IC 26: APPLIED BEHAVIOR ANALYSIS AND EATING PROBLEMS: TREATMENT OF FOOD REFUSAL AND GENERAL BEHAVIOR MANAGEMENT IN CHILDREN WITH NEURODEVELOPMENTAL DISABILITIES
Thomas Mulderink, PhD; Melissa Gonzalez, Ph.D., BCBA.D

Purpose: This course will present evidence-based information regarding interdisciplinary evaluation and intervention for addressing problem behaviors in children with neurodevelopmental disabilities, with special focus on addressing mealtime problem behaviors. A review of literature specifically focusing on interventions targeting common behavioral concerns will be reviewed. This workshop will focus on assisting attendees to identify common purposes or functions of behavior and effective general strategies that may decrease the likelihood of behavioral difficulties across settings, and strategies specific to mealtime difficulties.

Target Audience: Developmental Pediatricians, Physical Therapists, Occupational Therapists, Speech Language Pathologists, physiatrists, psychologists, and neurologists

Course Summary: Children often present with problem behaviors when asked to perform a difficult or aversive task. Mealtimes often present numerous challenges to children with neurodevelopmental disabilities. Children presenting with cerebral palsy, autism spectrum disorders and other neurodevelopmental disabilities may develop problems such as food selectivity, food refusal, and maladaptive patterns of eating. There are several effective behavioral interventions available to address behavioral concerns and develop functionally appropriate skills. The Pediatric Feeding Disorders Program at Kennedy Krieger Institute employs an interdisciplinary approach to address these issues. Attendees to this course will learn about several reasons why problem behaviors are developed and maintained, and identify triggers and consequences for problem behaviors. Several effective data-based intervention strategies to address feeding-related problem behaviors will be reviewed and discussed.

Learning Objective 1: Identify the four major functions of behavior.
Learning Objective 2: Examine current evidence-based research related to intervention for mealtime problem behaviors
Learning Objective 3: Discuss the development of effective, data-based intervention strategies to manage problem behaviors
Learning Objective 4: Understand common antecedents and consequences of behavioral problems, specifically focused on mealtime behaviors
IC 27: ASSESSING GAIT IN CHILDREN WITH CEREBRAL PALSY: WHAT TO DO WHEN YOU CAN’T USE A GAIT LAB
Susan Rethlefsen, DPT; Robert Kay, MD

Purpose: To outline effective ways to evaluate gait and plan treatment interventions when gait analysis laboratory data are not available.

Target Audience: Physicians, orthopedic surgeons, physical therapists

Course Summary: Current best practice includes use of comprehensive gait analysis data when planning orthopedic surgical intervention to improve gait for children with CP. However, gait analysis laboratories are not available in some settings, and surgical intervention must sometimes be done without benefit of computerized gait data. Using lessons learned from over 20 years of gait analysis data interpretation, as well as evidence from the literature, faculty will describe methods for systematically evaluating gait problems using physical examination, radiographs and videotaping. Discussion will include ways to avoid common adverse outcomes associated with surgery based on observational assessment alone. Skills will be practiced using case examples, and attendee participation will be encouraged.

Learning Objective 1: Understand the natural history of gait and motor function in patients with CP
Learning Objective 2: Describe common errors in identification of gait problems associated with visual assessment, and how to avoid them
Learning Objective 3: Identify methods for objectively assessing gait without a lab
Learning Objective 4: Practice implementing these methods using case examples
IC 28: CONSIDERATIONS IN CARING FOR CHILDREN WHO ARE DEAF OR HARD OF HEARING
Laurie Glader, MD; Amy Szarkowski, PhD; Susan Mumby Gibbons, Doctoral Degree in Audiology, Master's Degree in Speech-Language Pathology

**Purpose:** Children with medical complexity often have hearing loss. However, many practitioners who care for this population never receive specialized training regarding the potentially significant implications or management of hearing loss, nor how to incorporate surveillance into practice. This workshop will address the unique needs of this population, provide information about hearing technologies and supports, including cochlear implants, and address the ramifications of being deaf or hard of hearing on daily functioning, academic achievement, cognitive abilities, and family quality of life. Practical tips for supporting children with hearing loss in practice will be reviewed. There will be ample time for audience engagement and discussion.

