations or interviews to capture performance. The methods and findings of this study provide valuable insight into the benefits and barriers associated with a manual coding system. They also help further the discussion on the importance of rater fidelity to monitor data quality with its ensuing interpretations when more precise technology is not yet available.

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INTER-RATER RELIABILITY OF THE SCHOOL OUTCOMES MEASURE (SOM): A MULTISITE APPROACH

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Background: Inter-rater reliability is imperative when determining the validity of an outcome measure, particularly when establishing a new measurement tool. The School Outcomes Measure (SOM) is a new minimal data set that measures the outcomes of students with disabilities who receive school-based occupational therapy or physical therapy. Currently, the SOM is being validated through a national, multi-center study, with the goal of developing an open access national SOM data system. Ensuring inter-rater reliability in a large, national, multi-site study is vital to decrease rater response variation and necessary prior to data collection and validation of a new tool. If raters are not reliable in their scoring of a measure, then outcomes data collected is invalid.

Purpose: The purpose of this study was to determine the inter-rater reliability of school-based occupational therapists (OTs) and physical therapists (PTs) scoring the SOM and the Pediatric Evaluation of Disability Inventory – Computer Adaptive Test (PEDI-CAT), as part of the SOM validation study.

Methods: OUHSC researchers hired five Scientific Site Coordinators (SSCs), who were therapists from five sites across the U.S. (OK, NM, IL, PA, NY). The SSCs received reliability training and completed reliability scoring at OUHSC, using student videos for both the SOM and PEDI-CAT. When reliable, the SSCs then recruited OTs and PTs (participants) from their sites, trained the participants on the two tools, and collected scores for all participants (N=226) on both tools. The SSCs compiled the participants' scores and sent them to the OUHSC researchers for analysis using the Two-Way Random model with Consistency agreement to compute the intraclass correlation coefficient (ICC).

Results: The ICCs for the SSCs ranged from 0.983-0.999 for the SOM and 0.966-0.993 for the PEDI-CAT. The ICCs for the 226 therapists ranged from 0.988-0.999 for the SOM and 0.929-0.999 for the PEDI-CAT.

Discussions/Conclusions: The inter-rater reliability scores for both the SSCs and the participants were excellent. Establishing inter-rater reliability for all therapists strengthens the generalizability of the research outcomes (in this case, student outcomes). For example, we can assume that the therapists in NM are using and scoring the SOM and PEDI-CAT similar to the therapists in NY, which is important in a national validation study. Establishing inter-rater reliability is the first step in collecting data and validating the SOM, and this study presented an efficient and effective way of collecting reliable scores from participants across the US.

Relevance to Allied Health: These findings have clinical implications for all allied health disciplines who are involved in multi-site studies. Although training many raters across the country can be a deterrent for large, multi-site trials, this study demonstrates that successfully training site coordinators to train participants in their locations can be an effective way to train a large number of evaluators on a measurement tool without sacrificing researcher time and maintaining excellent inter-rater reliability.

THE EFFECTS OF SOCIO-EMOTIONAL WELLBEING ON MOTOR PERFORMANCE IN YOUNG INFANTS

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Background: Physical therapy intervention is often largely dependent on the receptivity and motivation of the participant for success. This is particularly more important when providing physical therapy intervention to promote skill acquisition in infants whose performance on any task is behavior-driven. The contribution of infant behavior to healthy infant-caregiver relationships and ultimately later optimal developmental outcome has been well studied. How this attribute contribute to the development of motoric and early exploration skills such as crawling during infancy is less understood.

Purpose: The purpose of this pilot study is to determine the relationship between the infant's social emotional behavior— both positive and negative— and motor performance.

Methods: Six infants who were part of a larger study on the Self Initiated Prone Progression Crawler (SIPPC) project, were selected for analysis. The infants, 5 months old at the beginning of the study, were placed on the SIPPC and encouraged to use it to move towards toys. Parents encouraged the infants and the bi-weekly training sessions, which lasted 16-20 weeks, were also videotaped. We used the videotapes and the Movement Observation Coding System (MOCS) to code the infant's socio-emotional behavior during the training sessions (Subscale 4) and motor proficiency (composite total score from subscales 1-3). Items on the MOCS subscale 4 deduct 1 point from the overall socio-emotional score for every 30-second period that the participant is crying or irritable. Within each 5-minute standardized trial, ten 30-second increments occur.

