IC 1 - PART I: APPLYING SELECTIVE DORSAL RHIZOTOMY (SDR) TO IMPROVE GAIT AND AMBULATORY FUNCTION IN THE CHILD WITH CEREBRAL PALSY

Authors: Marcie Ward, MD; Michael H. Schwartz, PhD; Tom Novacheck, MD; Patrick Graupman, MD

Level: Intermediate

Purpose: To educate providers regarding SDR, a collaborative approach to evaluating candidates including gait analysis, the surgery, the rehabilitation and outcome data.

Target Audience: Physicians, surgeons, and therapists who want to know more about SDR, or consider SDR a potential treatment option for their patients.

Course Summary: This course is Part I of a two part course. It will discuss the selection criteria associated with predictable outcomes for tone reduction and improved ambulation after SDR. A multidisciplinary approach will be explained and include selection criteria which suggest a favorable outcome can be predicted if SDR is pursued. Applicable gait analysis principles will be highlighted. Surgical technique and postoperative rehabilitation will be discussed. Research will be presented on short term and long term outcome data. The audience will participate through an electronic audience response system.

Learning Objective 1: Describe characteristics of patients that are consistent with a predictable positive result following SDR.

Learning Objective 2: Learn the benefits of a multidisciplinary collaborative evaluation of the ambulatory patient with cerebral palsy.

Learning Objective 3: Explore the techniques of rhizotomy and the benefits of utilizing a selective approach in the procedure.

Learning Objective 4: Review the post SDR short and long term outcomes data.

IC 2 - EARLY PREDICTION OF CEREBRAL PALSY IN THE YOUNG INFANT BY OBSERVATION OF GENERAL MOVEMENTS

Authors: Colleen Peyton, PT DPT; Lars Adde, PT PhD

Level: Intermediate

Purpose: To bring participants up to date on concepts and research related to the early prediction of cerebral palsy in the young infant by observation of general movements (GMs).

Target Audience: Physicians, physical and occupational therapists

Course Summary: Analysis of GMs, observable at less than five months post-term, has been shown to predict the development of CP with a high degree of certainty. At this age, the characteristics of GMs change if there has been an injury to the nervous system. General movement assessment (GMA) has been described in several studies, and it has been suggested that the method may also predict the development of neurological disorders other than CP. Emerging evidence suggests that a computerized software tool also has the ability to predict cerebral palsy through video analysis of GMs. This session is intended for clinicians and researchers with the goal of understanding the current evidence and concepts surrounding analysis of infant spontaneous movement and the prediction of neurological dysfunction. Video examples of normal and abnormal infant general movements will be presented. The session is not intended as a General Movement Assessment course, but as an introduction to current concepts and research.

Learning Objective 1: Discuss the history and evolution of infant neurological assessment and its clinical implication.

Learning Objective 2: Explain neural mechanisms behind spontaneous movements in the infant.

Learning Objective 3: Describe normal and abnormal forms of infant general movements and their predictive value for neurological impairment.

Learning Objective 4: Discuss current research regarding prediction of cerebral palsy in the infant through analysis of spontaneous movement.
IC 3 - CUTTING EDGE CARE IN EPILEPSY MANAGEMENT, FROM STATE OF THE ART MEDICAL MANAGEMENT THROUGH SURGICAL OUTCOMES

Authors: Maureen R. Nelson, MD; Dave Clarke, MD; Mark R. Lee, MD PhD; Jeff Titus, PhD

Level: Advanced
Purpose: The knowledge base for epilepsy management is exploding currently, with new medications, amazing technology for evaluation, including medication and radiographic combinations, and advancing surgical decision-making options and techniques.
Target Audience: Pediatricians, physiatrists, neurologists, neurosurgeons, physical and occupational therapists, speech and language pathologists, nurses, psychologists
Course Summary: This course will cover interdisciplinary, cutting edge approach to the management of children with epilepsy. The latest technology for evaluation will be shown, including neuropsychological evaluation, imaging, and how these can be used in combination. Use of this information to optimize care will be discussed. A logical treatment approach, including the use of the latest medications and their profiles, dietary management, vagal nerve stimulators, and surgery will be presented. Surgical options will be presented, including rehabilitation interactions.
Learning Objective 1: Refine your medical management of children with epilepsy, including post-brain injury.
Learning Objective 2: Refine your understanding of potential problems with use of anti-epileptic medications.
Learning Objective 3: Develop an understanding of the specificity and precision possible in epilepsy evaluations.
Learning Objective 4: Develop an understanding of surgical approaches in various types of intractable epilepsy.

