College of Health Sciences Research Day
Poster Presentation Abstracts

#183 Abstract Title:	**Combination of Eccentric Exercise and Neuromuscular Electrical Stimulation to Improve Knee Mechanics Post-ACL Reconstruction**
Author(s):	L.K Lepley, Dept of Rehabilitation Sciences, U of Kentucky; School of Kinesiology, U of Michigan E.M. Wojtys, Dept of Orthopedics, U of Michigan R.M. Palmieri-Smith, School of Kinesiology and Dept of Orthopedics, U of Michigan

Abstract: We have previously reported that an eccentrically based rehabilitation protocol post-anterior cruciate ligament reconstruction (ACLr) induced greater gains in quadriceps volitional muscle activation and strength than a neuromuscular electrical stimulation (NMES) intervention. However, the effect an eccentrically based intervention has on restoring normal knee mechanics remains unknown. Purpose: To evaluate the effects of a combined NMES and eccentric exercise intervention on knee mechanics post-ACLr. Participants: Thirty-six individuals post-injury were placed into four treatment groups (N&E, NMES and eccentrics: n=8; E-only, eccentrics-only: n=8; N-only, NMES-only: n=10; STND, standard of care: n=10) and ten Healthy controls participated. Interventions: All ACL patients, regardless of group, received the standard of care post-ACLr. N&E received a combined NMES and eccentric protocol post-reconstruction, whereas groups N-only and E-only received only the NMES or eccentric therapy, respectively. Methods: Sagittal plane knee mechanics were evaluated at return-to-activity during a single-legged landing task. To evaluate knee mechanics, the area under the curve during the first 50% of stance for knee flexion angle and extension moment was derived and normalized to the contralateral limb to create limb symmetry indices (LSIs). One-way ANOVAs were utilized to compare LSIs differences between groups with post-hoc Bonferroni procedures where appropriate. Results: Compared to Healthy, reduced sagittal plane knee extension moment LSIs were found for groups N-only (P=0.020), E-only (P=0.004) and STND (P=0.005). No difference was detected between Healthy and N&E (P=0.060). N-only tended to demonstrate lower knee flexion angle LSI as compared to Healthy (P=0.083). No other significant post-hoc differences were observed (P>0.05). Conclusions: N&E was found to restore sagittal plane knee limb symmetry better than the N-only, E-only or the STND post-ACLr. An eccentric intervention lasting longer than six weeks may be beneficial, as this therapy was found to be the driving factor behind strength gains in our previous work, and ACLr patients with less side-to-side strength deficits were able to demonstrate movement patterns that more closely resemble their non-injured limb.

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Primary Presenter / email: Lepley, L.K. / Lindsey.Lepley@uky.edu
Postdoc
Division of Athletic Training

Mentor / e-mail: Butterfield, T.A. / Tim.Butterfield@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#184 Abstract Title: **Chronic Ankle Instability Alters Corticospinal Inhibitory Functions and Postural Control Variability**

Author(s): M. Terada, Dept of Rehabilitation Science, U of Kentucky
P.A. Gribble, Dept of Rehabilitation Science, U of Kentucky

Abstract: Objective: Investigate the influence of chronic ankle instability (CAI) on central nervous system (CAI) excitability and postural control variability, and evaluate correlations between CNS excitability and postural control variables in CAI participants. Design: Case-control study. Participants: Sixteen participants with self-reported CAI and 17 healthy control participants volunteered. Main Outcomes: Approximate Entropy (ApEn) and mean of time-to-boundary (TTB) minima in each direction were calculated for postural control variability. Spinal-reflex excitability of the soleus was assessed using the peak-to-peak amplitudes for the maximal H-reflexes and muscle responses (Hmax:Mmax ratio). Active motor threshold (AMT) and the ratio of the cortical silent period (CSP) to the motor evoked potentials (MEP) (CSP:MEP) were used as corticospinal excitatory and inhibitory outcomes. Independent t-tests were used to assess group-differences in each dependent variable. Pearson product moment correlations were used to assess the relationship between postural control and neural excitability measures. Significance was set a priori at $P<0.05$. Results: The CAI group demonstrated significantly lower H:M ratio ($P=0.04$) and TTB values ($P<0.04$), as well as greater CSP:MEP ratio ($p=0.02$) and ApEn values ($P=0.02$) compared to the control group. No significant group differences were observed for AMT ($P=0.67$). There were no significant correlations of CNS excitability outcomes with postural control variables ($P>0.05$). Conclusion: Participants with CAI demonstrated increased corticospinal inhibitory functions compared to control participants. The CAI group showed the inability to control COP oscillations respect to boundaries of the base of support. Targeting these changes in CNS excitability and postural control variability may benefit for patients with CAI. However, levels of CNS excitability and postural control variability were not correlated with each other in CAI participants. Future investigation should consider how best to conduct these CNS excitability assessments during functional tasks.

Supported by: N/A

Primary Presenter / email: Terada, M. / masafumi.terada@uky.edu
Postdoc
Division of Athletic Training

Mentor / e-mail: Gribble, P.A. / phillip.gribble@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#185 Abstract Title:	**High-throughput analyses identify microRNAs and gene targets that are differentially regulated in adipose tissue of insulin sensitive versus insulin resistant humans**
Author(s):	R.G. Walton, College of Health Sciences, U of Kentucky T.J. Kirby, College of Health Sciences, U of Kentucky B.S. Finlin, Dept of Medicine, Div of Endocrinology, Barnstable Brown Diabetes and Obesity Center B. Zhu, Dept of Medicine, Div of Endocrinology, Barnstable Brown Diabetes and Obesity Center R. Unal, Dept of Medicine, Div of Endocrinology, Barnstable Brown Diabetes and Obesity Center P.A. Kern, Dept of Medicine, Div of Endocrinology, Barnstable Brown Diabetes and Obesity Center C.A. Peterson, College of Health Sciences, U of Kentucky

Abstract: Background: MicroRNAs are small noncoding RNAs that decrease translation by cleavage or destabilization of mRNA. In adipose tissue, microRNAs have been shown to affect differentiation, metabolism, and adipokine production. We hypothesized that insulin resistant humans would display dysregulated microRNA expression, and that alterations in microRNA expression would ultimately lead to changes in mRNA target gene expression. Methods: Subcutaneous adipose tissue biopsies were obtained from 31 insulin sensitive (IS) and 31 Insulin resistant (IR), patients matched for BMI. RNA was extracted and used for Human Whole Genome 4 x 44 k arrays (Agilent Technologies). Another set of human subcutaneous adipose sample (N=26 total, N=16 for whom we also had whole genome arrays) was used to compare microRNA expression in IS versus IR matched for BMI. Differentially expressed mRNAs and microRNA s were imported into Ingenuity Pathway Analysis for target identification, and microRNA-mRNA interactions were identified using the microRNA Target Filter for both experimentally validated and predicted interactions. Next we identified microRNA-mRNA pairs that were oppositely correlated with insulin sensitivity (Si), as well as mRNA and microRNA expression from paired samples demonstrating a negative correlation. Results: Seventeen microRNAs were significantly different between IS and IR ($P<0.01$), with 94% of these showing lower mean expression in IR. MicroRNA-mRNA interaction analyses identified 4 microRNAs (has-mir-26b, hsa-mir-30b, has-mir-30c, and has-mir-145) that were positively correlated with Si while their gene targets were negatively correlated with Si. Ongoing in vitro studies will determine whether predicted microRNA gene targets can be modulated by microRNA overexpression. Conclusion: microRNA expression is different in IR compared to IS subjects and these alterations are likely to promote changes in protein expression. These pathways may contribute to poor adipose tissue function in IR subjects, and may constitute viable pharmacological targets.