Data analysis: Scores from the total subscale 4 were correlated with the total motor proficiency score using Pearson R.

Results: The mean scores for Subscale 4 increased from 10.48 at the beginning of training to 23.22 at the end. Similarly, the mean motor proficiency score increased from 16.14 at the beginning to 18.93 at the end. The correlation coefficient between the two subscales at the beginning of training was 0.10 and 0.17 at the end.

Discussion: The results reveal a close connection with an infant's social emotional status and efforts to move. Initially infants scored low on both subscale 4 and the composite motor proficiency score, suggesting that they were more irritable and moved the SIPPC very little. On the other hand, infants who scored high on subscale 4 also scored high on motor proficiency scale and moved more. The latter was also observed more as the infants grew older and interacted more with toys, suggesting the need for future studies to tease out the effect of maturation. It is not clear from this analysis which comes first, movement proficiency or high socioemotional status.

Relevance to Allied Health: Infant intervention is challenging to implement within any discipline due to the limited communication skills available to the infant and may biological factors that make behavior unpredictable such as hunger, teething, or mild ear infections. Research and practice, as well as current and future practitioners, could gain valuable insight on their infantile interventions and infant cooperation by better interpreting socio-emotional behavior and understand its correlation to treatment.

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A Fitness-Wellness Program for Children with Leukemia and their Best Friends: A Case-Comparison-Control Study

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Background: Acute lymphoblastic leukemia (ALL) is a disease that affects the white blood cells of the body. Children who are treated for ALL have an increased rate of chronic diseases, including: cardiopulmonary issues, musculoskeletal problems, impaired neurological function, obesity, secondary malignancy, impaired growth and development, endocrine dysfunction, cognitive dysfunction.¹ Past literature shows use of physical activity interventions on children recovering from ALL, but not both physical activity and nutrition interventions. This proposal will include a six-month fitness and wellness program that involves patients that have been treated for ALL and their “best friends” to measure the effects of a nutrition and fitness intervention on the physiological health effects of treatment for ALL. This will be compared to patients who are also on maintenance treatment for ALL, but not participating in the wellness program.

Purpose: The goal of this program is to implement a health and wellness intervention to see if there is a change in factors that indicate these chronic diseases.

Methods: Six participants and their “best friends” will receive a six-month course of treatment that involves physical exercise and activities, educational programs about fitness, nutrition, and social-emotional wellness delivered at the Tandy Family YMCA Healthy Living Center. Another six participants who can not make it to the Tandy Family YMCA will receive weekly handouts and challenges. The best friends will serve as a non-treatment group while the 6 participants with ALL that are not attending the YMCA classes will serve as a control. Pre-and post-intervention measures include bone mineral density, body mass, blood work, sensory assessments, strength measures, and functional activity performance.

Expected Results: We expect to see a decrease in the chronic risk factors that we are measuring. This will be determined by using the data collected at the beginning of the study, the weekly measures, the mid-point measures, and the end point measures. These will be compared with a hope of overall decrease in levels.

Since this is a pilot study, we only have 6 ALL patients receiving the intervention. In the future, we hope to increase this number and maybe include other children in remission with the same chronic risks. This data can also be used as an educational resource. The nutrition folder can be passed out for all children in remission with the hope of educating not only the children, but also the parents. This will decrease the families overall risk for chronic diseases.

Relevance to Allied Health: The combination of physical activity and nutrition as an intervention for children with ALL can be applied to other children in remission with similar chronic risks. The interdisciplinary aspect will also be a useful example of how to use different specialties to improve patient’s well-being.

MEANINGFUL EMPLOYMENT FOR ADULTS WITH A DISABILITY

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Background: Maintaining employment provides an opportunity for people to engage in an important occupation that leads to greater independence through financial gain, personal responsibility, and increased social interactions. Meaningful employment allows people to pursue an occupation that provides the added reward of choosing work in which you are interested. National statistics show there is a 41.1-point disparity in the rate of employment between individuals with a disability and those without (Kraus, L, 2017). Many studies are dedicated to identifying the personal barriers that persons with a disability face regarding employment. There are fewer articles examining the environmental factors related to employment for people with disabilities. In a news release from the Bureau of Labor of Statistics (2013), 80.5% of unemployed Americans with disabilities stated that their own disability was a barrier they experienced with employment. In the same report, 41% of respondents reported no difficulty fulfilling their work requirements (2013).

