

Abstracts

Friday, September 15

7:00 AM - 9:00 AM

1.) Pediatric Hypertonia: What is It and How Do We Measure It?

Darcy L. Feblings, MD, MSc; Diane Damiano, PhD; Janice Brunstrom, MD

Course Level: Basic/Intermediate

Target Audience: Pediatricians, Neurologist, Psychiatrists, Physiotherapists, Occupational Therapists, Nurses, Rehabilitation Engineers

Purpose: This course will define the different types of pediatric hypertonia including spasticity, dystonia and rigidity. The principal focus will be on hypertonia measurement and will be divided into two main sections: clinical measurement tools and biomechanical instrumentation. The psychometric properties and application of the measures will be reviewed with a focus on how to incorporate measurement into clinical practice.

Course Summary: Differentiating different types of pediatric hypertonia is becoming increasingly important as treatments are becoming more specialized depending on which type of tone is predominant in the child. The definitions of spasticity, dystonia, and rigidity will be reviewed and features of the neurological examination to diagnose the different types of hypertonia will be presented. Clinical hypertonia measurement tools will be discussed and include the Modified Ashworth Scale, the Tardieu Scale, and the Barry Albright Dystonia Scale. A focus of the discussion will be on how to administer the scales, the psychometric properties, and their applicability in a clinical setting. Biomechanical instrumentation measures including the stretch reflex threshold, the ramp and hold test, sinusoidal oscillation, and a dystonia motion analysis will be reviewed. Their applicability within a clinical and research setting will be discussed. Case examples will be presented that highlight the diagnosis of different types of hypertonia, and the use of clinical and instrumentation hypertonia measurement tools to facilitate clinical decision making. Audience participation in the clinical decision making will be sought.

2.) Advanced Brain Imaging and Neuroplasticity in Children with Cerebral Palsy

Roslyn N. Boyd, Ph; *Marijke Eyssen, MD*; Andrea Guzzetta, MD, PhD

Course Level: Intermediate

Purpose: The course examines the link between brain damage, brain plasticity and functional outcome in children with cerebral palsy. Participants will be introduced to current knowledge on this domain as unraveled by advanced brain imaging and multimodal technical assessment of the brain. Basic principles will be discussed extensively but also recent advances and the clinical implications.

Target audience: Health professionals interested in the link between brain damage, brain plasticity and functional outcome in cerebral palsy. This course is very current and relevant to researchers and clinicians including physicians, paediatricians, rehabilitation specialists, psychologists, neurosurgeons, physical occupational therapists and speech therapists.

Course Summary:

The course will examine the basic principles of recent brain imaging techniques like functional (fMRI) and diffusion weighted/tensor imaging (DWI, DTI) as well as multimodal technical assessment of the brain with the combined use of fMRI, dtMRI, transcranial magnetic stimulation (TMS) and MEG. Practical aspects on achieving good quality images and compliance in young children and designing appropriate paradigms to examine research questions will be discussed. The correlation between lesion type on structural MRI and timing of brain insult will be explained. The contribution of fMRI and other techniques to the understanding of brain plasticity and reorganization after early brain lesions in CP will be presented, with emphasis on the motor, somatosensory and language system in congenital hemiparesis. Aspects of neuroplasticity as recently discovered by members of the team will be highlighted. The possible contribution of fMRI on studying treatment effects will also be covered.

3.) Two-Dimensional Video Gait Analysis: Applying the Lessons From Three Dimensional Gait Analysis

Adrienne Harvey, PT; Jill Rodda, PT; H. Kerr Graham, MD

Course Level: Intermediate

Purpose: Not all clinicians and not all children have access to 3D gait analysis for every clinical encounter. The purpose of this course is to apply the principles from 3D gait analysis to clinical decision making and trouble-shooting in children with cerebral palsy by correlating 2D video gait analysis with other clinical and functional measures.

Target Audience: Orthopaedic surgeons, physicians and physical therapists involved in the management of gait abnormalities of children with cerebral palsy.

Course Summary: The group from the Hugh Williamson Gait Laboratory in Melbourne have 10 years experience of 3D gait analysis as well as two-dimensional video gait analysis with many children as part of the clinical service, particularly post-surgical monitoring. This course will cover the technical set-up required and the principles of video gait analysis using lessons from 3D gait analysis, emphasizing the interaction of different levels and planes of motion at different times in the gait cycle. The correlation of other clinical and functional measures to gait analysis will be included as well as gait patterns in children with cerebral palsy and the orthotic and surgical management for these different gait patterns.



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Five detailed case studies will be presented in an interactive format to illustrate the principles involved and the value of video gait analysis when combined with clinical examination and mobility scales. These will demonstrate decision-making and trouble-shooting, particularly post-operatively.