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Primary Presenter / email: Walton, R. Grace / r.grace.walton@uky.edu
Staff
Department of Rehabilitation Sciences

Mentor / e-mail: Peterson, Charlotte A. / cpete4@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#186 Abstract Title:	**Average Swing Volume During Practice and Competition in Collegiate Volleyball Athletes**
Author(s):	K.L. Poole, UK Athletics, U of Kentucky H.M. Wolfe, Dept of Rehabilitation Sciences, U of Kentucky J.B. Hannah, Kinesiology and Health Promotion, U of Kentucky T.L. Uhl, Dept of Rehabilitation Sciences, U of Kentucky

Abstract: Context: The repetitive overhead swinging motion performed in volleyball may be one of the causes of frequent shoulder overuse injuries observed in the sport. Unlike baseball where pitch volume is closely monitored as a known risk factor, limited information exists on the number of overhead swings occurring in volleyball. Objective: This study recorded the number of overhead volleyball swings that occur during practice and compared it to games volumes to provide typical values during both events. Participants: 14 women Division I collegiate volleyball athletes (Age= 20±1, Height=1.8±7.6m, Mass = 74.6±10.0kg). All volunteers read and signed approved consent forms prior to data collection. Interventions: Athletes participated in normal practices and games. Overhead swings were counted by visual observation and divided into serves and attacks for all athletes. Recordings from a standard video camera were used when a researcher could not attend practice. Outcome Measures: Total swings equaled the number of attacks plus the number of serves; this was the dependent measure. The independent measure was event (game or practice). Data were analyzed with an independent Mann-Whitney non-parametric tests with significance set at $P \leq 0.05$. Results: 473 practice and 168 game exposures were recorded. Total swings during practice (49±35) was greater than during games (35±24, $P < 0.001$). Conclusions: The data suggests that significantly more swings occur during practices compared to games which may place an athlete at risk for injury depending on their position and role on the team. Continuing this research should include comparing swing volume between positions.

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Primary Presenter / email: Wolfe, H.W. / heather.wolfe@uky.edu
Student MS
Division of Athletic Training

Mentor / e-mail: Uhl, T.L / tim.uhl@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#187 Abstract Title: Vocal Function Exercises (VFEs) for normal voice: The effects of varying dosage

Author(s):
M. Bane, Div of Communication Sciences and Disorders, U of Kentucky
V. Angadi, Rehabilitation sciences doctoral program, U of Kentucky
R. Andreatta. Div of Communication Sciences and Disorders, U of Kentucky
G. Capilouto, Div of Communication Sciences and Disorders, U of Kentucky
J. Stemple, Div of Communication Sciences and Disorders, U of Kentucky

Abstract: Many phase I trials demonstrate positive treatment effects for various interventions in speech-language pathology. However, most treatments currently employed have little to no information from phase II trials providing guidance on dose-response relationships. This issue is especially salient in the area of voice therapy, where dosing can mean the difference between no effect, the ideal effect, and toxic or adverse effects on voice production. One voice therapy program, Vocal Function Exercises (VFEs), is designed to strengthen and balance the laryngeal musculature and improve the relationship among the three subsystems of voice production: respiration, phonation, and resonance. Coordination of these three subsystems results in efficient vocal fold vibration, which is determined by maximum phonation time. While a variety of studies have demonstrated VFEs to be effective in enhancing both normal and pathological voices, little is known about the ideal dose, or the dose that yields the greatest benefit without causing harm. Establishing the ideal dosage has implications for increasing efficiency of intervention, thereby sparing client and clinician resources, including time, costs, and effort. The purpose of the proposed study is to investigate the effects of varying doses of Vocal Function Exercises on attainment of pre-established maximum phonation time goals in individuals with normal voice production.

Supported by: N/A

Primary Presenter / email: Bane, M / maria.bane@uky.edu
Student MS
Division of Communication Sciences & Disorders

Mentor / e-mail: Stemple, J. C. / jcstem2@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#188 Abstract Title:	**Parent/Caregiver Knowledge and Satisfaction of Information and Referrals related to Speech-Language Pathology Services for Children with Down syndrome.**
Author(s):	E. K. Salmons, Dept of Rehabilitation Sciences, Communication Sciences and Disorders, U of Kentucky S. J. Haynes, Dept of Rehabilitation Sciences, Communication Sciences and Disorders, U of Kentucky

Abstract: Down syndrome, or Trisomy 21, is the most commonly occurring chromosomal abnormality present at birth. The Centers for Disease Control and Prevention estimates that there are approximately 6,000 diagnoses of Down syndrome per year in the United States, further indicating that 1/700 infants are born with Down syndrome. A diagnosis of Down syndrome can be made either prenatally or postnatally. Early intervention services will be warranted to address underlying deficits associated with the syndrome. Communicative disorders are among the most prominent concomitant deficits associated with Down syndrome. Therefore, it is critical that parents/caregivers of children with Down syndrome be provided with information and referrals specifically related speech-language pathology services in a timely manner. Purpose: The purpose of this survey research study was to investigate and assess the overall satisfaction of information and referrals received by parents/caregivers of children with Down syndrome specifically related to speech-language pathology services. Five Down syndrome associations within the state of Kentucky and the Down Syndrome Association of Greater Cincinnati, located in Cincinnati, Ohio were recruited for the dissemination of the participant recruitment materials and survey, both electronically and in hard-copy form. Results: Preliminary results indicate that satisfaction of the information and referrals received by parents/caregivers of children with Down syndrome, specific to speech-language pathology services is fair to low. Findings indicate that professionals, particularly those within the field of speech-language pathology, must continually analyze and asses the delivery and quality of information and referrals provided to the parents/caregivers of children with Down syndrome.

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Primary Presenter / email: Salmons, E. K. / eksalm2@uky.edu
Student MS
Division of Communication Sciences & Disorders

Mentor / e-mail: Kleinert, J. K. / jklei2@ky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#189 Abstract Title: Well-being and Coping Strategies of Military Veterans Readjusting into Academia

Author(s): B. T. Gregg, Dept of Rehabilitation Sciences, U of Kentucky
P. Kitzman, Dept of Rehabilitation Sciences, U of Kentucky
A. Shordike, Occupational Therapy Dept, Eastern Kentucky University

Abstract: Introduction: Previous qualitative studies have identified financial, administrative, and psychological experiences as challenges for Student Veterans transitioning to postsecondary education following combat military service. In response to the limited representation of empirical studies on Student Veterans' transition coping responses, a pilot study was performed at a large land grant research university to survey anonymous voluntary responses from approximately 100 Student Veterans with military deployment experience. Methods: Student Veterans provided anonymous responses to a 40-question online survey on perceived attitudes and behaviors of transitioning from the military to postsecondary education. A Tailored Survey Design using Schlossberg's Model of Adult Transitioning was piloted to collect data on perceived transition concerns, and reported coping styles of adjustment utilized by Student Veterans transitioning to post-secondary education. Results: The pilot study reports a response rate of 13% with (n=13) completed surveys. Significant findings reported in descriptive statistics included: 38% report difficulty managing finances, 45% report the transition abnormal compared to peers, 62% report difficulty with achieving restful sleep, 62% do not seek supports provided by the university and 62% do not utilize the local Veteran Resource Findings. Respondents endorsed the use of autonomous coping strategies as the primary factor for managing their transition to post-secondary education. Discussion: Findings suggest Student Veterans utilize previous military experiences and individual coping strategies more than university resources to manage stressful situations experienced in the university context. Universities should focus efforts on facilitating the use of local support services and resources to maximize a seamless transition process for Student Veterans.