Purpose: The purpose of this study was to examine the influence of employers' perspectives on hiring of persons with a disability. We hypothesized that negative perspectives, specifically regarding performance, contribute to lack of employment for persons with disabilities.

Method: We surveyed 29 eligible individuals who make hiring decisions for businesses of various sizes and industries in the United States with questions requiring Likert scale responses (where 1 = strongly agree and 7= strongly disagree) and an opportunity for open comment. Of those who completed the survey, 17.2% had never employed a person with a disability. For the purpose of this study, "disability" was defined as a physical or mental impairment that limits a person's ability to perform tasks and participate in activities. We also interviewed Oklahoma businesses who have (n=3) and have not (n=1) hired persons with a disability and an employment support service for persons with a disability. Interviews were conducted via phone, email, or in-person following a semi-structured format. Transcripts were coded to identify positive/negative statements regarding hiring persons with a disability and positive/negative statements related to task performance by persons with a disability.

Results: Survey results showed that, overall, people generally agreed (M: 2.14 (Agree); SD: 1.31) with the positive perspective of statements regarding employing persons with a disability. Independent, two-tailed t-tests showed no statistically significant difference ($p > 0.05$) in the perspectives of employers who have and have not hired a person with a disability in all but one statement ("persons with a disability require more direct supervision than persons without a disability;" $p = 0.05$). Interview results consisted of 16 positive statements out of 27 coded about hiring persons with a disability. This study was limited by a very small sample size and a difficulty in identifying willing participating businesses that have not hired individuals with a disability.

Discussions/Conclusions: In general, persons in the position to make employment decisions seem to not maintain negative perspectives regarding task performance when considering employing persons with a disability. Notably, the comments from the only business interviewed that has not hired a person with a disability focused solely on task performance, however overall perspectives do not support the hypothesis. Survey comments and interview responses point to a willingness to match job tasks to applicant skills with reasonable modifications, but businesses may lack an awareness of resources specific to task accommodation and financial resources to support environmental modifications.

Relevance to Allied Health: Lack of awareness, specifically regarding resources for task and environment modification/accommodation, contributes to lack of employment for persons with a disability. Varied Allied Health perspectives and expertise are well-suited to consult with businesses and individuals and provide recommendations for appropriate environment and task modifications.

EFFECTIVENESS OF OCCUPATIONAL THERAPY ON FUNCTIONAL INDEPENDENCE FOLLOWING PEDIATRIC NEUROLOGICAL INJURY

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Background: The annual incidence of neurological injuries resulting in hospitalization or death was 155 cases per 100,000 persons; the mortality rate was six people per 100,000 persons per year. In a study of patients admitted to The Children's Hospital of Philadelphia rehabilitation unit, traumatic neurological events made up 44.6% of diagnoses. Occupational therapists are frequently part of interdisciplinary teams addressing impairments caused by traumatic injury. The role of occupational therapy (OT) is to improve quality of life and functional performance through participation in meaningful activities.

Purpose/Hypothesis: The purpose of this study was to investigate the clinical question: *Does receiving occupational therapy following a traumatic neurological event increase functional independence in children upon discharge?* We hypothesized that utilizing OT interventions as part of an interdisciplinary program would increase functional independence in children admitted to a pediatric medical rehabilitation unit (PMRU) following a traumatic neurological event.

Methods: A one-group longitudinal study was conducted to examine the effects of OT in a PMRU over six weeks. A convenience sample of children designated to the fieldwork educator's (FWE's) caseload was recruited. Patients were evaluated to determine the appropriate duration and frequency of warranted OT services. A 2nd-year OT student (OTS-2) in Fieldwork II facilitated OT interventions under the FWE's supervision. Interventions included occupation- or play-based activities, preparatory activities, and a coma stimulation program with attention to range of motion. Children received other education, medical, and rehabilitation services as needed. Outcomes measures included the Functional Independence Measure for Children (WeeFIM), an observation-based measure of performance, rated on a 7-point ordinal scale (1 = Total dependence; 7 = Total independence). To measure independence in patient- and family-prioritized goals, the Canadian Occupational Performance Measure – Performance score (COPM-P), an interview-based measure used to identify goals and rate performance on a 0-10 scale, was used. Data was analyzed using descriptive statistics and paired t-tests.

