Activity-dependent Plasticity and an Emerging Paradigm Shift in NeuroRehabilitation: From Adults to Pediatrics

Saturday, October 26, 2013: 8:30 – 9:30 am; 9:45 – 10:45 am

Speaker: Andrea L. Behrman, PhD, PT, FAPTA

Course Description:

Neuroscientists have determined that the central nervous system, more specifically - the spinal cord, has the capacity to learn. In response to task-specific, repetitive activity, it receives sensory information, integrates it, and yields an output - a motor response. Furthermore, walking is, in part, controlled by a spinal pattern generator that receives input from both descending signals from the brain and from the periphery via sensory input. While perhaps not new to our understanding of the brain, these findings are new to our knowledge of the role of the spinal cord in controlling walking and movements. This evidence has laid the foundation for a paradigm shift in neurorehabilitation and the emergence of activity-based therapies. Such therapies, via repetitive, task-specific practice and progression by challenge target neuromuscular recovery after injury. The aim of activity-based therapies is to activate muscles both below and across the injury promoting return of pre-injury movement capabilities or development of movement (in children who never developed sitting, standing, or walking at the time of injury due to their very, young age). Case examples of adult and pediatric populations will be presented and discussed.

Speaker Bios:

Andrea L. Behrman, PhD, PT, FAPTA
Andrea is a Professor at the University of Louisville, Department of Neurological Surgery and Kentucky Spinal Cord Injury Research Center, Louisville, KY. She served on the faculty of the PT Department at the University of Florida from 1995-2012 and at Beaver College, (now Arcadia University) from 1987-1991 where she taught neurorehabilitation. She received her PhD from the University of Florida, her M.S. in PT from Duke University, and a B.S. in biology from Furman University. She is also co-Director of the Christopher and Dana Reeve Foundation NeuroRecovery Network. Her clinical and research work focus on pediatric rehabilitation and neurorecovery as well as spinal cord injury recovery in pediatrics and adults. Behrman’s work is applied in a clinical setting at Frazier Rehab Institute’s Spinal Cord Injury Program and Pediatric NeuroRecovery Program, part of KentuckyOne Health, Louisville, KY. Her research has been funded by the Foundation for Physical Therapy; the National Institutes of Health; the VA Rehabilitation, Research and Development; the Craig H. Neilsen Foundation; and the Department of Defense.