Supported by: N/A

Primary Presenter / email: Gregg, B.T. / brian.t.gregg@uky.edu
Student PhD
Department of Rehabilitation Sciences

Mentor / e-mail: Kitzman, P. / phkitz1@uky.edu

College of Health Sciences Research Day
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#190 Abstract Title: Vocal Function Exercises for the Treatment of Presbyphonia

Author(s): J. Sloggy, Dept of Rehabilitation Sciences, Div of Communication Sciences and Disorders, U of Kentucky
J. Stemple, Dept of Rehabilitation Sciences, Div of Communication Sciences and Disorders, U of Kentucky

Abstract: Voice changes in the elderly (presbyphonia) are common with aging of the subsystems of voice production, respiration, phonation, and resonance. This deterioration of voice is recognized as a part of the normal aging process but may significantly affect quality of life. Vocal Function Exercises (VFEs) comprise a series of exercises designed to strengthen and balance the laryngeal muscles, thus improving vocal fold vibration and voice quality. Several studies have focused on the efficacy of VFEs as a treatment modality for presbyphonia, however these studies are limited by lack of an experimental control and limited outcome measures. The purpose of this proposed study is to further examine the efficacy of VFEs for the treatment of presbyphonia. This study will be the first to use a randomized, placebo-controlled design while comparing pre and post-treatment measures involving all five domains of voice assessment (audio-perceptual, acoustic, aerodynamic, self-assessment, visual imaging). Participants identified through a previous study as having presbyphonia will be recruited and randomly assigned to a treatment or control group. The treatment group will receive six weeks of VFEs and the control group will receive six weeks of placebo therapy with both pre and post-treatment voice assessments. It is hypothesized that the experimental group will show significant improvement in all five domains of voice assessment post-treatment while there will be no significant difference in the pre and post-treatment measures for the control group.

Supported by: NA

Primary Presenter / email: Sloggy, J. / joanna.sloggy@uky.edu
Student PhD
Division of Communication Sciences & Disorders

Mentor / e-mail: Stemple, J. / joseph.stemple@uky.edu

College of Health Sciences Research Day
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#191 Abstract Title:	**Characterizing the distribution of head and neck cancers (HNC) at the University of Kentucky Otolaryngology clinic**
Author(s):	V. Angadi, Div of Communication Sciences and Disorders, U of Kentucky B. Huang, Div of Cancer Biostatistics, U of Kentucky B. Shelton, Div of Cancer Biostatistics, U of Kentucky J. C. Stemple, Div of Communication Sciences and Disorders, U of Kentucky

Abstract: Background: At 13.5%, Kentucky has the 6th highest incidence of head and neck cancers in U.S and this rate continues to rise. This can be attributed to the high consumption of tobacco in the state. Within Kentucky, Appalachian Kentucky shows a higher incidence across all cancers, including HNC. Health disparities within Appalachian Kentucky have been a constant source of concern to healthcare providers.

Objective: To characterize the distribution of specific trends of HNC in the treatment seeking population at the University of Kentucky otolaryngology clinic during a three year period. Methods: Data for specific factors was obtained from the Kentucky Cancer Registry. This included information related to age, sex, site of lesion, histology type, disease stage, treatment, tobacco use and county wise distribution.

Results: Higher number of males as compared to females was diagnosed with HNC. The mean age at the time of diagnosis was 58 years. Larynx was the most common disease site. The total number of people diagnosed with HNC was significantly higher in Appalachian Kentucky as compared to non- Appalachian Kentucky. Conclusions: The present analyses show that the population of Appalachian Kentucky is at higher risk for HNC. It is well known that the Appalachian population does not have access to basic healthcare facilities due to socioeconomic disparities. This is possibly why more people were diagnosed with advanced stage disease. Advanced disease stage increases mortality and disease and treatment related morbidity. Once identified, there is a need to implement outreach and screening programs for high risk regions.

Supported by: N/A

Primary Presenter / email: Angadi, V / vsan222@uky.edu
Student PhD
Rehabilitation Sciences Doctoral Program

Mentor / e-mail: Shelton, B / brent.shelton@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#192 Abstract Title: Caregiver Perception of Change in the Social Network after Stroke

Author(s): S. Campbell, Dept of Rehabilitation Sciences, U of Kentucky
H. Gatlin, Dept of Rehabilitation Sciences, U of Kentucky

Abstract: Having a stroke can have a negative impact on the social interaction and activity/participation levels of a person (Hosking, Marsh et al. 1996; Hinckley 1998; Cruice, Worrall et al. 2006; Haun, Rittman et al. 2008). Less time is spent in social situations and patients may report more dissatisfaction with their social network after the stroke. There is limited study of the change from pre- to post-stroke social network, including variables that are potential key factors in this change. The purpose of the research project was to primarily answer the following questions: 1) How does the social network change after a person has a stroke, as perceived by the person's caregiver? The primary caregiver for each individual with stroke (IWS) completed a survey both at the onset of the stroke and 3 months after stroke. Pre- to post-stroke changes related to the social network and social activities for the IWS were analyzed. Few significant changes in the social network were observed pre- to post-stroke, except that the number of acquaintances decreased after the stroke. Communication impairments did not impact social networks, while mobility impairments had some impact on certain aspects of the social network and social activities post stroke. Other trends in the raw data were noted at each level of the social network. Limitation s of the study will also be provided.

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Primary Presenter / email: Campbell, S. / scamp3@uky.edu
Student PhD
Rehabilitation Sciences Doctoral Program

Mentor / e-mail: Campbell, S. / scamp3@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#193 Abstract Title:	The Lived Experience of Preparing for Discharge Home After Total Knee Replacement

Author(s): K. R. Causey-Upton, Dept of Occupational Science and Occupational Therapy, EKU *I am also a student in the PhD in Rehabilitation Sciences program at UK

Abstract: Quantitative outcomes following total knee replacement (TKR) have been studied extensively, however information about the subjective experience of preparing for discharge home after TKR is limited in the current research literature. The purpose of this transcendental phenomenological study is to describe patients' experiences of preparing for discharge home following elective TKR and to gain an understanding of what factors impact subjective readiness for return to home following TKR surgery. Purposive sampling was used to identify participants who had recently experienced the phenomenon under study: elective TKR surgery and the process of preparing for discharge home from the acute care setting. Data was collected using in-depth, semi-structured interviews lasting approximately 30-45 minutes; interviews were recorded and transcribed verbatim. Data analysis and data collection were concurrent, permitting subsequent interviews to be altered as needed based on results from previous participants. Thematic analysis of the interview transcriptions was conducted to identify significant meaning statements through a process of horizontalization. Significant statements were then organized into shared themes among participants regarding the essence of the experience of preparing for discharge and factors that impact subjective readiness for discharge. Initial themes that emerged from data analysis include: feeling safe, being supported, confidence, maintaining independence, preparing for the postoperative phase, and persevering. At the time of this abstract submission, interviews have been conducted and analyzed for 4 participants. Participant recruitment is still ongoing to achieve data saturation. This research study was approved by a University IRB as well as Scientific Review Committee at the study setting.