Results: Of the participants sampled (n=6), the mean age was 11.5 years (SD: 4.42), 50% were female, 50% white, 33% black, and 17% Hispanic. All participants were recovering from neurological trauma with diagnoses of: spinal cord injury (3/6), traumatic brain injury (2/6), and stroke (1/6). The mechanism of injury involved a vehicle in 83% of cases and was unknown in one case. Half of the participants participated in a combination of occupation- and play-based interventions and preparatory activities, 33% participated in occupation- and play-based interventions only, and one participant participated in a coma stimulation program. The post-intervention WeeFIM mean (M=53.5; SD: 17.62) was significantly higher (p=0.03) than the baseline mean (M=33.5; SD: 27.94). The post-intervention COPM-P mean (M=5.2; SD: 2.59) was significantly higher (p=0.015) than the baseline mean (M=1.4; SD: 0.55).

Discussion: OT interventions seem to affect positive change in functional independence following pediatric neurological injury. Future research should delineate OT's specific contribution to pediatric rehabilitation with a dismantling study of the interdisciplinary approach. Future research emphasizing the value of occupation- and play-based interventions vs. preparatory activities would contribute to practice guidelines. Limitations of this study included a small sample size, short timeframe, and an inability to control for severity of injury, prognosis, and the contributions of natural recovery and other interventions.

Relevance to Allied Health: Many allied health professionals are included in the interdisciplinary team in a PMRU. Knowledge of the distinct value of OT can improve a patient's comprehensive care and communication amongst team members.

SPEECH-LANGUAGE PATHOLOGISTS' ASSESSMENT PRACTICES FOR PRESCHOOL-AGE AND EARLY SCHOOL-AGE CHILDREN WHO STUTTER

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Background: Stuttering can have a profound negative effect on preschool-age children who stutter (CWS) and their families. From a very young age, children tend to appraise stuttering negatively, and sometimes they interrupt, mock, and walk away from CWS. Also, some CWS may be anxious about communicating and report low self-esteem. Furthermore, stuttering can have a negative impact on the siblings and the parents of CWS. For example, siblings of CWS may feel a heightened sense of responsibility to protect their sibling, and experience negative emotions about their sibling's stuttering such as embarrassment and frustration. Effects on CWS's parents often include high stress, anxiety, feelings of guilt, and concern about their child's future.

These above findings highlight the need for speech-language pathologists (SLPs) to acknowledge the potential impact that stuttering might have on young CWS and their families and hence explore it during the typical diagnostic/assessment process. However, most available diagnostic tools, with the exception of the *Palin Parent Rating Scale* and the informal questionnaire "*The Impact of Stuttering on Preschool Child and Parents*" are designed to assess only the overt/observable stuttering behaviors and fail to address the impact of stuttering on the child and the family.

Purpose: The purpose of this study is to investigate whether Speech-Language Pathologists assess the impact of stuttering on preschool-age CWS and their families and inquire about the (in)formal measures (e.g., Palin PRS, informal questionnaire) they use to do so.

Method: The study will be conducted via a 30-question electronic survey (designed in REDCap), the link of which will be distributed to SLPs in the United States, Canada, United Kingdom, Australia, New Zealand, through their professional organizations.

Expected Results: Findings are expected to reveal that only a small percentage of SLPs use (in)formal measures to assess the impact of stuttering in young CWS and their families.

Conclusion: Our study will help determine if the impact of stuttering in preschool age children is being assessed, and what tools are most commonly used in the assessment process. This study is a starting point for future research involving stuttering in preschool age children.

Relevance to Allied Health: This research can help Speech-Pathology clinicians know what tools and practices are being used around the world to assess stuttering. It is important for professionals in any allied health field to be aware of current practices. Staying up to date on treatment and evaluation practices being used or not being used by varying clinicians is essential to being able to provide the best care.