4.) **RESOLVED: Home-Based Care is the Best Way to Raise Children with Severe Disabilities**

Nancy A. Murphy, M; Teresa Such-Neibar, DO; Deirdre Caplin, PhD

Course level: Intermediate to Advanced

Purpose: To examine the evidence for and against the care of children with severe disabilities and technology-dependence in home-based and congregate care settings. This course will be presented as an interactive debate with participation of attendees.

Target audience: This course targets health professionals and paraprofessionals who care for children and adolescents with developmental disabilities, including pediatricians, pediatric sub specialists, educators, psychologists, social workers, care managers, physical therapists, occupational therapists, and speech therapists, as well as families and caregivers of children with disabilities.

Course Summary:

Historically, hospital or institutional care was the only treatment available for most children with complicated medical and developmental needs. Formal home care now offers the option of home and family-based care. However, increasing survival rates of children with disabilities and technological advances mean that parents are shouldering more caregiving responsibilities of increasing complexity for their children at home. Congregate care settings may provide a means of reducing family stress while improving physiologic and developmental outcomes for children with disabilities. What evidence informs family decisions regarding congregate care versus home care? Should congregate care remain an option for families or should all children be cared for at home? This course attempts to interactively address these questions through a debate-based presentation of the current evidence regarding the care of children with severe disabilities and technology-dependence in home-based and congregate care settings. Implications for the child, caregiver, family and society will be explored.

5.) **ADHD in Children with Disabilities: Neurobiologic, Diagnostic, and Psychopharmacologic Issues**

Michelle M. Macias, MD, Glen P. Aylward, PhD

Course Level: Intermediate

Purpose: Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common behavioral disorders of childhood. Children with disabilities (CWD) have increased rates of attentional and executive function problems. This instructional course is designed to provide a framework for diagnosis, evaluation and treatment of ADHD in children with disabilities.

Target audience: All health care providers

Course Summary: This course will provide an in-depth review of ADHD, the increased vulnerability for ADHD in children with disabilities, and special considerations regarding the diagnosis and management of ADHD in children with disabilities. The course will be structured as follows:

1. Diagnostic considerations-review of diagnostic criteria for ADHD and how modifications may be needed for CWD
2. Neurobiologic basis of ADHD-discussion of prefrontocortical and subcortical processes and pathophysiological model of ADHD, including neuroimaging studies
3. Neuropsychology of ADHD-review of executive function and enhanced vulnerability of EF in CWD.
4. Genetics of ADHD
5. Treatment of ADHD in CWD-literature review of medication treatment studies of selected populations of CWD (youth with mental retardation, traumatic brain injury, myelomeningocele, cerebral palsy); review of psychopharmacologic interventions for ADHD.

6.) **Evaluation and Treatment of Sleep Disorders in Children with Cerebral Palsy and Developmental Disorders**

Ronald E. Becker, MD

Course Level: Intermediate

Purpose: To acquaint those who care for children with Cerebral Palsy or other special health care needs to relevant issues in sleep medicine and sleep behaviors and to provide guidance for treatment of sleep difficulties.

Target Audience: Clinical or Non-Clinical care providers

Course Summary: Children and Adults with Cerebral Palsy are at risk for a range of sleep disorders. This course will discuss the biology and behavioral elements of normal sleep and the ways in which sleep disorder



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ders can emerge. Behavioral sleep disorders, insomnia, and obstructive sleep apnea will be discussed. The effect of relevant medical disorders, including seizures and medication side effects on sleep will be discussed. The effects of poor sleep on health will be discussed. Strategies for solving sleep problems and treating sleep disorders will be discussed in a case-based format, with time left for individual questions.

7.) Physical Therapy and Orthotic Management of Children with Myelomeningocele

Stephanie B. Figlioli, MP; Brigid C. Driscoll, CO, PT

Course Level: Basic

Purpose: To introduce health professionals and others with minimal knowledge to physical therapy assessment, treatment, and orthotic intervention of children with myelomeningocele.

Target Audience: This course will be relevant to physical therapists, occupational therapists, nurses, physicians, orthotists, educators, and others involved in the care of this population.

Course Summary: This course is designed to be an introduction to the evaluation and the treatment of children with myelomeningocele. The course will begin with a discussion of the importance of early intervention, especially the first year of life. Orthopedic and neurological considerations will be discussed, including muscle testing and its relationship to tethered cord. An overview of splinting and orthotic options will be presented. Case presentations will be used to illustrate challenges in assessing these patients to determine appropriate treatment and orthotic intervention

8.) Shifting Your Therapy Gears: Developing Family-Centered Functional Outcomes

Andrew M. Morgan, MD

Course Level: Basic

Purpose: To provide a practical methodology for developing family-centered functional outcomes to direct therapy services, and to provide a forum for sharing ideas regarding this process

Target Audience: Health care professionals who provide therapy services to children and families

Course Summary: The focus of therapy services at national meetings has shifted from a model that emphasizes therapeutic goals to one that emphasizes functional outcomes. Unfortunately, therapists in many communities have often found it difficult to translate this philosophy into practice. In addition, physicians who prescribe therapy services often have limited knowledge of this approach.