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Primary Presenter / email: Causey-Upton, K. R. / renee.causey-upton@eku.edu
Student PhD
Rehabilitation Sciences Doctoral Program

Mentor / e-mail: Causey-Upton, K. R. / renee.causey-upton@eku.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#194 Abstract Title:	**Vocalization Subsystem Responses to Temporarily Induced Unilateral Vocal Fold Paralysis**
Author(s):	D. J. Croake, Dept of Rehabilitation Sciences, U of Kentucky J. C. Stemple, Dept of Rehabilitation Sciences, U of Kentucky R. D. Andreatta, Dept of Rehabilitation Sciences, U of Kentucky

Abstract: The voice physiology literature is replete with anecdotal suggestions that healthy voicing is dependent on a dynamic balance of three interactive subsystems: respiration, phonation, and resonance. Theoretically, multiple patterns of subsystem interactions likely underlie healthy voice production. However, surprisingly little quantitative data exists defining the nature of these subsystem production patterns and interactions. Understanding the tradeoffs in subsystem interactions is deemed fundamental for development of physiologic models of voice production and the development of improved treatment strategies. We hypothesize that the nature of characteristic symptoms of disordered voice production stems from subsystem alterations that destabilize and disturb the balance of normal patterns of subsystem behavior. The central aim of this study is thus to quantify the interactions of the vocalization subsystems in a non-perturbed and perturbed condition (induced unilateral vocal fold paralysis) in 20 vocally healthy participants. Respiratory inductance plethysmography, laryngeal aerodynamics, and acoustic formant data will be used to measure the proportional contributions of and changes to the three vocal subsystems during voice production tasks under both perturbed and non-perturbed conditions. The overall hypothesis is that individuals will demonstrate distinctive patterns of change in voice subsystem interaction, resulting in characteristic vocalization profiles for the non-perturbed and perturbed production states. This study will lay the groundwork for a physiologic model of voice production that will be used to develop a diagnostic profiling method to more accurately assess functional aspects of voice disorders. Such a method is envisioned to drive and better tailor treatment strategies to a patient's specific needs.

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Primary Presenter / email: Croake, D.J. / djcroa2@uky.edu
Student PhD
Rehabilitation Sciences Doctoral Program

Mentor / e-mail: Stemple, J. C. / joseph.stemple@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#195 Abstract Title: **Strategies Available for Youth with Intellectual and Developmental Disabilities in the Clinical Transition from Pediatric to Adult Oriented Therapy Systems: A Survey of Pediatric Therapists**

Author(s): C.L. Gohrband, Physical Therapy, U of Kentucky

Abstract: Purpose: The purpose of this pilot study was to investigate strategies used by pediatric physical and occupational therapists to advocate for therapy services for their students as they transition from pediatric to adult therapy. This study also looked to identify what resources were used in clinical transition. Number of Subjects: Forty-two school-based therapists participated. Procedures: A study was distributed to Dayton, Ohio area school-based therapists to determine the clinical transition strategies used and resources available to meet the needs of their students. Statistical Analysis: Respondents identified that 60% had students in need of clinical transitions; 32% had been requested to provide input for clinical transitions; 57% did not know their role in the transition process; and 67% indicated they were not equipped to provide input for clinical transitions. Additionally, 52% of respondents reported they were not aware of resources for clinical transitions and 86% reported they were interested in learning more about the clinical transitions. Results: The results of this survey showed a general awareness of clinical transitions, however, there were still many unknowns about this process and available resources. This study showed similar results to a 2011 regional study that suggest that PT's may benefit from further education and resources to assist their students with clinical transitions. Important Findings (conclusions): Respondents appear interested in learning more about clinical transition resources and guidelines. Further research should survey therapists across a wider geographical area in varied practice settings to more thoroughly examine the resources that do exist, and to explore the experiences that therapists have with the transition process.

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Primary Presenter / email: Gohrband, C. L. / clgo223@uky.edu
Student PhD
Rehabilitation Sciences Doctoral Program

Mentor / e-mail: Effgen, S.K. / susan.effgen1@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#196 Abstract Title: Understanding the Experience of Driving with a Passenger with Aphasia

Author(s):
R. S. Husak, Dept of Rehabilitation Sciences
R. C. Marshall, Depts of Communication Sciences and Disorders and Rehabilitation Sciences
G. D. Rowles, Dept of Gerontology
K. A. Kirkham, Dept of Communication Sciences and Disorders
A. A. Wagner, Dept of Communication Sciences and Disorders

Abstract: Under most circumstances, adult passengers provide minimal distraction when conversing with their drivers. One possible exception arises when a person with aphasia is a passenger in an automobile driven by a person without aphasia. This study aimed to describe the experience of driving with a passenger with aphasia. Nine adults, who regularly serve as the primary driver of a person with aphasia, were interviewed. Data were analyzed using thematic analysis. Four themes emerged: communicating, helping, adapting, and overreacting. Implications revealed that additional clinical research on this topic is needed and that clinicians are in a unique position to enhance the in-vehicle experiences of people with aphasia and their spouses.

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Primary Presenter / email: Husak, R. S. / ryan.husak@gmail.com
Student PhD
Rehabilitation Sciences Doctoral Program

Mentor / e-mail: Marshall, R. C. / rcmarsh@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#197 Abstract Title:	**Impaired Quadriceps Rate of Torque Development and Knee Mechanics After Anterior Cruciate Ligament Reconstruction**
Author(s):	P.W. Kline, Div of Physical Therapy, College of Health Sciences, U of Kentucky K.D. Morgan, Div of Physical Therapy, College of Health Sciences, U of Kentucky D.L. Johnson, Dept of Orthopaedic Surgery & Sports Medicine, U of Kentucky M.L. Ireland, Dept of Orthopaedic Surgery & Sports Medicine, U of Kentucky B. Noehren, Div of Physical Therapy, College of Health Sciences, U of Kentucky

Abstract: Purpose: The purpose of this study was to determine if there are reductions in the rate of torque development (RTD) of the quadriceps, the rate (RKEM) and timing of knee extensor moment (KEM) development, and the associations of RTD to RKEM and knee flexion excursion (KFLEX) during running following an ACL reconstruction (ACLR). Methods: Twenty-six subjects 6-months post-ACLR were included (13 females, 20.4±6 years, 72.9±12.5 kg, 1.7±0.1 m). Subjects performed four, 5-second maximal voluntary isometric strength trials of both limbs on a dynamometer to determine the RTD for each limb. Then, subjects underwent 3-D motion analysis while running on an instrumented treadmill at a self-selected speed (mean 2.74 ± 0.2 m/s). Joint angles and internal moments were calculated from the stance phase to determine RKEM and KFLEX. Paired t-tests were used for between limb comparisons of all dependent variables. Pearson's correlations were used to assess the associations of RTD, RKEM, and KFLEX. Results: Significant deficits in RTD and RKEM were present (RTD 262.51 vs. 582.62 Nm/s, $p<0.01$; RKEM 16.12 vs. 21.89 Nm/kg*m*s, $p<0.01$) in the reconstructed limb. The reconstructed limb also demonstrated delayed onset of KEM (11.34 vs. 9.57 % stance, $p<0.01$) and less knee flexion excursion (15.5 vs. 19.99 degs, $p<0.01$) than the non-reconstructed limb. RKEM was significantly correlated with KFLEX ($r=.411$, $p=0.037$). Conclusions: Following ACLR, patients have lower RTD, RKEM, and delayed timing of KEM in the reconstructed limb. Diminished capacity to generate torque reduces the quadriceps' ability to attenuate large impact forces that occur early in stance.