THE EFFECT OF AAE DIALECT USE ON ASSESSMENTS OF PHONOLOGICAL AWARENESS IN PRESCHOOL

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Background: There is a persistent gap in reading achievement across socioeconomic and cultural groups including African American children living in poorer communities. Children's early reading skills are often assessed using tests of phonological awareness (PA) which is the awareness of speech sounds in spoken language. These tests are considered to be a good predictor for many later reading problems. A test that has become popular relatively recently is the *Phonological Awareness Literacy Screening for Preschool* (PALS-PreK) which assesses some specific skills of phonological awareness (PA). One issue with the PALS-PreK, however, is that lower scores have been found to be associated with greater use of a Non-Mainstream American English (NMAE) dialect. Still, it remains unclear what the relationship is between the use of African American English (AAE), a specific NMAE dialect, and PALS-PreK scores. Previous research has shown that children who use more AAE in their spoken language are more likely to demonstrate lower PA skills. Moreover, children living in poorer communities typically use AAE more frequently than peers in wealthier communities. Therefore, this is an important question because the PALS-PreK was developed using Mainstream (i.e., academic) English. Furthermore, there are relatively few studies on PA development in AAE-speaking children of preschool-age, an age during which PA should typically start to emerge.

Purpose: The aim of this study is to determine the relationship between AAE use by African American preschoolers from low socioeconomic backgrounds and their performance on PALS-PreK subtests.

Methods: Data for this project came from a series of larger scales conducted by Dr. Moyle. The project was determined to not meet the criteria for human subjects research by the IRB at OUHSC. Participants consisted of 37 typically developing African American preschool children from low-income households, ages 36 to 64 months. The amount of AAE dialect used in their spoken language was assessed using a dialect density measure (DDM). To do this, narrative speech samples were recorded, transcribed, and coded for grammatical features of AAE. Three subtests from the PALS-PreK (Beginning Sound Awareness, Rhyme Awareness, and Nursery Rhyme Awareness) were used as a measure of PA skills.

Results: A correlational analysis was conducted in collaboration with a statistician with DDM values and raw scores for the three subtests examined. Analysis revealed a significant negative relationship between DDM and Nursery Rhyme subtest scores ($r = -0.43, p < .01$) but a nonsignificant relationship between DDM and Beginning Sound Awareness scores ($r = -0.11, p = .53$) and Rhyme Awareness scores ($r = -0.15, p = .38$).

Conclusion: We found a relationship between DDM and Nursery Rhyme subtest scores in that higher AAE use was associated with lower scores on this subtest. We did not find a significant relationship between DDM and scores for the other two PALS-PreK subtests. The fact that we found a negative relationship for one subtest but not for the others suggests that performance on the Nursery Rhyme subtest may be influenced by AAE use in a way that is not a factor for the other subtests. Therefore it is important to consider AAE use when interpreting Nursery Rhyme scores for children who use AAE.

Relevance to Allied Health: Allied health professionals must consider cultural and linguistic characteristics of the children they work with during assessment and intervention.

Integration of 3 Outcome Measures for Movement Learning in an Infant using the Self-Initiated Prone Progression Crawler-3 - Case Report.

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Background: Cerebral Palsy (CP) is a multifactorial condition that affects various domains of development in children such as motor, communication, cognition, and vision. Research shows that the underlying impairments associated with CP are complex and interrelated but that movement incoordination and execution, dysfunctional postural control, are more negatively impacted than other areas. Very little is understood about the nature of interplay between biomechanical and neural changes that contribute to motor skill acquisition in these children.

Purpose: To determine the relationships among changes in biomechanics, skill acquisition, and neural activity in infants learning a motor skill. More specifically we examined the relationships among changes in accelerometer-based kinematics, movement proficiency scores, electroencephalography (EEG) in one infant during the development of prone locomotion.

Case Description/ Measures: Infant A, at risk for CP was enrolled into the study at 4 months. The infant was part of a larger study on the Self -Initiated Prone Progression Crawler-3 (SIPPC-3), a robotic system intended to promote crawling and simultaneously gather kinematic and movement data.

The infant trained on the SIPPC-3, 2 times a week for 15 minutes over a period of 4 months. Training involved placing the infant on the SIPPC-3 and parents encouraging movement with toys placed in front of the infant. The training sessions were videotaped. The infant also donned an EEG sensor net (124 channel) at the beginning of each training session to gather resting data (for 5 minutes) and data during training on the SIPPC. Crawling movement efforts and changes from video data were coded using the Movement Observation Coding System (MOCS). Kinematic data from the SIPPC limb mounted accelerometers were recorded and uploaded on to the laptop via the SIPPC controller. Data analysis: We used descriptive data and graphs to analyze data from the 3 performance measures over time.