This course will provide a practical methodology to guide the development of family centered functional outcomes. We will begin exploring the philosophical basis of the shift to functional outcomes. We will

then review a step-by-step process to develop functional outcomes, with practical examples of each step. Case studies will be presented, with a checklist to assess the quality of outcomes. The session will conclude with a discussion forum among the participants regarding current methodologies that are being used in programs to address functional outcomes.

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1:30 PM - 3:30 PM

9.) Models of Upper Limb Training in Children with Cerebral Palsy - Do We Achieve What We Want?

Roslyn N. Boyd, PhD; Andrew Gordon, PhD

Level: Intermediate, This workshop is interest to all clinicians and researchers working with children with congenital hemiplegia.

Purpose: This workshop will examine the efficacy, content and context of the current theories and approaches to upper limb training in children with cerebral palsy. The presenters will combine their research and clinical experience to debate and critique current training paradigms in the context of theories of motor learning and the effectiveness of upper limb training in promoting activity and participation.

Target Audience: Health professionals involved in the research and management, prescription and provision of upper limb training for children with cerebral palsy and use of adjunctive treatments such as BTX-A, casting and orthoses.

Course Summary: The presenters will combine their research experience and critique other current upper limb trials in cerebral palsy to conduct a discussion on the current research paradigms in the context of theories of motor learning and the effectiveness of upper limb training for promoting activity and participation. Current and new approaches to upper limb training (motor learning, goal directed training, CIMT, bimanual training) will be critiqued to highlight optimal context, dosage, and content of training in a lively interactive debate. A secondary focus of the symposium will be to evaluate the role of adjunctive treatments such as BTX-A, casting, soft splinting for children with cerebral palsy. Studies will be presented in the context of the ICF model and suggestions for future directions of research and clinical practice will be highlighted. An interactive approach with clinical case studies and research data will be used to highlight different options for management.



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10.) The Year's Top Ten Articles on Developmental Disabilities

Gregory S. Liptak, M; Gordon Worley, MD

Course Level: All

Purpose: To present summaries of the ten most important articles on developmental disabilities published in the past year (2005-2006)

Target Audience: Physicians, nurses and others who treat children with developmental disabilities and want to keep abreast of the latest scientific findings that have the greatest impact on evidence-based care

Course Summary: The top ten clinically relevant articles published in English between Autumn 2005 and Summer 2006 will be presented to the audience. Articles will be chosen from the presenters' personal experience as well as from searches in Medline and CINAHL (Current Information in Nursing & 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 practices. 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 attendees.

11.) Pediatric Spinal Cord Injuries: Specialty Topics

Lawrence C. Vogel, M; Caroline J. Anderson, PhD

Course Level: Intermediate/advanced

Target Audience: This course is applicable to physicians and allied health professionals who care for children who have sustained a SCI.

Purpose: The purpose of this course is to highlight from an interdisciplinary focus innovative aspects of pediatric SCI, including new advances in acute and chronic management and sexuality.

Course Content: The course will begin with an overview of pediatric SCI, including epidemiology as a function of age at injury. The next discussion will provide an overview of research on regeneration and injury modulation during both acute and chronic SCI. The next presentation will highlight the psychological consequences of a potential SCI "cure". The next two presentations will review sexuality, including anatomy, pathophysiology, psychosocial, and management.

12.) Management of CP Movement Disorders Other Than Spasticity

A. Leland Albright, MD; Deborah McLeish, MD; Susan S. Ferson, MSN

Course Level: Intermediate

Purpose: To describe the evaluation, treatment and outcomes of treatment of the movement disorders associated with CP, other than spasticity.

Target Audience: Psychiatrists, Physical Therapists, Occupational Therapists, Nurse Practitioners, Nurses, Neurologists

Course Summary: Children with CP often have dystonia, athetosis, or chorea, and sometimes have ballism, myoclonus or tremor. Those movement disorders will be defined and demonstrated with videotapes. Videotapes of children with mixed movement disorders will also be shown. The use of oral medications, botulinum toxin, neurosurgical procedures and rehabilitation for the movement disorders will be described, as well as the treatment outcomes.

13.) The Role of Clinical Pattern Recognition and Sonography in the Management of a Child with Cerebral Palsy

Kerr H. Graham; Steffen Berweck, MD; Florian Heinen, MD

Course Level: Intermediate

Purpose: Practical course to recognize and to understand clinical patterns in children with spastic CP to make critical decisions on target muscles before intervening with Botulinum Toxin. Using technique of sonography-guided injection. A joint demonstration to achieve best possible treatment results.