**Target Audience:** This workshop is intended for all providers who work with children who have hearing loss. It is intended to be applicable for a broad multi-disciplinary audience.

**Course Summary:** This course will address a range of issues related to hearing loss in childhood, particularly as it pertains to children with complex medical needs. Implications of reduced hearing on speech, language and communication abilities will be reviewed. Access to language will be defined. Hearing technologies (e.g., hearing aids, cochlear implants, FM systems), including their potential benefits and limitations will also be explored. Discussion will include developmental considerations, such as the implications of language deprivation and the impact of hearing loss on academic achievement, cognition and quality of life. Attendees will participate in a simulated demonstration of moderate hearing loss which will help to convey the experience of hearing loss. Practical methods for professionals to ‘ask the right questions’ and more effectively support children who are deaf or hard of hearing and their families will be shared.

**Learning Objective 1:** Describe at least two implications of delayed access to language
**Learning Objective 2:** Identify two differences between hearing aids and cochlear implants
**Learning Objective 3:** List at least three questions to ask families of children who are deaf or hard of hearing regarding their use of hearing technologies
**Learning Objective 4:** Articulate a minimum of two ways that reduced hearing presents additional challenges when working with children with complex medical needs and their families
IC 29: CONSTRAINT-INDUCED MOVEMENT THERAPY (CIMT): A NEW ERA OF COMPARATIVE EFFECTIVENESS RESEARCH AND DOCUMENTING FIDELITY OF TREATMENT
Sharon Ramey, Ph.D.; Richard Stevenson, MD; Stephanie DeLuca, Ph.D.; Amy Darragh, OTR/L, PhD, FAOTA

Purpose: This course will present major design options for comparative effectiveness research in pediatric neurorehabilitation. Central to a new era of research on different evidence-based treatments will be measuring Fidelity of Treatment. The course will focus on innovations in design and measurement and present guidelines for using study results to inform clinical practice.

Target Audience: The target audience includes clinicians and scientists interested in comparative effectiveness research and treatment fidelity.

Course Summary: This course will describe the design and methods used in ongoing NIH multisite trials to compare effects of different forms of CIMT (varying in dosage and type of constraint) and Bimanual Therapy for infants and older children. These trials have produced a new tool to measure Fidelity of Treatment. Using video clips, participants will learn how to use this in research, training, and clinical practice. Ideally, comparative effectiveness research will expand measurements (beyond traditional focused therapy outcomes) to include stressors, "spillover" to other domains of behavior and brain development, and costs. Workshop attendees will participate in discussing how to stimulate high-priority comparative effectiveness research and develop ways to effectively disseminate results to promote high levels of implementing “best practice protocols.” (This course builds on feedback from the Treatment Fidelity breakfast session in 2015 and includes new data and extra discussion time.)

Learning Objective 1: Understand the advantages and limits of alternative designs for conducting comparative effectiveness research. Included will be prospective randomized controlled trials and strategic analyses of clinical databases
Learning Objective 2: Learn how to apply a recently developed reliable and valid tool to measure treatment fidelity (protocol adherence) for CIMT and other interventions
Learning Objective 3: Identify and be able to monitor factors likely to influence decision making and implementation of CIMT and other treatment protocols, based on comparative effectiveness findings
Learning Objective 4: Discuss comparative effectiveness research and treatment fidelity with parents and clinicians
IC 30: DETERMINING UPPER EXTREMITY INTERVENTIONS FOR CHILDREN WITH CEREBRAL PALSY: USE OF THE SHRINERS HOSPITAL UPPER EXTREMITY EVALUATION
Lisa Wagner, DHS, OTR/L; Jon Davids, MD; Laura Peace, OTR/L

**Purpose:** To educate clinicians in an interactive format on the use of a reliable, validated and scored video based outcome measure that allows families and clinicians to trend and document progress pre and post orthotic, therapeutic and surgical intervention.