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Primary Presenter / email: Kline, P.W. / pwkl222@g.uky.edu
Student PhD
Rehabilitation Sciences Doctoral Program

Mentor / e-mail: Noehren, B. / b.noehren@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#198 Abstract Title:	The Influence of Physical Characteristics and Self-Reported History on Functional Performance Tests

Author(s):
K. Kosik, Dept of Rehabilitation Science, U of Kentucky
M. Terada, Dept of Rehabilitation Science, U of Kentucky
A. Lepley, Dept of Kinesiology and Health Promotion, U of Kentucky
R. McCann, Dept of Rehabilitation Science, U of Kentucky
B. Pietrosimone, Dept of Exercise and Sport Science, U of North Carolina
A. Thomas, Dept of Kinesiology, U of North Carolina Charlotte
P. Gribble, Dept of Rehabilitation Science, U of Kentucky

Abstract: Context: In order to develop a comprehensive and successful musculoskeletal screening tool, it is important to understand the influence of physical characteristics on functional performance. Objective: Examine the association of previous injury history; level of competition, age and BMI has on SEBT and FMS performance. Design: Cross-sectional descriptive study. Setting: Athletic Training facility. Patients or Other Participants: Seven hundred forty-eight football players from DI NCAA (n=331, 19.85±1.38years, 186.52±7.02cm, 103.29±19.08kg) and HS (n=417, 15.80±1.14years, 177.11±8.41cm, 80±17.25kg) teams volunteered. Interventions: Three reach directions of the SEBT and the Modified FMS. Main Outcome Measures: Scores for the SEBT-A, SEBT-PM and SEBT-PL were averaged and normalized to stance leg length(%). A composite score was calculated from the mean of the normalized reach directions(%). A modified FMS score (FMS-M) was calculated by taking the sum of the performance of the four selected movements (#/12). BMI was calculated from the height(m) and mass(kg) for each participant. Previous history of ankle or knee injuries was self-reported. Mann-Whitney U tests were used to assess differences between each categorical variable, while spearman correlations were run between continuous variables for each outcome variable. Results: Compared to DI players, HS athletes scored higher on the SEBT-PM (HS:88.5±11.5%,DI:84.2±9.8%;P<0.001), but lower on the SEBT-PL(HS:72.64±11.2%,collegiate:78.5±11.2%;P<0.001), and SEBT composite score(HS:75.6±8.4%,DI:79.2±8.1%; P<0.001). HS players scored lower on the FMS-M(6.8±1.6) versus DI players(9.6±1.6; P<0.001). Age was weakly correlated with SEBT-PM(ρ=0.224;P<0.001), SEBT-PL(ρ=0.223; P<0.001) and the SEBT composite score(ρ=0.213; P<0.001). Age was moderately correlated with FMS-M(ρ=0.551;P<0.001). BMI was weakly correlated with SEBT-A(P<0.001,ρ= -0.276) and FMS-M(P<0.001,ρ=0.194) scores. Performance on the functional tests did not differ between participants with or without ankle or knee injury history (P>0.05). Conclusions: Level and age should be considered when assessing SEBT and FMS outcomes. This has important implications for developing successful prediction models for lower extremity injury risk in football players.

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Primary Presenter / email: Kosik, K. / kyle.kosik@uky.edu
Student PhD
Rehabilitation Sciences Doctoral Program

Mentor / e-mail: Gribble, P. / phillip.gribble@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#199 Abstract Title:	The Relationship Between Selective Attention and Global Coherence Following Right Hemisphere Stroke: A Proposed Study

Author(s): J. Kadle, Dept of Rehabilitation Sciences, Div of Communication Sciences & Disorders, U of Kentucky
S. Wade, Dept of Rehabilitation Sciences, Div of Communication Sciences & Disorders, U of Kentucky
K. Maddy, Dept of Rehabilitation Sciences, Div of Communication Sciences & Disorders, U of Kentucky
G. Capilouto, Dept of Rehabilitation Sciences, Div of Communication Sciences & Disorders, U of Kentucky

Abstract: Global Coherence is the ability to maintain an overall topic during a conversation or narrative. Studies examining global coherence following right hemisphere stroke have also shown global coherence deficits and researchers have proposed that this occurs due to impairments in selective attention (Glosser & Deser, 1990; Wills, Capilouto, & Wright, 2012). However, few researchers have systematically examined this relationship. Therefore, the goal of the proposed study is to determine if there is a relationship between selective attention and global coherence following right hemisphere stroke. In order to produce a significant difference, 20 participants from the University of Kentucky Chandler Medical Center and Cardinal Hill Rehabilitation Hospital will be recruited. Inclusion criteria includes: 1) between the ages of 40 and 89; 2) right hemisphere stroke at least two weeks prior to participation; 3) vision and hearing WFL, aided or unaided; 4) no neurodegenerative disease or previous brain injury; 4) right handed; and 5) native English speakers. Participants will complete the following discourse tasks: recounts, picture description, and stories in an isolation condition and a distraction condition. The influence of selective attention will be analyzed by comparing global coherence scores between the two conditions. To assess the process of inhibition specifically, the relationship between inhibition, as measured by the Stroop, and global coherence will be analyzed. It is predicted that there will be a significant relationship between global coherence scores and selective attention abilities, higher Stroop scores will be associated with higher global coherence scores. Findings from this study have the potential to enhance the clinical practice of speech-language pathologists evaluating and treating individuals with global coherence deficits following right hemisphere stroke.