Target Audience: Users of Botulinum toxin therapy in children, including neuropaediatricians, neurologists, orthopedic surgeons, physiotherapists and others.

Course Summary: Medical decision-making requires recognizing patterns and understanding. This course aims to familiarize the participants with clinical patterns and their underlying pathology in children with spastic CP in order to make critical decisions on key muscles before intervening with Botulinum Toxin. This considers positive and negative features of an upper motor neuron lesion and recommendations on concomitant treatment. The course incorporates proper identification and injection of muscles and therefore includes a critical appraisal of different injection techniques with a special focus on sonography-guided injection. Pattern recognition of sono-anatomy by means of cross-sectional illustrations and sonograms will enable the participants a visually-guided and quick approach to identify especially small and deep-seated muscles and to improve their knowledge on individual anatomy. Hands-on experience in small groups will be provided.



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14.) Computer Adaptive Testing of Physical Functioning in Children with Cerebral Palsy

Stephen M. Haley, PhD, PT; Carole A. Tucker, PhD, PT, PCS

Course Level: Basic to Intermediate

Purpose: To introduce health professionals with minimal knowledge of contemporary methods of instrument development and validation to the advantages of using computer adaptive testing to streamline and improve clinician- and parent-report questionnaires used to assess the outcomes of services for children with cerebral palsy.

Target Audience: Health professionals and researchers who routinely collect outcome questionnaires for clinical or research purposes with little knowledge of contemporary approaches to the development of surveys and questionnaires. This course will be relevant to pediatricians, physical therapists, occupational therapists, speech therapists, psychologists, administrators, neurosurgeons and others who use outcomes data.

Course Summary: This course will introduce health professionals with the rationale and logic of (1) developing instruments using item response theory, and (2) using a computer interface to provide a tailored assessment for each child.

The course will start with a discussion of basic deficits of current questionnaires used in outcomes assessment. A brief discussion of contemporary approaches (non-statistical) will be presented. There will then be a demonstration of a computer adaptive test with audience participation and discussion. We will identify the steps needed to build this system and update progress of a computer adaptive testing program started at Shriners Hospital for Children in Philadelphia and Montreal. Participants will have time to discuss and ask questions of presenters.

15.) Rehabilitation Treatment Guidelines following Orthopaedic Surgery in the Individual with Cerebral Palsy: Why, What & How

*Sherry I. Backus, PT, DPT, MA; Catbi M. Wagner, PT, MBA;
Deborah Corradi-Scalise, PT, DPT, MA, Amanda R. Sparrow, PT;
David M. Scher, MD*

Course Level: Basic

Purpose: To introduce the participants to the basics of orthopaedic surgical intervention and the rehabilitation following surgery in the individual with cerebral palsy. This course will present some of the most common orthopaedic procedures; the use of clinical, radiological and gait analysis measures to select a procedure; an overview of surgical approaches; and the subsequent rehabilitation.

Target Audience: Health professionals and paraprofessionals who treat individuals with cerebral palsy. This course would be relevant to physical, occupational and speech therapists, pediatricians and others who

are not familiar with orthopaedic surgical interventions or wish to better understand the factors that influence the choice of and recovery following orthopaedic surgery.

Course Summary: This course will present an overview of the types of orthopaedic surgery commonly performed in the management of individuals with cerebral palsy. Soft tissue lengthenings and transfers as well as bone procedures of the hip, knee, ankle and foot will be presented. The decision making process for each, including the use of clinical examination, radiologic findings and gait analysis will be discussed. There will be an emphasis on the rehabilitation during the entire course of recovery and return to function following these procedures, including rehabilitation following single-event multilevel surgery. Treatment guidelines, evaluation-based progression, precautions and practical tips will be discussed. Case examples will be included in this comprehensive, team based approach to treating the individual with cerebral palsy following orthopaedic intervention.

16.) Idiopathic Hypotonia: Evaluation, Treatment, and Outcome

Andrew M. Morgan, MD

Course Level: Basic

Purpose: To assist physicians and therapists in the evaluation and treatment of infants and young children with generalized, idiopathic hypotonia

Target Audience: Physicians and health professionals who evaluate and treat children with neurodevelopmental disabilities

Course Summary: Most physicians and therapists are very familiar with the evaluation and treatment of children with spasticity and dystonia. There is much less information available about children with hypotonia, particularly those who do not have a specific genetic or neuromuscular disorder. This course focuses on the evaluation, treatment and outcome of children who have delayed motor development because of generalized, non-specific hypotonia.

The course will begin with a discussion of the clinical presentation and neurodevelopmental evaluation of the child with hypotonia. The differential diagnosis will be explored, with a specific focus on idiopathic hypotonia of central nervous system etiology. General and specific treatment strategies, and the spectrum of outcomes will be discussed. Outcome data will be presented, and the participants will be encouraged to share their own experiences.



