Winter, 2013

UK HealthCare

UK Department of Physical Medicine & Rehabilitation
Division of Research

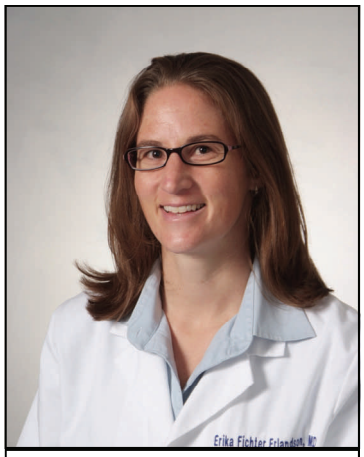
Researchers in Focus Series

Mission Statement: To provide excellence in rehabilitative care through advances in research, education and patient advocacy.

Joe E. Springer, Ph.D.
Professor and Vice Chair for Research
Cardinal Hill Endowed Chair

Welcome to the Winter, 2013 issue of ***Researchers in Focus*** highlighting the research accomplishments of the University of Kentucky's Department of Physical Medicine and Rehabilitation (PM&R) in collaboration with Cardinal Hill Rehabilitation Hospital. The Division of Research in PM&R is made up of basic science faculty, clinical faculty, and rehabilitation research staff and receives research funding from the NIH, Department of Education, American Heart Association, Christopher and Dana Reeve Foundation, and the Morton Cure Paralysis Foundation. This issue recognizes the research of Dr. Erika Erlandson, Assistant Professor in PM&R and a former resident in our program. We also want to showcase our resident research program, which has over 25 active protocols, as well as numerous presentations at national meetings and several peer-reviewed publications.

Researcher in Focus: Erika Erlandson, M.D.



Erika Erlandson, M.D.
Assistant Professor

Erika Erlandson, MD is an Assistant Professor in the Department of Physical Medicine and Rehabilitation (PM&R) who received her medical degree from University of Kentucky. She recently completed her residency in PM&R also at the University of Kentucky. Dr. Erlandson is the attending on the inpatient stroke unit at Cardinal Hill Rehabilitation Hospital and also has a strong interest in Pediatric Rehabilitation.

During her residency, Dr. Erlandson worked on a retrospective study involving ambulatory children with cerebral palsy (CP) in collaboration with Hank White, PT, PhD and Henry Iwinski, MD at the Lexington Shriners Hospital for children. Dr. Jeff Goldberg (a UK orthopedic surgery resident) initially identified this cohort and studied oxygen consumption as an indicator of energy expenditure during walking. Specifically, oxygen consumption during walking was measured before and after single event multilevel surgery (SEMLS) that included hamstring lengthening. Dr. Erlandson's interests focused on the gross motor skills, ambulation status, and functional abilities/mobility of these children before and after hamstring lengthening. Based on these interests, the number of patients in the cohort more than doubled and the study became much more comprehensive as it included all CP ambulators. In this study, the Gross Motor Function Measure (GMFM), Gross Motor Function Classification Score (GMFCS), and Functional Mobility Scale (FMS) were used as indicators of function. Hamstring lengthening as part of SEMLS procedures resulted in a significant decrease in bilateral knee flexion during walking for all participants regardless of GMFMS level. In addition, hamstring lengthening significantly improved gross mobility and functional ambulation in a subset of patients with cerebral palsy, spastic diplegia who ambulate with an assistive device (GMFCS level III). However, the same effect was not observed in GMFCS Level I and II participants. Neither previous surgical intervention nor simultaneous surgical intervention resulted in significantly different changes in functional scores, physical examination measures, walking speed, cadence, stride length or knee flexion at weight acceptance or mid-stance. Overall, *the outcomes of this study suggest that SEMLS interventions may have increased functional benefit for children who ambulate with an assistive device and that these children should be more routinely considered for hamstring lengthening procedures.*

Erika Erlandson, M.D. (cont)

Dr. Erlandson's study was one of three (out of 700) selected for a podium presentation at the American Academy of Physical Medicine and Rehabilitation held in Atlanta, GA in 2012. Dr. Erlandson was honored to be the only resident of the three selected presenters and this recognition is an indicator of the growth of resident research in PM&R. During her Chief Resident year, Dr. Erlandson along with Dr. Hank White at the Shriners Hospital mentored two other PM&R residents on research projects involving this cohort of children. Specifically, Francisco Dr. Angulo-Parker, MD and Dr. Radha Korupolu conducted follow-up studies that further evaluated changes in gait before and after operative intervention in these children. This project is an example of the collaborative research opportunities that exist between the Shriners hospital and the residents/ faculty in the department of PM&R, in addition to ongoing collaborations between the departments of PM&R and Pediatric Orthopedics at UK.

Upcoming Events, Presentations and Publications

Research Day

Steven Kirshblum, M.D.

The 26th Annual Research Day is scheduled for Thursday, May 22, 2014. The program consists of ongoing and planned projects presented by PM&R residents, rehabilitation research projects conducted by students and postdocs from the various University of Kentucky Colleges, as well as clinicians, therapists, and researchers involved in rehabilitation research from Cardinal Hill Rehabilitation Hospital and surrounding areas.