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Primary Presenter / email: Maddy, K. M. / klmc227@uky.edu
Student PhD
Rehabilitation Sciences Doctoral Program

Mentor / e-mail: Capilouto, G. J. / gjcapi2@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#200 Abstract Title: **Aerobic and Strengthening Interventions for Patients with Orofacial Pain: A Systematic Review**

Author(s): G. S. Naze, Dept of Rehabilitation Sciences, Orofacial Pain Center, U of Kentucky
A. L. Harrison, Dept of Rehabilitation Sciences, Orofacial Pain Center, U of Kentucky

Abstract: Background: Aerobic and muscular strengthening exercise interventions have been utilized to improve pain and function in patients with chronic pain disorders such as fibromyalgia and low back pain. However, the role of exercise in the treatment of patients with orofacial pain (OFP) has not been well researched. This population includes patients with temporomandibular disorders (TMD), primary headache, and cervicogenic headache. Objectives: To systematically review the evidence for the effect of aerobic or strengthening exercises on pain intensity, pain frequency, and function in patients with OFP. Method: A systematic search of the peer reviewed literature using specific search terms was performed to identify studies that included a clinical trial of a cohort of subjects using aerobic or strengthening exercises to improve pain and/or function in patients with OFP. An article was eligible for inclusion if it met all of the following criteria: (1) a strengthening or aerobic exercise intervention was used (2) the experimental design was a controlled clinical trial, (3) outcomes in pain intensity, frequency, and/or function were reported (4) articles were written in the English language. An article was excluded if: (1) only active range of motion (AROM), relaxation, and/or postural education exercises were used in the study. Articles were scored using the Downs and Black scale for studies of health care interventions. The PRISMA guidelines for conducting a systematic review were used to conduct the review. Results: A total of 1810 articles were identified through database searching. The included 25 studies were of varying populations, quality, and designs. These studies support the use of either aerobic and/or strengthening exercise to improve pain and/or function in patients with migraine headache (7), tension-type headache (6), cervicogenic headache (4), general headache (7), and myogenic TMD (1). Conclusion: While support for aerobic and strengthening exercise therapy was found for improving pain and function in patients with OFP, few studies compared doses or modes of exercise. Further high quality cohort studies are needed to optimize exercise prescription for patients with OFP.
Key Words: orofacial pain; migraine; tension-type; cervicogenic; headache; exercise; exercise therapy

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Primary Presenter / email: Naze, G. S. / garrett.naze@uky.edu
Student PhD
Rehabilitation Sciences Doctoral Program

Mentor / e-mail: Harrison, A. L. / anne.harrison@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#201 Abstract Title:	'It doesn't require much effort once you get to know them': Certified Nursing Assistants' Views of Communication in Long-term Care
Author(s):	C. Page, Dept of Rehabilitation Sciences, U of Kentucky G. Rowles, Dept of Gerontology, U of Kentucky

Abstract: Background: In the United States, a large proportion of residents in long-term facilities have cognitive-communication impairments. Certified nursing assistants (CNAs) provide the majority of hands-on care for residents and become highly sensitive to their communication behaviors. Yet, CNAs feel overlooked when communicating residents' medical needs to higher levels of authority. This decreases job satisfaction, reinforces high turnover rates and reduces residents' quality of care and life. Aims: The aim of this study was to give CNAs a voice by describing the communication environment in long-term care in relation to residents with communication impairments. Methods & Procedures: The study's design was qualitative using focus group interviews. 23 CNAs were asked how they communicate with residents, strategies employed to facilitate communication, and suggestions to improve resident-staff communication. The final question related to communication plans. Outcomes & Results: Overall findings suggest that the communication environment in long-term care can be best understood in relation to three overlapping constructs: (1) CNA and resident communication; (2) the paradox of context; (3) dedication to residents. CNAs frequently interact with residents creating familiarity with residents' communication behaviors. However, a division between "top and bottom staff" created challenges in relaying residents' communication intentions and providing quality care. Lastly, CNAs' are dedicated to residents and desire enhanced interdisciplinary communication to ensure optimal care. Therefore, CNA participants propose that quality of care in LTC is grounded in communication. Conclusions: In conclusion, there is a paradox in long-term care facilities. CNAs understand the residents' communication behaviors better than most health care providers; yet, time to communicate with residents is limited, and CNAs feel debased when expressing resident concerns to higher levels of nursing authority. This study strongly suggested that communication plans may improve the communication environment in long-term care.

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Primary Presenter / email: Page, C.G / christen.page@uky.edu
Student PhD
Rehabilitation Sciences Doctoral Program

Mentor / e-mail: Rowles, G. / growl2@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#202 Abstract Title:	**Minimal Clinical Important Difference of the Quick Disabilities of the Arm Shoulder and Hand (QuickDASH) for Non-surgical Lateral Epicondylitis**
Author(s):	E. V. Smith-Forbes, Dept of Rehabilitation Sciences, U of Kentucky D. M. Howell, Dept of Rehabilitation Sciences, U of Kentucky, Eastern Kentucky U J. Willoughby, Kentucky Hand & Physical Therapy/ Drayer Physical Therapy Institute, Lexington, KY G. D. Pitts, Kentucky Hand & Physical Therapy/ Drayer Physical Therapy Institute, Lexington, KY T. L. Uhl, Kentucky Hand & Physical Therapy/ Drayer Physical Therapy Institute, Lexington, KY

Abstract: Study design: Retrospective. Purpose: To determine the minimal clinically important difference (MCID) for the Quick Disabilities of the Arm, Shoulder and Hand (QuickDASH) outcome measure, for non-surgical lateral epicondylitis diagnosis, using a triangulation of distribution-and anchor-based approaches. Background: The MCID for the QuickDASH has been established using a pool of multiple conditions, and specifically for the shoulder, but not for specific diagnosis conditions such as lateral epicondilytis. Methods: The QuickDASH scores were obtained from a database for 137 participants with non-surgical lateral epicondylitis (mean ± SD age, 46 ± 9 years; 71 women) before and after a hand therapy program. The external anchor was a 15-point global rating of change scale. Scores were obtained for 12 visits (mean ± SD length of treatment, 39 ± 11 days). Results: The test-retest reliability of the QuickDASH was moderate (intraclass correlation coefficient model 2,1 = 0.69). The minimum detectable change at the 90% confidence level was 22.5 points for the QuickDASH. The receiver operating characteristics curve (ROC) that best identified QuickDASH cutoff values was 15.8 points. The mean change of those minimally improved using a Global Rate of Change anchor of (+1 to +3) was 15.3 points. The area under the curve for the ROC was 0.64. Following triangulation rules, a QuickDASH MCID of 15.8 points from the ROC was selected since it was closer to the MDC90 margin of error. Conclusion: The QuickDASH MCID = 16 points could represent the minimal change in score important to a non-surgical lateral epicondylitis patent.

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Primary Presenter / email: Smith-Forbes, E. V. / enrique.smith-forbes@uky.edu
Student PhD
Rehabilitation Sciences Doctoral Program

Mentor / e-mail: Uhl, T. L. / tim.uhl@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#203 Abstract Title: Efficacy of Vocal Function Exercises following irradiation for early glottic cancers

Author(s): V. Angadi, Rehabilitation Sciences, U of Kentucky
M. Brown, Communication Sciences and Disorders, U of Kentucky
J.C. Stemple, Communication Sciences and Disorders, U of Kentucky

Abstract: Background: Although radiation therapy (RT) is a curative treatment for larynx cancer, the collateral damage to laryngeal structures causes long term voice deficits. Vocal hygiene counseling is standard of care for patients who have undergone RT. However, previous studies indicate that vocal hygiene paired with Vocal Function Exercises (VFES) can improve vocal fold vibratory characteristics, and balance respiration, phonation, and resonance. Through this study we propose to compare voice outcomes following two different voice treatment methods; vocal hygiene alone and VFEs. The present study is preliminary data which is part of a larger Phase 2 clinical trial. Methods: Study design: Case series. Two subjects were randomized to the control and exercise group. The subject in the control group received vocal hygiene and the subject in the exercise group received VFEs and vocal hygiene. Both subjects had been irradiated for early glottic cancers and had been disease free for a minimum of 6 months. Voice outcomes were measured using the five domains of voice assessment, patient self-assessment, perceptual assessment, acoustic, aerodynamic, and stroboscopic and high speed laryngeal imaging. Data was collected pre and post-treatment. Results: The subject in the exercise group showed a greater improvement in all five domains of voice assessment as compared to the subject in the control group. Discussion: VFEs were more effective in improving overall voice quality. Since VFEs have never been used in this population, it would be interesting to investigate their overall efficacy in improving voice quality for this group of patients.