IC 4 - EREHABILITATION: USING VIRTUAL REALITY TECHNOLOGIES (VRTS) IN REHABILITATION FOR INDIVIDUALS WITH CEREBRAL PALSY

Authors: Roslyn N. Boyd, PhD PT; Louise E. Mitchell, PT MHSt; Darcy Fehlings, MD MSc; Elaine Biddiss, PhD; Betina Rasmussen, OT; Mette Kliim-Due, PT

Level: Basic
Purpose: This course will summarize current evidence and familiarize attendees with VRTs to assist their integration into clinical practice.
Target Audience: Occupational therapists, physiotherapists, physicians and psychologists
Course Summary: This course will provide an overview of the evidence for VRTs used for ERehabilitation of individuals with cerebral palsy (CP). The workshop will focus on a) presenting the development and current evidence for Move it To improve it (Miti), a virtual, web-based and individualized training system, b) discussing current evidence for use of commercially available systems such as “Wii”, and c) reviewing the use of a novel multi-player “Exergame” consisting of a stationary cycling unit powering an avatar in customized computer games. The workshop will include time for attendees to trial these virtual reality platforms.
Learning Objective 1: Review the current evidence for the use of VRTs for ERehabilitation.
Learning Objective 2: Understand clinical frameworks to guide decision making when using ERehabilitation.
Learning Objective 3: Learn current ERehabilitation models adopted in research settings and explore how these might be implemented in clinical practice.
Learning Objective 4: Become familiar with the application of virtual reality technologies as rehabilitation tools.

IC 5 - WHERE DOES THE HIP SIT? MANAGING HIP DISPLACEMENT WITHIN THE OVERALL CONTEXT OF THE CHILD WITH CEREBRAL PALSY

Authors: Pam Thomason, MPT; Kate Willoughby, PhD; Paulo Selber, MD; H Kerr Graham, MD

Level: Intermediate
Purpose: This updated course will focus on the practical application of evidence for the surveillance and management of hip displacement in children with CP. This course will help participants navigate the management options in relation to complex and sometimes competing needs of the child and family.
Target Audience: Physical therapists, paediatricians, orthopaedic surgeons, rehabilitation physicians
Course Summary: In the context of previously presented and new evidence this course will provide an
overview and practical approach to the management of hip displacement. The difficulties of developing and implementing management algorithms will be explored. Participants learning will be enhanced through interactive case studies including management of children with hemiplegia and children for whom the complex nature of their disability extends far beyond the hip. The recently revised Australian Standards of Care for hip surveillance will be presented. The outcome of surgical and non-surgical management including new evidence of the effectiveness of non-surgical options (CAM) explored. Newly developed parent fact sheets will be available along with the revised Australian Standards of Care. A focus will be interactive case studies that will provide participants with rationale to support their decision making about managing hip displacement for children in their care.

Learning Objective 1: Gain knowledge of the evidence for management of hip displacement.
Learning Objective 2: Understand the rationale for and timing of surgical intervention.
Learning Objective 3: Understand the management of hip displacement in relation to severity of the motor disorder and to complex and competing needs of the child.
Learning Objective 4: Gain knowledge of the evidence for long term outcomes of surgical and non-surgical interventions.

IC 6 - ORTHOPEDIC SURGERY FOR ADULTS WITH CEREBRAL PALSY
Authors: M. W. Shrader, MD; Garey Noritz, MD; Henry Chambers, MD

Level: Basic
Purpose: This course will present an overview of typical orthopedic surgical procedures that adults with cerebral palsy (CP) may need. Specifically, the course will present the unique aspects of caring for adults with CP undergoing orthopedic surgery, including preoperative assessment, medical co-management, and postoperative rehabilitation.
Target Audience: Physicians, occupational and physical therapists, nurses
Course Summary: This course will provide an introductory level discussion of orthopedic surgical procedures that adults with CP may undergo. Surgery of the foot, knee, hip, and spine will be briefly discussed, including indications, patient selection, consent issues, surgical techniques, and postoperative care, including a discussion of the unique rehabilitation requirements for adults with CP. A discussion of the issues regarding medical co-management of this patient population will also be presented. Specifically, the course will focus on preoperative assessment, where to do the surgery (children’s hospital vs adult hospital), ICU issues, management of complex medical issues, such as nutritional issues and seizure disorders, and postoperative complications.
Learning Objective 1: To understand some details of orthopedic surgical procedures that are performed on adults with cerebral palsy.
Learning Objective 2: Participants will learn about patient selection in this patient population, with special emphasis on the consent/assent process.
Learning Objective 3: To develop an appreciation for the complex issues requiring medical management of adults with CP undergoing surgery, including preoperative assessment, hospital management, and management of postoperative complication.
Learning Objective 4: To learn about how postoperative care and rehabilitation differs for adults with CP undergoing orthopedic surgery.