Results: Movement proficiency scores from 67 at the beginning of the study to 84 at the end. Distance travelled by infant on the SIPPC-3 increased from 1.28m to 1.63m over the 4-month period. Path lengths velocities of both arms and legs also showed an increase over time. Similarly, spectral analysis of EEG data during wakeful attentive rest showed a shift in the alpha frequency band from 5-6 Hz to 6-8 Hz. The data plots of the scores at each monthly interval revealed a few time lags in change scores.

Discussion: The results showed that changes in postural control preceded changes in movement proficiency and shifts in the alpha frequency band, but occurred simultaneously with changes in the arm and leg movements. Because the mu rhythm is contained in the alpha frequency band and represent movement execution, the results of the shift to higher frequency suggest that the mu rhythm may provide information about neuroplasticity. The increasing linear path length of the SIPPC indicated a shift toward more proficient and goal directed movement on the SIPPC. These findings from the data generated by the SIPPC may open the door to understanding the complex and multifaceted interaction of factors contributing to skill acquisition in infants with CP.

Relevance to Allied Health: Optimal functional performance is the end goal of the interventions provided by the various disciplines represented in Allied Health. Because human performance in daily life is multifaceted, this case provides an example of how new technology can inform assessment of intervention outcomes.

PERCEPTION OF DANCE-RELATED PAIN AND INJURY AND DANCERS' UTILIZATION OF ALLIED HEALTH PROFESSIONALS: SURVEY

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Background: The prevalence of injury among ballet dancers has not changed since it was first investigated in 1969. Most injuries sustained by adolescent female ballet dancers coincide with the time they start dancing *en pointe* (standing on the toes in pointe shoes at maximum ankle plantarflexion), typically at 11 years of age. Epidemiologic studies report the majority of injuries involving adolescent ballet dancers occur between 12 and 18 years of age. Yet, no validated frameworks exist to predict the factors that may predispose ballet dancers to injury or training regimens required to prepare the dancer for dancing *en pointe*. Little is known about how instructors and dancers perceive and manage injuries or if these perspectives differ between the two groups.

Purpose: The purpose of this study is to 1) gain an understanding of training regimens and perception of dance-related pain and injury among ballet dance instructors and dancers *en pointe*, and 2) determine the utilization of allied health professionals for evaluating and treating dance-related injury.

Methods: The IRB-approved survey was nationally distributed through snowball sampling, targeting ballet instructors and dancers *en pointe*. Study data were collected and managed using REDCap (Research Electronic Data Capture). The Wong-Baker Faces® Pain Rating Scale and frequency scales were used to report perception of dance-related pain and injury. Data were analyzed using descriptive and non-parametric analyses.

Results: Seventy-one instructors and 131 dancers completed the survey. The proportion among dancers reporting dance-related pain/injury is greater than instructors perception: 94% (99%CI:88.5,99.3) and 72% (99%CI:58.1,85.6), respectively ($X^2=18.77, Df=1, p<0.0001$). Seventy-eight percent of dancers reported they can dance in pain compared to 26% of instructors who perceive their dancers can dance with pain ($X^2=40.1, DF=1, p<0.0001$). Ninety-six percent of dancers reported rarely/never seeking medical care following a dance-related injury; 65% of instructors report their dancers rarely/never seek care ($X^2=29.5, Df=1, p<0.0001$). Dancers perceive they should stop dancing when experiencing a median pain level of 6/10 to prevent further injury; yet, they report it is not appropriate to replace a dancer until reaching 8/10 and 10/10 pain levels during rehearsal and performance, respectively. Instructors perceive the dancer should stop at a median pain level of 5/10 to prevent further injury and reported it is appropriate to replace a dancer at a median pain level of 6/10 for both rehearsal and performance. When determining pointe readiness, 90% of instructors reported that they decided pointe readiness; 9% reported physicians determined pointe readiness; and, 1% use "other" personnel (e.g., head ballet mistress). No dance instructors reported that physical therapists determine pointe readiness. Dancers reported similar results, except that 1.5% reported a physical therapist was involved in pointe readiness screening.