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Primary Presenter / email: Brown, M / megan.brown22@uky.edu
Student Undergrad
Communication Sciences and Disorders - Division of Communication Sciences & Disorders

Mentor / e-mail: Stemple, J.C. / jcstem2@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#204 Abstract Title: The Effects of Morphine on the Blood Brain Barrier: an in vitro study

Author(s): B. Aboagye, College of Health Sciences, U of Kentucky
M. Nonnemacher, Dept of Microbiology and Immunology, Drexel University
B. Wigdahl, Dept of Microbiology and Immunology, Drexel University

Abstract: Morphine abuse by human immunodeficiency virus type 1 (HIV-1)-infected individuals leads to an increase in viral replication and peripheral viral load, rapid disease progression and increased incidence and severity of neurocognitive abnormalities compared to non-drug abusers. The blood-brain barrier (BBB) is an obstacle that must be overcome during neuroinvasion with eventual development of HIV-associated neurocognitive disorders (HAND). Previous studies of mu-opioids and alteration of BBB permeability have suggested that exposure increases cellular transmigration through an uncharacterized mechanism. In this study, a human brain microvascular endothelial cell (hBMEC) line, hCMEC/D3, was used to establish an in vitro transwell model of the BBB to investigate the effects of chronic (24, 48, 72 hour) morphine treatment on barrier structure and function. The FITC-dextran permeability assay was used to determine the confluence of the cells, the transmigration assay to test the migratory response of the endothelial cells and western blot to test for alteration in tight junction protein expression in the membrane fraction of the cells. We observed that prolonged morphine exposure does not alter the rate of FITC-dextran passage and also peripheral blood mononuclear cell (PBMC) transmigration is increased across the hCMEC/D3 monolayer following 72 h morphine exposure. Functionally, an increase in PBMC transmigration and firm adhesion was observed following prolonged morphine exposure, in the absence of an increase in overall barrier leakiness. The results suggested that morphine activates hCMEC/D3 cells leading to a cell environment permissive to transmigration. These studies may uncover a mechanism by which morphine disrupts periphery-CNS homeostasis leading to accelerated HAND.

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Primary Presenter / email: Aboagye, B. / bill.aboagye@live.com
Student Undergrad
Human Health Sciences - Division of Human Health Sciences

Mentor / e-mail: Capilouto, G. / gilson.capilouto@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#205 Abstract Title: The Relationship of Aging and Vocal Decline

Author(s):
E. J. Winrich, Dept of Rehabilitation Sciences, U of Kentucky
C. A. Mc Mullen, Dept of Physiology, U of Kentucky
R. D. Andreatta, Dept of Rehabilitation Sciences, U of Kentucky
V. Angadi, Dept of Rehabilitation Sciences, U of Kentucky
T. L. Uhl, Dept of Rehabilitation Sciences, U of Kentucky
M. Dietrich, Dept of Communication Science and Disorders, U of Missouri
J.C. Stemple, Dept of Rehabilitation Sciences, U of Kentucky

Abstract: Objective: To establish health-related and biological indicators related to vocal decline in a non-treatment seeking elderly population. Methods/Design: Fifty-one local volunteers between the ages of 60-85 years were assigned to one of two groups based on the presence or absence of vocal fold atrophy and bowing consistent with presbylaryngeus and vocal quality consistent with presbyphonia. Group assignment was made by two certified speech-language pathologists with expertise in voice. All subjects were evaluated on outcome measures of select aging health-related and biological indicators as well as traditional vocal function assessments. Health-related and biological indicators under investigation included: anthropometric measures, inflammatory markers, physical strength measures, gait and balance ability, respiratory function, and physical activity level. Vocal function was assessed with selected measures from the five domains of vocal assessment: visuo-perceptual, aerodynamic, acoustic, auditory-perceptual, and self-reported voice-related quality of life. Results: A diagnosis of presbylaryngeus was significantly correlated with health-related and biological indicators of body weight, total lean body mass, region percent fat, and Physical Activity Scale for the Elderly (PASE). Vocal measures significantly correlated to these indicators included: auditory-perceptual assessment, noise to harmonics ratio, and cepstral spectral index of dysphonia. Conclusions: Correlations between several study measures and presbylaryngeus were noted. This preliminary data will be used to support a future NIH grant application. The overarching goal of this research is to develop novel screening tools and specific treatments for delaying or rehabilitating vocal decline in the elderly.

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Primary Presenter / email: Winrich, E. / evan.winrich@uky.edu
Student Undergrad
Human Health Sciences - Division of Human Health Sciences

Mentor / e-mail: Stemple, J.C. / joseph.stemple@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#206 Abstract Title:	**Physiological Cross-sectional Area of the Hamstring Muscles: Implications for Injury Mechanisms**
Author(s):	C. Alcorn, Rehabilitation Sciences, U of Kentucky P. Hardy, Dept of Radiology, U of Kentucky A. Anderson, Dept of Anatomy and Neurobiology, U of Kentucky D. Akers, Dept of Statistics, U. of Kentucky B. Damon, Institute of Imaging Science, Vanderbilt University B. Noehren, Rehabilitation Sciences, U of Kentucky

Abstract: Abstract: The hamstrings play an important role in slowing the knee during high velocity movements. However, there remains little in-vivo data on the important morphological features of the hamstrings, such as physiological cross-sectional areas (PCSA). Previous attempts to find PCSA values combined data from different technologies or used estimates of these properties, potentially resulting in inaccurate data. PURPOSE: The purpose of the study is to compare the PCSA of three major hamstring muscles: bicep femoris long head (BFLH), semitendinosus (ST), and semimembranosus (SM). METHODS: Five healthy female subjects (age of 27.4±9.56years) with no history of lower extremity injury. Subjects underwent diffusion tensor magnetic resonance imaging of the right thigh. The data was processed in Slicer3D to calculate muscle volume. Custom MATLAB code was used to calculate muscle fiber tract length and pennation angles, from which PCSA was calculated. A repeated measure ANOVA was used to assess differences and a least squared difference test was used to determine significant difference between variables. RESULTS: Mean PCSA for the BFLH, SM, and ST were 77.87±24.77, 66.26±25.57, and 25.03±7.15mm^2, respectively. The overall statistical model was significant (p=0.0144). Planned comparisons between the BFLH and ST (p=0.0075) and between the SM and ST (p=0.0098) were significant, but not between the BFLH and SM (p=0.2632). CONCLUSIONS: We found that the BFLH had the greatest mean PCSA followed by the SM and ST. The BFLH and SM had significantly larger PCSA values than the ST, suggesting a greater ability to generate force. These results suggest the higher PCSA in the BFLH places greater demands on the muscle potentially contributing to the high injury incidence in this muscle.