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1:00 PM - 3:00 PM

17.) Measuring the Quality of Life of Children with Cerebral Palsy

Elise C. Davis, PhD; *Elizabeth B. Waters, DPbi*; Roslyn N. Boyd, PhD MSc

Course Level: Basic

Purpose: To provide comprehensive information on the measurement of health related quality of life in children with cerebral palsy. The workshop will examine the efficacy, theoretical construct, utility of current measures of HRQOL in children with CP. The rationale and clinimetric properties of a new condition specific measure of HRQOL the CCP-QOL will be presented.

Target Audience: Researchers and clinicians interested in understanding and measuring the quality of life of children with cerebral palsy.

Course Summary: This workshop will include a comprehensive literature review of generic and condition-specific instruments and a thorough examination of the major dimensions to evaluate QOL and HRQOL instruments. This discussion will be facilitated by examples of the authors' new QOL instrument for children with cerebral palsy (Cerebral Palsy QOL Questionnaire for Children CP QOL-Child; Water et al., 2005). There will also be a discussion of the interpretation of existing QOL instruments.

18.) Advanced Interpretation of Clinical Gait Analysis Data in Children with Spina Bifida

Luciano Dias, MD; Nicholas J. Gryfakis, MS; Claudia Kelp-Lenane, PT; Michael N. El-Shammaa, MS; Kelly L. Lenard

Course level: Advanced

Purpose: To provide specialized tools and interpretation methodologies when analyzing the gait of children with spina bifida using 3D gait analysis. This diagnosis specific interpretation will assist in developing effective treatment plans for children with spina bifida.

Target Audience: Health professionals who are involved in the care of children with myelomeningocele and professionals involved in the interpretation of gait analysis data. This course is relevant to orthopaedic surgeons, physiatrists, physical therapists, biomedical engineers, and kinesiologists.

Course Summary: The course will begin with a brief summary of ambulatory issues in children with spina bifida. Next, the course will explain a gait analysis protocol for children with spina bifida including a diagnosis specific physical evaluation. The majority of the course will focus on the use of clinical gait analysis when interpreting the gait of children with spina bifida. Several case studies will be presented in depth covering a range of physical and ambulatory abnormalities often

seen with this diagnosis. Examples of case studies include patients with: Hip and/or knee flexion contractures, hip adduction contractures, hip rotational deformities, and tibia rotational deformities. Attendee participation will be encouraged as presenters identify expected "normal" and "abnormal" gait patterns given the patient's lesion level, ambulatory status, and physical examination findings. The course will also cover indicators an orthopaedic surgeon should utilize when considering specific surgical interventions.

19.) Measurement Tools: Gillette Children's Experience

Tom Novacheck, MD; Raymond Tervo, MD; Sue Murr, PT

Course Level: Basic

Purpose: Present the utility of various available tools to measure the status and changes in the lives of children with cerebral palsy and challenges to their implementation in a clinical setting.

Target Audience: Health professionals who face the challenge of implementing measurement tools in their clinical practice with children who have cerebral palsy. This will be relevant to pediatricians, pediatric orthopaedists, pediatric rehabilitation medicine physicians, pediatric neurologists, physical and occupational therapists, speech and language pathologists, nurse practitioners, nurses, psychologists, and others who use measurement tools.

Course Summary: This course will summarize Gillette Children's experience with various tools to assess function and development of children with cerebral palsy. Included will be established tools (Child Development Inventory, WeeFIM, GMFM, and PODCI) and tools developed at Gillette Children's (Functional Assessment Questionnaire and Gillette Gait Index.)

Because children with cerebral palsy may have impairments and functional limitations in many domains, a number of tools are necessary for comprehensive evaluation. This course will discuss the challenges of using measurement tools in a busy clinical setting, including selection of tools based upon accuracy, different ages and levels of function, sensitivity to area of interest, collection, storage and evaluation of data, and application of information learned to clinical practice. Case examples will be used to illustrate the pros and cons of the various tools.



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20.) Determining Upper Extremity Surgical & Therapeutic Interventions for Children with Cerebral Palsy: A Systematic, Segmental, Video-Based Analysis of Upper Extremity Function in Children with Cerebral Palsy: Use of the Shriners Hospital Upper Extremity Evaluation (SHUEE)

Laura C. Peace, OT; *Jon R. Davids, MD*; Lisa V. Wagner, OTR

Course Level: Basic

Purpose: To introduce health professionals to a reliable, validated video based, clinical tool for the assessment of upper extremity function and surgical intervention in children with cerebral palsy.

Target Audience: Health professionals and paraprofessionals who are interested and/or involved in decision making for upper extremity surgical intervention, trending upper extremity function, or documenting outcome from therapeutic or surgical intervention of the upper extremity for children with cerebral palsy. This course will be relevant to occupational therapists, physical therapists, pediatric orthopaedic surgeons, cerebral palsy clinical coordinators, administrators and others.