Discussions/Conclusions: Results reveal disparity in perception of dance-related pain and injury between dancers and instructors and underutilization of allied health professionals. These results substantiate further study into the perpetuating unhealthy habits of dancing with injury and an unwillingness of dancers to report pain and/or injury with their instructor or medical specialist. Dancing through pain and injury should be explored as possible confounding variables to factors related to the unchanging injury rates among female ballet dancers.

Relevance to Allied Health: There is an extreme underutilization of physical therapists serving this young, developing cohort of performing artists. Allied health professionals must establish evidence-based factors that are important in determining pointe readiness. Screening tools must be developed for young dancers for pointe readiness like established for sport-specific areas (e.g., baseball) and should include psychosocial aspects of managing pain and injury by occupational therapists. Imaging professionals would benefit from knowing injuries that are unique to the dance population so as to provide the appropriate imaging techniques to assist rehabilitation providers with necessary information to guide intervention.

OUTCOME MEASURES USED IN ACUTE CARE BY OCCUPATIONAL THERAPIST

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Background: Acute inpatient hospital settings are characterized by a fast-paced, short period of hospitalization. The particular challenges to occupational therapists working in acute inpatient hospitals are a limited number of therapy visits and quick discharge. Occupational therapists (OT) use standardized assessments in different settings to help inform colleagues and other medical professionals of the complexity of the patient's diagnosis, functional level, and aid in safe and effective discharge planning. Based on the current literature, there is significant variability in the use of standardized assessments to measure occupational therapy outcomes at the time of discharge from the acute inpatient hospital.

Purpose: The aim of this study was to identify the outcome measures used by OT in acute inpatient hospital settings, and to explore factors that impact the use of outcome measures.

Methods: In this study, we retrospectively examined and analyzed datasets from occupational therapy students' level two fieldwork experiences. Before their fieldwork, we asked students to create a dataset of all the patients they worked with over an 8 week period time during summer 2017. Students recorded a range of individual characteristics (e.g., age, gender, race, educational level and diagnosis) and length of stay into an Excel data base. The students chose at least one outcome measure used in the facility and documented the baseline and final performance after therapy on the outcome measure. The students avoided documenting any protected information as designated by HIPPA identifiers.

Results: Out of the 32 second year OT students, seven of them complete fieldwork at six acute inpatient hospital settings providing OT for 205 patients, including 99 male and 106 female patients with an average age of 63.29 ± 15.86 . The average length of stay was 6.60 ± 7.43 days (this was calculated based on 146 patients with documented length of stay). In all six settings, OT students provided ADL training (bathing/showering, toileting and toilet hygiene, dressing, functional mobility, personal hygiene and grooming). Other OT services included IADL (care of others/pets, health management and maintenance, meal preparation and clean up), formal/informal patient education, practice and simulation activities, preparatory tasks, exercises, rest and sleep, play, leisure and social participation, and assistive technology. The outcome measures used by the students included: modified Functional Independence Measure (two settings), the Functional Independence Measure (one setting), the Boston University "6 click" AM-PAC (one setting), and the Canadian Occupational Performance Measure (one setting), Self-reported goals by patients (one setting). Only three settings documented both baseline and final outcome measurement data. Two settings complete only baseline evaluations and one recorded only the baseline goals. Factors that impact the use of outcome measures include: challenges selecting the appropriate outcome measure; too time consuming for patients to complete and difficult to complete independently, the short length of stay, limited time for therapists to complete the evaluation, fast paced and dynamic environment (different floors, different teams/members), timing problems where patients were undergoing tests/procedures, were off the floor, and/patients were medically unstable at the time of the attempted/scheduled evaluation.

Conclusion: By not using standardized assessment tools, the value and benefits of OT services, such as ADL and IADL training, patient and caregiver education, and training to use adapted equipment/assistive devices is anecdotal at best. Further research is needed to identify common outcome measures suited for use by OTs in acute inpatient hospital settings. OTs need easy access to information about the clinical utility and psychometric qualities of various measures to help with the appropriate selection and clinical applicability of standardized assessment tools to measure functional outcomes in acute inpatient hospital practice.

Relevance to Allied Health: With the acuity of patients and the complexity of their problems, most will be served by multiple professions requiring a strong team approach. Determining the effectiveness of occupational therapy in combination with the services provided by other health care disciplines, will increase the visibility and clarify the distinct value of the OT as an important member of the interprofessional team, solidifying team collaboration and improving patient outcomes.