**Target Audience:** Clinicians interested and/or involved in decision making for upper extremity surgical intervention, trending upper extremity function, or documenting outcome for therapeutic or surgical intervention of the upper extremity for children with all cerebral palsy types.

**Course Summary:** This course will provide an overview of the rationale and development of the Shriners Hospital Upper Extremity Evaluation (SHUEE). In addition to being beneficial for clinicians in determining interventions, family members and patients are pleased to view their pre and post intervention videos. Videos are used as an educational tool to show families other children's' outcomes to allow them to be an integral part of the interdisciplinary team for intervention decision making purposes. The test takes 15 minutes to administer. The first page evaluates the patient through standard measurements of range of motion, tone, and history-based assessment of activities of daily living. The second page evaluates spontaneous use of the involved extremity and the segmental alignment of the extremity while performing a series of tasks on demand. Participants will interact to learn how to perform, score and interpret the SHUEE. Illustrative cases will include children pre/post botulinum toxin and pre/post-surgery. Surgical outcome and recommendations will be reviewed. Implementation of the SHUEE as an outcome research tool and educational tool for families will be described.

**Learning Objective 1:** Conduct a test that will enhance interdisciplinary communication between physician, therapist and parents for making intervention recommendations

**Learning Objective 2:** Describe the development and indications for the SHUEE

**Learning Objective 3:** Demonstrate the scoring and interpretation of the SHUEE

**Learning Objective 4:** Define the role of the SHUEE in outcome-based clinical decision making, measuring pre and post intervention and providing an educational tool for families
IC 31: LOCAL/GLOBAL ADAPTIVE DESIGN FORUM
Nienke Dosa, MD, MPH; Shruti More, OTR; Jonathan Greenwood, PT, MS, PCS, c/NDT, DPT; James Fathers, PHD; Lisa Neville, M.S. O.T.R./L.

**Purpose:** To describe how “adaptive design” empowers families and activates communities. To give example of adaptive design solutions from around the world. To orient participants to liability, vetting, information sharing/crowd-sourcing, public policy, and community health implications of the adaptive design approach.

**Target Audience:** Occupational therapists, physical therapists, orthotists, people with disabilities, caregivers, pediatricians, and anyone interested in adaptive design. We hope to include as many international perspectives as possible.

**Course Summary:** “Adaptive Design” empowers carers-families and the client in the design and making process by using low cost materials for custom-made design solutions. In the United States the adaptive design paradigm is increasingly being used to develop assistive technology for recreation and social participation. This is because insurance companies do not consider manufactured products that meet these needs as “medically necessary”. In developing countries and/or remote rural areas low cost adaptive designs are the only options available for assistive technology. Some brilliant problem solving is being done in situations like these all over the world. This instructional course will provide a forum for members to share design solutions from their local communities. We will also orient participants to liability, vetting, information sharing/crowd-sourcing, public policy, and community health implications of the “Adaptive Design” approach.

**Learning Objective 1:** Describe how “adaptive design” empowers families and activates communities and list several low cost adaptive design initiatives that have a global reach

**Learning Objective 2:** Discuss issues related to liability and vetting of adaptive designs

**Learning Objective 3:** Define information sharing and crowd-sourcing models that promote design innovation

**Learning Objective 4:** Discuss public policy and community health implications of the “Adaptive Design” approach
IC 32: ORTHOPEDIC SURGERY FOR ADULTS WITH CEREBRAL PALSY
M. Wade Shrader, MD; Hank Chambers, MD; Garey Noritz, MD; Kevin Murphy, MD

**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. The impact of these surgical procedures on the patient and their family will be discussed within the context of the International Classification of Functioning, Disability and Health (ICF). 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:** Understand some details of orthopedic surgical procedures that are performed on adults with cerebral palsy

**Learning Objective 2:** 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 complications

**Learning Objective 3:** Learn about how postoperative care and rehabilitation differs for adults with CP undergoing orthopedic surgery

**Learning Objective 4:** Discuss pros/cons about location of adult care (children's versus adult hospital), and who should provide orthopedic surgical care to adults with CP (pediatric orthopedic surgeons versus adult orthopedic specialists)
IC 33: SURVEILLANCE AND MANAGEMENT OF HIP DISPLACEMENT IN CEREBRAL PALSY

Pamela Thomason, MPT; Kate Willoughby, DPT, PT; Abhay Khot, MD; Vedant Kulkarni, MD

Purpose: This updated course will focus on the practical application of evidence for the surveillance and management of hip displacement in children with cerebral palsy (CP). It will help participants to navigate evidence-based management options in relation to complex and potentially competing needs of the child and family.