Dr. Steven Kirshblum will serve as the keynote speaker and his talk will focus on spinal cord injury rehabilitation research. Dr. Kirshblum is Professor of Physical Medicine and Rehabilitation at the New Jersey Medical School Rutgers campus. Dr. Kirshblum is nationally recognized for his work in the area of spinal cord injury rehabilitation and research. He joined the Kessler Institute for Rehabilitation in 1990 and currently serves as Medical Director of the West Orange campus, as well as the Director of the Spinal Cord Injury Program. As the Co-Project Director of the Northern New Jersey Model Spinal Cord Injury System, one of only 14 federally designated model systems in the country, Dr. Kirshblum oversees the rehabilitation research and patient care. He is also a professor of rehabilitation medicine at Rutgers New Jersey Medical School and serves as the program director for the Spinal Cord Injury Medicine Fellowship program. Dr. Kirshblum has written and co-authored more than 100 articles in peer-reviewed publications and has completed over 20 book chapters, 80 abstracts, and monographs on his major research interests in spinal cord injury and education issues. He is editor of the textbook, Spinal Cord Medicine, which is considered as the standard in the field. Dr. Kirshblum has been honored by many spinal cord injury societies, and organizations including the American Paraplegia Society, Association of Academic Physiatrists, World Congress of Rehabilitation International and Cerebral Palsy Society of New Jersey. He is the President of the Academy of Spinal Cord Injury Professionals, Chair of the International Standards Committee for the American Spinal Association and a member of numerous advisory boards and foundations for spinal cord research.

Resident Presentations

Effect of Athletics on Activities of Daily Living, Depression & Self-efficacy after Spinal Cord Injury. Sankar Chirumamilla et al., ASCIP 2013.

Art as Therapy in Rehabilitation. Vinod Muniswamy et al., ASCIP 2013.

Knee Hyperextension after Hamstring Lengthening in Cerebral Palsy: Incidence, Predictive Factors and Cost in Gait Efficiency. Francisco Angulo Parker et al., AAPMR 2013.

The Effects of Volitional Preemptive Abdominal Contraction on Postural Control Responses. Nagar Vittal et al., 2013 AAP 2013.

Identification of Sural Nociceptive Flexion Reflex Ratio. Thien Ngo and Oscar Ortiz. AAP 2013.

Resident Publications of Interest

Nagar V, Hooper T, Dedrick G, Brismée JM, Sizer P; The Effect of Recurrent Low Back Pain History on Volitional Preemptive Abdominal Activation During a Loaded Functional Reach Activity. Spine (Phila Pa 1976). 2013 Oct 22

Lord RA; Mayhew CR, Korupolu R, Mantheiy EC, Friedman MA, Palmer JB, Needham DM. ICU Early Physical Rehabilitation Programs: Financial Modeling of Cost Savings. Crit Care Med. 2013 Mar;41(3):717-24.

Kho ME, Truong AD, Brower RG, Palmer JB, Fan E, Zanni JM, Ciesla ND, Feldman DR, Korupolu R, Needham DM. Neuro-muscular electrical stimulation for ICU-acquired weakness: Protocol and methodological implications for a randomized, sham-controlled phase II trial. Phys Ther. 2012 Dec; 92(12):1564-79.

Korupolu R, Gifford JM, Zanni J, Truong A, Vajrala G, Lepre S, Needham DM. Early Mobilization in the Intensive Care Unit: Safety, Feasibility and Benefits. Year Book Respiratory & Applied Technologies (Book Chapter). In Esquinas AM (Ed). Basel, Karger. 2010.

Needham DM, Korupolu R. Rehabilitation Quality Improvement in an Intensive Care Unit Setting: Implementation of a Quality Improvement Model. Top Stroke Rehabil. 2010; 17(4):271–281.An Update of Evaluation of Therapeutic Thoracic Facet Joint Interventions. Manchikanti et al., Pain Physician,15(4):463-481, 2012.

Effectiveness of therapeutic lumbar transforaminal epidural steroid injections in managing lumbar spinal pain. Manchikati et al., Pain Physician,15(3):199-245. 2012.

Improvements in Functional Mobility after Hamstring Lengthening in Ambulatory Children with Spastic Diplegic Cerebral Palsy. Erlandson et al., submitted.

Other Publications

Shandera-Ochsner AL, Berry DT, Harp JP, Edmundson M, Graue LO, Roach A, High WM Jr. Neuropsychological effects of self -reported deployment-related mild TBI and current PTSD in OIF/OEF veterans. Clin Neuropsychol. 27(6):881-907, 2013.

Mason LH, Shandera-Ochsner AL, Williamson KD, Harp JP, Edmundson M, Berry DT, High WM Jr. Accuracy of MMPI-2-RF validity scales for identifying feigned PTSD symptoms, random responding, and genuine PTSD. J Pers Assess., 95(6):585-593, 2013.

Pape TL, High WM Jr, St Andre J, Evans C, Smith B, Shandera-Ochsner AL, Wingo J, Moallem I, Baldassarre M, Babcock-Parziale J. Diagnostic accuracy studies in mild traumatic brain injury: a systematic review and descriptive analysis of published evidence. PMR. 5(10):856-881, 2013.

Chelette KC, Carrico C, Nichols L, Sawaki L. Long-term cortical reorganization following stroke in a single subject with severe motor impairment. NeuroRehabilitation. Vol.33(3):385-389, 2013.

Danzl MM, Chelette KC, Lee K, Lykins D, Sawaki L. Brain stimulation paired with novel locomotor training with robotic gait or-thosis in chronic stroke: a feasibility study. NeuroRehabilitation. Vol.33(1):67-76, 2013.

Chen, A., Sun., S., Visavadiya, N., and Springer, J.E. Differential proteomic analysis of acute contusive spinal cord injury in rats using iTRAQ reagent labeling and LC-MS/MS. Neurochem Res., 38(11):2247-2255, 2013.