IC 7 - TRANSLATING RESEARCH TO PRACTICE: CLINICAL USE OF THE GILLETTE FUNCTIONAL ASSESSMENT QUESTIONNAIRE
Authors: Jean L. Stout, PT MS; Rocio Riveros Charry, PT

Level: Intermediate
Purpose: This course will describe the translation of Rasch Analysis measurement theory research to practice using the Gillette Functional Assessment Questionnaire. Integration of self-report measures, classification systems (GMFCS) and measures of gait pathology will be described.
Target Audience: Physiatrists, nurses, and physical therapists in clinical or school settings who encounter children with cerebral palsy and other gait impairments in their clinical practice.
Course Summary: Characterizing function for a child with cerebral palsy includes reporting multiple assessments in isolation without a common context of how each relates to the other. This course will use a series of case studies to describe the Rasch-derived integration of self-report measures (Gillette Functional Assessment Questionnaire and the PODCI), classification systems (GMFCS), and measures of gait pathology (Gait Deviation Index (GDI)). The usefulness of the FAQ in a clinical or school setting to providing direction for therapies and in counseling families regarding expectations of skill abilities will be demonstrated. Age dependence of skills for typically developing children will also be discussed.
Learning Objective 1: Discuss how the FAQ may be used in the clinical setting to provide direction for therapies and parent expectation of skill abilities.

Learning Objective 2: Explain how GMFCS levels and a gait pathology index (GDI) are related to walking levels and skills on the FAQ.

Learning Objective 3: Describe the differences in skill difficulty between typically developing children and those with gait impairment.

Learning Objective 4: Describe the application of Rasch Analysis to the integration of selected measures.

IC 8 - THE ICF IN RESEARCH AND CLINICAL PRACTICE
Authors: Stephanie C. DeLuca, PhD; Charlene Butler, EdD; Benjamin J. Shore, MD; Linda E. Krach, MD; Kat Kolaski, MD

Level: Basic
Purpose: Participants will gain understanding of and improve skills in using the International Classification of Functioning, Disability, and Health (ICF) framework and the ICF version for Children and Youth (ICF-CY).

Target Audience: AACPDM Members

Course Summary: The ICF is a conceptual framework utilizing specific terminology to describe health across the lifespan. It has been adopted by over 90 countries and endorsed by 191 WHO members. The ICF includes 3 major domains: body function and structure; activities; and participation. Domains are supplemented by consideration of environmental and personal contextual factors, and are defined within multiple categories using universal qualifying codes to promote precise descriptions. The ICF-CY is designed to capture specific functional characteristics affecting the developing child. The AACPDM’s Treatment Outcomes Committee’s (TOC) methodology for systematic reviews requires authors report outcomes using the ICF model. As communications become more global, it is increasingly important for clinicians and researchers to use a common language when describing outcomes as they critically appraise and disseminate information. The ICF framework provides such a common language; however, use of the ICF framework can be challenging. Representatives of the TOC will present information to better enable AACPDM members to understand, access, and apply the ICF framework. Presenters will review the conceptual strengths of the ICF, outline the ICF model and its components, give practical illustrations of the coding system, and consider its limitations. They will explore and highlight the relationship between the ICF-CY and available childhood health and disability measures as used by clinicians and researchers. Audience members will have an opportunity to discuss ways to promote the ICF measures when reporting outcomes in future publications and presentations.

Learning Objective 1: To understand the ICF and ICF-CY components.
Learning Objective 2: To recognize strengths and limitations of the ICF model.
Learning Objective 3: To understand how currently available childhood disability and health measures are aligned with the ICF-CY.
Learning Objective 4: To promote discussions about the ICF for a wide array of clinical and research purposes.

IC 9 - THE YEAR’S TOP TEN ARTICLES ON DEVELOPMENTAL DISABILITIES
Authors: Gordon Worley, MD; Richard C. Adams, MD

Level: Intermediate
Purpose: To present summaries of the ten most important articles on developmental disabilities published in the past year (2011 to 2012), and to encourage discussion about them by participants.