Course Summary: This course will provide an overview of the rationale and development of the Shriners Hospital Upper Extremity Evaluation (SHUEE). The test consists of two sections and takes 15 minutes to administer. The first section evaluates the patient through standard measurements of active and passive range of motion (ROM), tone, and a history-based assessment of the performance of activities of daily living. The second section evaluates the spontaneous use of the involved extremity and the segmental alignment of the extremity while performing a series of tasks on demand.

Participants will learn how to perform the SHUEE, and how to score and interpret the study. Illustrative cases will include children completing the evaluation pre/post botulinum toxin and pre/post surgery. Surgical outcome and recommendation will also be reviewed. Participants will then have the opportunity to practice application of the SHUEE by viewing and scoring selected cases independently.

21.) Using Joint Kinetics as a Tool for Evaluating Orthosis Function

Sylvia Ounpuu, MSc; Melany Westwell, MS, PT; Dawn Roller, PT

Course Level: Intermediate

Purpose: The purpose of this tutorial is to 1) provide the needed background knowledge to apply joint kinetics, 2) illustrate the use of joint kinetics in the evaluation of orthosis function in a variety of pathologies, 3) provide the skills necessary for using joint kinetics in orthosis decision-making and evaluation and 4) provide a biomechanical basis for how orthoses function.

Target audience: Orthotists, physical therapists, physicians, kinesiologists interested in the application of joint kinetics in orthosis decision-making and evaluation.

Course Summary: The course will review tools needed to interpret joint kinetic data and provide examples of how kinetic data provides the clinician with clinically relevant information in the evaluation of orthosis function.

The course will begin with an overview of the principles of joint kinetic calculations. Normal joint kinetic patterns will then be covered followed by an interactive exercise in identification of abnormal joint kinetic patterns. Kinetic goals in regards to brace function will be discussed. Finally, the impact of trunk positioning on lower extremity joint kinetics using patient examples will then be presented.

In the second half, the impact of bracing alternatives on joint function in terms of kinematics and kinetics will be discussed using case examples. In each case, impact of the orthoses (AFO's, KAFO's, UCBL's) will be determined by direct comparison to barefoot walking. Cases will be selected from a variety of pathologies including cerebral palsy, myelomeningocele and general orthopaedic issues.

22.) The Cognitive Benefits of Early Mobility: From Research to Practice

Rosanne Kermoian, PhD; *Ginny Paleg, MS, PT*

Course Level: All Levels

Target Audience: PTs, OTs, Physicians, Teachers, Families and all professionals currently working with infants and toddlers at risk or with developmental delays and/or gross motor dysfunction.

Purpose: To review the evidence on the effects of mobility on cognitive and brain development. To present protocols and aids to facilitate mobility in infants and young children.

Course Summary: Rosanne Kermoian will review the literature on how crawling, walking, and assistive mobility experience challenges the infant and young child, thereby facilitating cognitive and brain development. She will lead a discussion of the critical features of early mobility that capitalize on the power of neuroplasticity, such as the intensity of practice, and how they can be applied to mobility interventions to improve outcomes. Ginny Paleg will review the literature on body weight support gait therapy (BWSGT) and gait trainers. This course will bridge the gap between research and clinical applications through presentation of case studies, videos, and specific protocols.



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23.) After Injections with Botulinum Toxin A - What Happens Now? Specific After-Care to Improve the Effect of BTX-A Injections in the Lower Limbs for Children with Cerebral Palsy

Anja Van Campenbout, MD; Henry G. Chambers, MD;
Kerr H. Graba; Guy Molenaers, PhD, MD; Kaat Desloovere, PhD

Course Level: Intermediate

Purpose: The purpose of this course is to provide the audience with an overview of the optimal after-care for Botulinum Toxin A (BTX-A) injections for children with cerebral palsy (CP), and to highlight crucial success factors to improve the functional effect of the injections.

Target audience: The course will be relevant to orthopaedic surgeons, (neuro) paediatricians, physicians, kinesiologists, physical therapists and other health care providers involved in the multidisciplinary treatment of children with CP.

Course Summary: An in depth discussion of crucial factors that determine the outcome success will be preceded by an introduction to the use of BTX-A and by guidelines for different target groups, with specific goal-settings. The contribution of each crucial factor in the after-care will be thoroughly explored and illustrated with objective data from clinical practice and specific clinical cases. The course will cover all aspects of appropriate post injection care, including serial casting, orthotic management, physiotherapy and outcome measurements. Special attention will be given to proper patient selection with individually defined goal-settings. Emphasis will be placed on physiotherapy aims and specific day- and night orthoses, to improve and prolong the effect of the injections in the lower limbs and on the longitudinal follow-up of BTX-A treatment. Interactive educational case presentations will be provided.