Target Audience: Physical therapists, paediatricians, orthopaedic surgeons, rehabilitation physicians

Course Summary: This course will provide an overview and practical approach to the surveillance and management of hip displacement in CP. The epidemiology of hip displacement will be explored, including new evidence of the influence of pelvic obliquity and correlations between hip morphology and pain in adolescents and young adults. Strategies for implementing effective hip surveillance will be described based on the findings of studies that engaged with both parents and health professionals to explore potential barriers to the hip surveillance process. For the first time, a newly developed smart phones app will be featured and presented as a strategy to support hip surveillance.

The difficulties of developing and implementing management algorithms will also be explored. The workshop will highlight new evidence of outcomes of both soft-tissue and bony reconstructive surgery, and the relationship with GMFCS. Evidence of the effectiveness of non-surgical approaches to hip displacement will be also explored. A copy of the Australian Hip Surveillance Guidelines for Children with Cerebral Palsy will be available to all participants and there will be ample time to discuss the revisions and their implications. 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. These 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: Describe the epidemiology of hip displacement and its relation to gross motor function

Learning Objective 2: Describe potential barriers to hip surveillance and strategies to overcome such barriers, including app technology

Learning Objective 3: Evaluate the evidence for long-term outcomes of surgical and non-surgical interventions for hip displacement and explain this evidence to parents and carers

Learning Objective 4: Understand the rationale and timing of various forms of surgical intervention in relation to the severity of the motor disorder
IC 34: SWIMMING UPSTREAM – A MODEL FOR (EVENTUAL) SUCCESS IN INTERDISCIPLINARY CEREBRAL PALSY CARE
Jilda Vargus-Adams, FAAP, FAAPM&R, MD, MSc; Hillary Prather, MSW; Caroline Colvin, DPT; Jennifer LeCompte-Phelps, RN

**Purpose:** This course will present the history, current model, and ongoing quality improvement efforts in an interdisciplinary cerebral palsy clinic. Specific evidence-based recommendations for patient care and strategies for integrating best practice and family centered care in an interdisciplinary clinic will be reviewed. This course will help attendees develop or improve an interdisciplinary clinic in their home practice settings.

**Target Audience:** Physicians, therapists, nurses, social workers, clinic administrators

**Course Summary:** This course will review the development and evolution of an interdisciplinary cerebral palsy clinic at Cincinnati Children’s Hospital Medical Center. We will share the trajectory of the clinic’s formation and growth as well as many details of the clinic team, the processes for communication and patient management, the role of the electronic medical record, and quality improvement efforts. We will discuss evidence based care in a clinic setting and report key components that fuel our progress. Presenters will provide a ground map for starting or refining an interdisciplinary clinic and brainstorm with attendees for individual solutions.

**Learning Objective 1:** Describe efficient processes for provision of interdisciplinary care in a CP clinic

**Learning Objective 2:** Implement and evaluate at least one example of best practice care in a CP clinic

**Learning Objective 3:** Design a collaborative interdisciplinary CP team clinic that could work in their local practice setting

**Learning Objective 4:** Advise colleagues on strategies to improve collaboration in existing practice patterns
IC 35: THE ALPHABET OF ADVANCED HYPERTONIA MANAGEMENT: BTX, DBS, ITB, SDR
Warren Marks, MD; Eric Levey, MD

Purpose: To present a framework for understanding the application of various, primarily neurosurgical, options for the management of medically refractory spasticity and dystonia.

Target Audience: Physicians, therapists, nurses, family members and other interested involved the treatment of or affected by spasticity and/or dystonia.