Target Audience: Physicians and nurses who treat children with developmental disabilities and want to keep abreast of the latest evidence-based, scientific findings that have the greatest impact on care. Although therapists are welcome and some articles may be relevant to their practices, most papers will have a medical focus.

Course Summary: The top ten clinically relevant articles published in English between Autumn 2011 and Summer 2012 will be presented to the audience. Articles will be chosen from the presenters’ personal experience as well as from searches in Medicine and CINAHL (Current Information in Nursing and Allied Health Literature). Categories from which the articles will be chosen include the following: attention deficit hyperactivity disorder, autism, cerebral palsy, Down syndrome, mental retardation, spina bifida, and spinal cord injury. They will be selected using the following criteria: (1) impact on clinical care, (2) scientific merit of the study [validity], and (3) generalizability to practice. The presenters will summarize the ten articles in reverse order (saving number one for last). Their impact on clinical practice, place in the context of current care, and their implications for future research will be discussed. The audience will be encouraged to respond to each article as it is presented. A copy of the references and abstracts will be given to the
Learning Objective 1: Summarize the major conclusions of each of the ten articles presented.
Learning Objective 2: Identify areas in which additional research is needed.
Learning Objective 3: Evaluate the utility of each of the articles for their own clinical practice.
Learning Objective 4: Be inspired by the presentations to seek articles on their own.

IC 10 - PEDIATRIC SCI IN INFANTS AND YOUNG CHILDREN
Authors: Lawrence C. Vogel, MD; Kathy Zebracki, PhD; Mary J. Mulcahey, PhD

Level: Intermediate
Purpose: Highlight innovative aspects of caring for young children with SCI.
Target Audience: Physicians and AHP
Course Summary: Overview of pediatric SCI, including epidemiology as a function of age at injury and management of medical/orthopaedic complications unique in children under 5 years of age. Discuss neurological evaluation and classification in young children with SCI. Highlight psychosocial and sexuality issues for children with SCI and their families. Review rehabilitation and habilitation of young children with SCI. Conclude with 2 case presentations with workshop attendee participation
Learning Objective 1: State the incidence of scoliosis and indications for bracing.
Learning Objective 2: State the limitations of using the ISNCS in children 5 years and younger. 
Learning Objective 4: State the youngest age that a child could begin using a power wheel chair.

IC 11 - THE IMPORTANCE OF BEING EARNEST ABOUT SHANK AND THIGH KINEMATICS WHEN DESIGNING, ALIGNING AND TUNING ANKLE-FOOT ORTHOSIS FOOTWEAR COMBINATIONS (AFO-FCS)
Authors: Elaine Owen, MSc SRP MCSP; Deborah Gaebler-Spira, MD; Stefania Fatone, PhD BPO; Donald McGovern, CPO

Level: Intermediate
Purpose: This course aims to introduce participants to the importance of segment kinematics in understanding and classifying standing and gait as well as designing, aligning and tuning AFO-FCs. This approach will be placed within the context of the International Classification of Function.
Target Audience: Relevant to clinicians and researchers including physical therapists, orthotists, rehabilitation engineers, pediatric neurologists, pediatric orthopaedic surgeons, pediatric physiatrists, paediatricians, kinesiologists
Course Summary: Maximizing mobility and function often includes the use of orthoses. This course presents a fresh approach to the analysis of normal and pathological standing and gait. Many current myths about standing, gait and orthotic intervention will be challenged and their origins explored e.g. the commonly held notion that the ankle angle in an AFO should be neutral. A more objective understanding of standing, gait and optimum orthotic intervention will be offered. Video Vector and 3D gait lab examples will include use of un-tuned and tuned AFO-FCs for standing and gait. Printed handouts and CD provided
Learning Objective 1: Discuss the kinematics and kinetics of normal and pathological gait and standing, with equal emphasis on segment and joint kinematics.
Learning Objective 2: Categorize pathological gait by segment deviation.
Learning Objective 3: Discuss a clinical algorithm to determine the optimum sagittal ankle angle in an AFO.
Learning Objective 4: Discuss a clinical algorithm to design, align and tune AFO-FCs.