Saturday, September 16

3:30 PM - 5:30 PM

24.) Hip Displacement in Cerebral Palsy: What We Know, What We Don't Know and What We Would Like to Know

Kerr H. Graham, MD; Pam Thomason, MSc; Jason J. Howard, MD, FRCS

Course Level: Intermediate

Purpose: To provide a comprehensive overview of hip disease in children with cerebral palsy. This course will discuss latest data from a population based cohort study and through an interactive process, derive audience based surveillance and management guidelines. The evidence base for each segment will be fully discussed: what we know/ what we don't know/what we would like to know.

Target Audience: Physiotherapists, Pediatricians and Orthopedic Surgeons, involved in the assessment and management of children with cerebral palsy.

Course Summary: The purpose of this interactive workshop is to critically review the knowledge base in respect of spastic hip disease and to develop guidelines for hip surveillance and management for children with cerebral palsy. Hip surveillance is suggested as the best method for early detection, early intervention and prevention of late dislocation and painful degenerative joint disease. The first step to improved data collection would be agreed guidelines on the minimum data set for hip surveillance and radiological measurement of hip displacement. The limited evidence on prevention and management of established hip displacement will be discussed as a basis for future clinical trials. New information in respect of the incidence of hip displacement, risk factors and surgical outcomes from a large, population-based study will be summarised at the start of the workshop, to provide the starting point for a lively, interactive, group discussion.

25.) Evaluation and Treatment of Crouch Gait in Individuals with Cerebral Palsy

Jean L. Stout, MS; James R. Gage, MD; Tom F. Novacheck, MD;
Michael Schwartz, PhD

Course Level: Intermediate

Purpose: The specific etiology of crouch gait is poorly understood. Consequently, treatment outcomes have been poor. This course will discuss the mechanism of crouch gait in cerebral palsy and the principles that need to be employed to correct it.

Target Audience: Pediatric orthopaedists, physiatrists and physical therapists who encounter children with cerebral palsy and crouch gait in their clinical practice.



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Course Summary: This course will summarize Gillette Children's experience with crouch gait in cerebral palsy.

Abnormal forces during growth produce deformities including: 1) abnormal muscle growth and 2) lever-arm dysfunction (LAD). Adolescents with crouch gait typically present with LAD (usually a combination of femoral anteversion, external tibial torsion and pes valgus) plus abnormal muscle lengths (soleus, vasti, and gluteus maximus muscles are generally too long whereas gastrocnemius and hip flexors are too short). The relative lengths of hamstrings and rectus femoris are variable and depend on pelvic position.

If we study example cases, the elements of crouch gait become apparent: 1) It usually occurs during the adolescent growth spurt. 2) Precipitating factors include LAD and/or soleus weakening. 3) All cases of crouch demonstrate loss of the *plantarflexion / knee-extension couple*.

Based on an understanding of the pathology, we will illustrate treatment with appropriate case examples.

26.) Children with Cerebral Palsy and Learning Disabilities: Evaluation and Intervention

Sarah Winter, MD; Christine Clancy, PhD; Adine Usher, EdD

Course Level: Basic

Purpose: The course faculty wishes to expand the audience's understanding of the complexity of the issues in the classroom facing a child with cerebral palsy and a learning disability. The goal is to enhance each participant's ability to contribute to the child's success in the classroom.

Target Audience: therapists, nurses, physicians, psychologists, and educators

Course Summary: The course will consist of an overview of the expanded definition of cerebral palsy as a condition encompassing multiple associated conditions including problems in learning. The instructors will then review the components of a comprehensive neuropsychological evaluation and the special testing considerations for a child with cerebral palsy. We will also discuss the important differences that exist between a psychoeducational evaluation and a neuropsychological evaluation. An explanation of how the results of a neuropsychological evaluation are used to generate specific recommendations for clinical management and educational planning, including Individualized Education Plans (IEPs). Finally, the course will apply this knowledge in the classroom setting. The course participants will learn five components an educator must keep in mind while creating a successful educational environment for the student with cerebral palsy. Emphasis will be made on neither overestimating nor underestimating a child's abilities. The course will finish with an example case discus-

sion in which the audience can apply what's been learned to a specific child and classroom setting.

27.) Operative Management of the Upper Extremity in Cerebral Palsy

Louis Andrew Koman, MD; Michelle Gewin Carlton, MD; Jennifer Lewin, OT

Course Level: Intermediate and Advanced

Purpose: To introduce the principles of diagnosis and operative management of the clinical manifestations of spasticity affecting the upper extremity in pediatric patients with cerebral palsy. The course will include discussions of non-operative and operative options and the rationale for their use.

Target Audience: Health care professionals who treat cerebral palsy patients.