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Primary Presenter / email: Alcorn, C. / chris.alcorn@uky.edu
Student Undergrad
Human Nutrition - Division of Physical Therapy

Mentor / e-mail: Noehren, B. / b.noehren@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#207 Abstract Title: Does the Trunk Affect the Knee Abduction Moment During a Run to Cut Task?

Author(s): C. S. Beegan, Rehabilitaion Sciences, U of Kentucky
C. E. Garcia, Rehabilitation Sciences, U of Kentucky
C. Hayes, Orthopedic Surgery, U of Kentucky
M. L. Ireland, Orthopedic Surgery, U of Kentucky
B. W. Noehren, Rehabilitation Sciences, U of Kentucky

Abstract: During cutting, greater ipsilateral lean of the trunk/pelvis contributes to elevated knee abduction moments, which are linked to Anterior Cruciate Ligament tears. However, there have been few investigations assessing relationships of trunk/pelvis lean to knee abduction moment during cutting. PURPOSE: The aim was to assess relationships of peak ipsilateral frontal plane trunk/pelvis angles to the knee abduction moment during cutting. METHODS: In an ongoing study, a cutting task was performed by ten healthy subjects (5 male, 5 female, age of 23 ± 2.8 years). Participants performed a cutting task by planting their right leg and cutting toward the left. Kinematic variables included peak frontal plane trunk angle, pelvis angle, and knee abduction moment. Means, standard deviation, and Pearson Correlation were calculated. A one-tailed test of significance was used due to the preliminary nature. RESULTS: Mean values for trunk angle, pelvis angle, and knee abduction moment were 0.5 ± 4.9°, -8.0 ± 3.0°, -0.7 ± 0.3 Nm/kg, respectively. There was a moderate, but not significant, correlation between trunk angle and knee abduction moment (r= 0.465, p=0.088) and between pelvis angle and knee abduction moment (r=0.474, p=0.083). CONCLUSION: Greater trunk/pelvis angles and knee abduction moments were moderately related, yet not statistically significant; however, with additional participants we expect significance due to an increase in power. The trunk positioning and knee abduction moment relationships indicate greater trunk lean and pelvic tilt over the stance leg increases knee load and possibly injury risk. However, these relationships were moderate suggesting factors such as ground reaction force magnitude may also contribute.

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Primary Presenter / email: Beegan, C. S. / chelsea.beegan1@uky.edu
Student Undergrad
Psychology - Division of Physical Therapy

Mentor / e-mail: Noehren, B. W. / b.noehren@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#208 Abstract Title:	**The Relationship of Plank Performance to Trunk, Pelvis and Knee Mechanics during a Cutting Task**
Author(s):	C. E. Garcia, Rehabilitation Sciences, U of Kentucky C. S. Beegan, Rehabilitation Sciences, U of Kentucky C. Hayes, Orthopedic Surgery, U of Kentucky M.L. Ireland, Orthopedic Surgery, U of Kentucky B. W. Noehren, Rehabilitation Sciences, U of Kentucky

Abstract: Injury prevention and rehabilitation programs emphasize core strength exercises assuming they improve trunk, pelvis and knee control. However, few investigations have tested this relationship. PURPOSE: This study sought to determine if commonly used measures of core stability correlate to knee abduction moment along with peak frontal plane trunk and pelvis angles. METHODS: In an ongoing study, ten healthy subjects (5 males, 5 females, 23± 2.8 years) were recruited. An instrumented cutting task was performed at self-selected speeds. The participant ran straight, planted the right leg and cut 45º left. Kinematic variables included peak knee abduction moment (KAM), trunk frontal plane angle (TFPA) and pelvis frontal plane angle (PFPA). A timed plank and left side plank was completed to fatigue. A one tailed test of significance for the Pearson product correlation was used. RESULTS: Mean values for plank and side plank times were 114.8 ± 44.7s and 68 ± 25s, respectively. The mean values for KAM, TFPA and PFPA were -0.7 ± 0.3 Nm/kg, 0.5 ± 4.9º, and -8 ± 3º, respectively. There was significant correlation between left side plank time and PFPA (r=-.665, p=.02), moderate correlation with TFPA (r=0.33, p=0.17) and no correlation with KAM (r=0.004, p=.49). There was a moderate correlation between plank time and KAM (r=0.40, p=0.12) and no correlation with TFPA (r=0.10, p=0.39) or PFPA (r=-0.85, p=0.41). CONCLUSION: Our main findings were that side plank performance was related significantly to PFPA and moderately to TFPA. Furthermore, plank time had a moderate relationship with KAM. These results suggest return to play decisions for athletes should consider plank and side plank times for the evaluation.

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Primary Presenter / email: Garcia, C. E. / catie.garcia@uky.edu
Student Undergrad
Kinesiology - Division of Physical Therapy

Mentor / e-mail: Noehren, B. W. / b.noehren@uky.edu

College of Health Sciences Research Day
Poster Presentation Abstracts

#209 Abstract Title:	**In-Vivo Determination of Differences in Physiological Cross Sectional Area Among the Vasti Muscles**
Author(s):	F. Omidy, Dept of Rehabilitation Sciences, U of Kentucky P.Hardy, Dept of Radiology, U of Kentucky A. Anders, Dept of Anatomy and Neurobiology, U of Kentucky D. Akers, Dept of Mathematics, U of Kentucky B. Damon, Dept of Molecular Physiology and Biophysics, Vanderbilt University B. Noehren, Dept of Rehabilitation Sciences, U of Kentucky

Abstract: The vasti muscles of the quadriceps are powerful knee extensors, which serve important roles in force attenuation during gait and jumping. An important determining factor of force-generating capacity is the physiological cross-sectional area (PCSA). However, do the challenges of measuring PCSA, little in-vivo data exists for how this varies across the vasti muscles. PURPOSE: The objective of this study assessed the relationship of PCSA between the vastus lateralis (VL), vastus intermedius (VI), and vastus medialis Oblique (VMO). METHODS: Ten subjects (7 female, 3 male, ages 25.2±7.28) without previous injury participated in this study. Anatomical and DT-MRI scans were obtained from the right thigh. The data was post processed using Slicer3D and custom Matlab code to determine volume, fiber length, and pennation angle of each muscle from which PSCA was directly determined. A repeated measure ANOVA was used to determine significant difference amongst variables. RESULTS: Mean PCSA values of the VL, VI, and VMO were 98.30± 53.94, 128.52±73.38, and 118.03± 89.66mm^2, respectively. The overall model was statistically significant (p=0.048). Planned comparisons between VI and VL were significantly different (p=0.035), however there were no differences between the VI and VMO (p= 0.51) or between the VL and the VMO (p= 0.13). CONCLUSIONS: The results indicate the VI had the greatest PSCA. In contrast, previous findings suggest the VL has the largest PCSA. These differences could be due to variances in methodologies between studies. Alternatively, we found that the VL had the longest fiber length, equating to a lower PSCA, despite greater volume. These results suggest VI could be an important source of muscle force development.

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Primary Presenter / email: Omidy, F. / efom222@g.uky.edu
Student Undergrad
Kinesiology - Division of Physical Therapy

Mentor / e-mail: Noehren, B. / b.noehren@uky.edu