IC 12 - DIAGNOSTIC APPROACH TO THE ATAXIC CHILD
Authors: Andrea Poretti, MD; Hilary Gwynn, MD; Alec Hoon, MD

Level: Intermediate
Purpose: To provide a diagnostic approach to the ataxic child based on clinical history, neurological examination, and in depth identification of the clinical manifestation of motor, cognitive, and additional investigations.
Target Audience: Clinicians involved in the diagnostic evaluation of children with ataxia.
Course Summary: Ataxia comes from the Greek and means “lack of order”. In medicine, ataxia refers to impaired ability to coordinate muscle activity in the execution of voluntary movements. An unsteady, broad-
based gait is the main clinical manifestation of ataxia. Additional clinical findings may be present depending on the etiology of ataxia. Generally, lesions affecting 3 main systems may cause ataxia: cerebellum, sensory and vestibular system. Additionally, ataxia may be functional or psychogenic. According to the amount of time over which symptoms present and evolve, different forms of ataxia have been defined: non-progressive, progressive, acute, episodic, and intermittent. Based on selected, illustrative clinical situations, we will discuss how clinical history, neurological examination and additional investigations (e.g. neuroimaging, electrophysiology, laboratory investigations) may help to differentiate between the different forms of ataxia in children.

**Learning Objective 1:** The participant will identify the different systems that, if affected, may cause ataxia.

**Learning Objective 2:** The participant will recognize the role of clinical history and neurological examination in differentiating pediatric ataxia secondary to cerebellar, sensory, and vestibular lesions and functional ataxia.

**Learning Objective 3:** The participant will recognize the targeted indication of additional investigations in pediatric ataxia.

**Learning Objective 4:** The participant will identify common etiologies of the different ataxia types in children.

**IC 13 - ADVANCES IN THE NEUROPSYCHOLOGY OF CEREBRAL PALSY**

**Authors:** Seth A. Warschausky, PhD; Jacqueline Kaufman, PhD; Heidi Hapaala, MD

**Level:** Intermediate

**Purpose:** To improve clinicians’ understanding of attention, executive function, visuospatial and other neuropsychological risks associated with CP including brain-behavior relations that underlie cognitive impairments. To describe neuropsychological applications to medical practice including monitoring iatrogenic effects, examining treatment outcomes, and formulating school recommendations.

**Target Audience:** This course is designed for physicians, therapists and educators who treat children with CP, and researchers who examine cognitive factors.

**Course Summary:** Faculty from the University of Michigan’s Adapted Cognitive Assessment Laboratory (ACAL) illustrate key concepts in the neuropsychology of CP with findings from the NIH and DOED/NIDRR funded studies of 170 children with CP. An overview of cutting edge understandings of the neuropsychology of CP incorporates these findings. Practice guidelines and empirically grounded applications to clinical practice are described.

**Learning Objective 1:** To review the nature of neuropsychological assessment and new developments in accessible tests of cognitive functions.

**Learning Objective 2:** To refine knowledge of specific neuropsychological risks associated with CP.

**Learning Objective 3:** To refine understanding of the neuropathology associated with specific neuropsychological risks.

**Learning Objective 4:** To develop an understanding of the important clinical applications of neuropsychological assessment of children with CP.

**Instructional Course has been added to Thursday, October 17, 2013 Instructional Course offerings.**

**IC 32 - USE OF GAIT ANALYSIS IN SURGICAL TREATMENT PLANNING FOR PATIENTS WITH DEVELOPMENTAL DISABILITIES**

**Authors:** Robert M. Kay, MD; Deirdre Ryan, MD; Susan Rethlefsen, PT DPT

**Level:** Intermediate

**Purpose:** To educate attendees in use of gait analysis for evaluation and treatment planning for children with developmental disabilities.

**Target Audience:** Physicians, physical and occupational therapists

**Course Summary:** Faculty will introduce attendees to computerized gait analysis data collection and interpretation. They will discuss how data are used in planning for surgical and non-surgical intervention in children with CP and myelomeningocele. Discussion will focus on common clinical problems and ways gait analysis alters treatment plans. Content will be based on the presenters’ clinical expertise and evidence-based review of literature. Computerized gait data, videos, photographs and x-rays will be used. Attendees will participate in breakout sessions in which gait data will be interpreted and treatment plans determined for sample cases.

**Learning Objective 1:** List common gait problems in CP and myelomeningocele.

**Learning Objective 2:** Identify deviations on joint kinematic, kinetic and EMG plots.

**Learning Objective 3:** Outline a treatment plan for a child with CP or myelomeningocele using gait analysis data.
**Learning Objective 4:** Gain perspective on the complexity of evaluation and treatment planning for children with developmental disabilities.