Course Summary: This course will provide an overview of the diagnosis and management of spasticity of the upper extremity in pediatric cerebral palsy patients. Discussions will include the use of standardized history and physical examination techniques to identify treatment options. Operative options for the management of specific deformities of the upper extremity (shoulder, elbow, forearm, wrist, hand, and digits) will be discussed using a case presentation format. Rehabilitation options and specific therapeutic protocols also will be discussed. In addition, the role of validated functional, health-related quality of life, and utility instruments in the outcome assessment of the treatment options will be reviewed.

28.) ITB Case Presentations – Patient Selection and Outcomes

Elizabeth A. Moberg-Wolff, MD; Laura Wilner, MD; Jane Emerson, MD

Level: Intermediate

Purpose: Issues impacting optimal patient selection for ITB ((Intrathecal Baclofen) therapy among ambulatory and non-ambulatory patients will be discussed. How to evaluate these issues so best functional outcome is achieved will also be a focus of the cases presented.

Target Audience: Psychiatrists, Neurologists, Orthopedic Surgeons, Pediatricians, Neurosurgeons, Physical and Occupational Therapists

Course Summary: This course will emphasize appropriate patient selection for intrathecal baclofen therapy among children with cerebral palsy, especially those that have functional mobility goals. An overview of spasticity treatments will be included, with emphasis on ways to optimally predict a child's potential functional outcome from these interventions. Issues specific to the ambulatory child including dosing patterns and post-implant precautions will be discussed.



Abstracts

29.) Sexuality and People with Physical Disability

Ronna Sue Linroth, MA

Course Level: Basic

Purpose: To provide information on sexuality and people with childhood onset disability such as Cerebral Palsy, Spina Bifida, and Spinal Cord Injury.

Target Audience: Content is relevant to health professionals, service providers, caregivers, and adults with disability who are interested in educating patients about sexuality for adolescents and adults with disability.

Course Summary: This course will present information on influencing dysfunction in people with specific diagnoses, review basic anatomy and physiology, treatment options, cautions, assistive technology, and resources. To paraphrase Sue Johanson, author and television host of *Talk Sex with Sue*, "Sexuality is perfectly normal but not normally perfect." The presentation discusses sexual health facts and treatment options necessary to equip adolescent and adult patients.

30.) Where Do We Go From Here? New diagnosis of a Developmental Disability: How to Support Families - Literature Resources for Families and Children

Christine M. Houliban, MD

Course Level: Basic and Intermediate

Purpose: To discuss ways to support families in the diagnosis of a developmental disability. To review available literature (articles, handouts, and books for families, children and school) to help families understand and gain knowledge about their child's diagnosis.

Target Audience: Health professionals and paraprofessionals who play a role in the diagnosis and support of families with developmental disabilities. This course will be relevant to pediatricians, physical therapists, occupational therapists, speech therapists, educators, psychologists, administrators, and others.

Course Summary: This course will start with an initial discussion of the challenges that health care professionals face when giving the diagnosis of a developmental disabilities. We will then discuss what role we can play in helping families with the diagnosis and navigate the information that they may find including ways to evaluate the evidence of treatment options, understanding the internet, and becoming an advocate for their child. The course will then focus on what literature resources are given to the family at the time of diagnosis in a developmental pediatrics clinic, as well as what resources exist in ones community. The course will end with a discussion of how to best explain the diagnosis to the child, siblings and classmates focusing on children's literature available for different age groups.

31.) Evaluation, Diagnosis and Treatment of Feeding Disorders in Children with Developmental Disabilities

Jo-Ann B. Bier, MD; Jennifer Miller, MS, CCC-SLP; Gloria Chiang, PhD

Course Level: Basic

Purpose: We will present a multidisciplinary approach to the evaluation and treatment of feeding problems in children with developmental disabilities including cerebral palsy, a history of prematurity, multiple congenital anomalies, and children with tracheostomies and G-tubes. Assessment tools, including direct observation and videofluoroscopic swallow study, and treatment approaches, including sensory-motor and behavioral feeding techniques, will be reviewed

Target Audience: Primary Care and Developmental Pediatricians, Speech Pathologists, Occupational Therapists, Physical Therapists

Course Summary: We will begin with a discussion of the types of feeding difficulties that occur frequently in children with developmental disabilities, including poor weight gain, restriction in the type or amount of foods accepted, oral-motor dysfunction, oral aversion, G-tube dependence, intolerance of textured foods, prolonged feeding times, feeding refusal, and resistance to sitting for mealtimes. A review of the assessment of oral-motor and oral-sensory feeding issues, developmental feeding skills, and the clinical evaluation of swallow function will then be presented. Assessment skills including a review of the phases of swallowing and subsequent determination of a safe oral feeding plan based on the results of the videofluoroscopic swallow study will be presented. Finally, we will review techniques used in behaviorally-based feeding programs, focusing on identifying the causes of problematic feeding behaviors and then developing strategies by manipulating the identified antecedents and consequences of the behaviors in order to improve feeding skills.