Course Summary: This course is designed to give participants an understanding of the options available for the management of advanced hypertonia, including both spasticity and dystonia. It begins with the basics of treatment with standard medications, and will then proceed to a discussion about intrathecal baclofen, deep brain stimulation, and deep brain stimulation. A treatment paradigm will be presented.

Learning Objective 1: Recognize and distinguish spasticity and dystonia.
Learning Objective 2: Understand how certain medication work to alter spasticity and dystonia and appreciate the potential for side effects.
Learning Objective 3: Utilize a treatment paradigm to recognize when advanced management techniques including BTX, ITB, SDR and DBS in patients with dystonia and spasticity when medications are inadequate.
Learning Objective 4: Appreciate the importance of managing expectations of patients and families through education.
IC 36: THE ROLE OF NEUROIMAGING IN THE WORK-UP OF CHILDREN WITH DYSKINETIC CEREBRAL PALSY
Andrea Poretti, MD; Alec Hoon, MD, MPH; Avner Meoded, MD

Purpose: To provide an in depth understanding of the role of neuroimaging, particularly magnetic resonance imaging (MRI) in the work-up of children with dyskinetic cerebral palsy (CP). Without putting attendees on the spot, we will encourage active audience participation in image interpretation.

Target Audience: Clinicians and other health-care providers involved in the diagnostic evaluation of children with dyskinetic cerebral palsy

Course Summary: Dyskinetic CP accounts for around 10% of CP cases and is associated to lesions of the basal ganglia and thalami. Neuroimaging plays a key role in the diagnostic work-up of children. A high-number of neurometabolic/genetic diseases may mimic dyskinetic CP. Some of the mimickers of dyskinetic CP are treatable diseases; hence, an early differentiation between them and causes of dyskinetic CP is paramount. This course will give first a short overview about the anatomical background of brain regions involved in dyskinetic CP. The second part of the course will summarize the key principle of conventional and advanced neuroimaging techniques that are important in the work-up of children with dyskinetic CP. The main part of the course will discuss neuroimaging findings of causes of dyskinetic CP and its mimickers based on cases from our clinical work. These cases should highlights key neuroimaging findings of children with dyskinetic CP as well as red flags that suggest potentially treatable mimickers.

Learning Objective 1: Identify the key conventional and advanced neuroimaging techniques for the diagnostic work-up of children with dyskinetic CP
Learning Objective 2: Recognize the typical neuroimaging findings of children with dyskinetic CP
Learning Objective 3: Recognize red-flags neuroimaging findings that should suggest potentially treatable mimickers of dyskinetic CP
Learning Objective 4: Identify typical neuroimaging findings of mimickers of dyskinetic CP
IC 37: TROUBLE SHOOTING AND MANAGING INTRATHecal BACLOFEN THERAPY
Freeman Miller, MD; Julieanne Sees, DO; Maura McManus, MD

Purpose: The goal of this course is to provide clinical guidelines for addressing problems encountered with intrathecal baclofen therapy (ITB). When and how to address poor response to ITB, medical complications, and how to work up possible catheter malfunctions. Multiple case examples will be used to illustrate the issues discussed.

Target Audience: Physicians, nurses, physician assistants

Course Summary: The course will be divided into discussion of medical problems, loss of effectiveness, over dose management, work-up of the mechanical system of the pump and catheter, treatment options, and diagnosis, work-up and treatment of infections. The course will cover the common complications such as constipation and urinary retention. The protocol to address poor or non-response to ITB will include a series of planned dose adjustments such as a bolus dose and the use of complex programming. Parameters for more invasive catheter and pump work up will be presented. The methods for these work ups using CT scan will be outline with multiple examples of expected findings. Treatment options for each of the finding will be presented. Patients who present with possible infections will be discussed with a work up algorithm, as well as treatment options and outcome expectations for pump pocket and catheter infections.

Learning Objective 1: Understand the expected complications related to ITB including the initial treatment response.
Learning Objective 2: Understand the role and method for using CT scan to work up suspected catheter malfunction.
Learning Objective 3: Be aware of the risk of ITB infections, presentations and treatment options
Learning Objective 4: Develop an over all understanding of the problems related to ITB management.