

BREAKFAST SEMINAR

Title: An Outcome that matters: Effective Mobility

Purpose:

Describe effective mobility, its history, the evidence about why and when it is critical to people with cerebral palsy and other motor impairments, and how to accomplish it.

Target Audience: Physicians, Therapists, Educators

Course Summary:

Clinical practices previously favored normalization of movement. Current practice emphasizes the facilitation of functional activities and full participation in society across the life span.

Effective, independent mobility is instrumental for independence and participation and is a key skill that induces or accelerates skills in other developmental domains. Assistive devices make this possible for even very young and severely involved children. Using alternate means of mobility than walking is supported by dynamic systems theory, which posits that effective motor solutions result from the interaction of factors in the child, task and environment. Drs. Butler and Darrah will discuss with participants the issues and problems of providing assistive technologies to enable people to achieve optimal functional mobility.

Learning Objective 1: To understand areas of advanced knowledge that led to a paradigm shift to effective mobility.

Learning Objective 2: To understand why effective mobility and its timing is crucial to optimizing development, function and participation.

Learning Objective 3: To understand evidence for early powered mobility.

Learning Objective 4: To understand augmentative mobility systems.

Course Format (include Speaker Topics, Break time, and Q&A time)

5 Minutes: Introduction Film "Life Brought to You by Mobility"

15 Minutes: Effective mobility (what and why)

Presenter: Name, credentials, professional title

Effective mobility: definition and paradigm shift

Effective mobility: causes of paradigm shift from traditional focus on (outcomes of traditional approach; outcomes of restricted movement on child development; changes in theory of motor development and model of disability; input from disability movement)

15 Minutes: Effective mobility (when and how)

Presenter: Name, credentials, professional title

Effective mobility: timing (advances in knowledge in child development; importance of locomotion; body and mind neuroscience; research with powered wheelchair toddlers)
Effective mobility: how? (increasing availability of assistive technologies to bypass physical limitations and assist human function; augmentative mobility systems)

20 Minutes: Q&A

Issues and problems of providing assistive technologies to enable people to achieve optimal functional mobility, how this knowledge may cause participants to re-examine their own paradigm about effective mobility, and cases the participants may present.

INSTRUCTIONAL COURSE

Title: Botulinum Toxin A (BTA): Evidence Based Clinical Practice Guidelines

Purpose: This course will present “Evidence-informed Clinical Practice Guidelines” for the assessment and treatment of paediatric lower limb spasticity, upper limb hypertonicity, and saliva control with Botulinum Toxin A. This workshop will help attendees integrate evidence on BTA use into their clinical practice.

Target Audience: Physicians, Occupational and Physiotherapists, Speech and Language Therapists, Nurses

Course Summary: This course will present the results of the International Consensus Panel evaluating the evidence for the use of BTA in three paediatric conditions: lower extremity spasticity, upper extremity hypertonia and drooling. Literature was searched and the highest levels of evidence available were used to develop recommendations, with randomised controlled trials (RCTs) and systematic reviews preferentially sought. The international panel consisted of researchers and clinicians and was multidisciplinary. Workshop attendees will participate in case discussions where treatment plans will be developed using the algorithms. A focus of the workshop will include a discussion of safety when using BTA in children with GMFCS IV,V and evolving information on the impact of BTA at a “muscle” level.

Learning Objective 1: To understand the levels of evidence for the use of BTA in pediatric limb hypertonicity and saliva control.

Learning Objective 2: To develop skill in using the evidence informed clinical algorithms to make clinical decisions when using BTA.

Learning Objective 3: To discuss safety issues of BTA as it relates to children with GMFCS IV, V and the impact of repeated BTA injections at a “muscle” level.

Learning Objective 4: See above.

Course Format (include Speaker Topics, Break time, and Q&A time):

Speaker 1: Name (20 minutes):

Overview of course objectives, review of Lower Limb BTA Guideline and Algorithm.

Discussion of BTA use in children with GMFCS IV, V.

Speaker 2: Name (10 minutes): Review of the Saliva Management Guideline

Speaker 3: Name (20 minutes): Review of the Upper Limb BTA Guideline and Algorithm.

Discussion of evolving evidence of the impact of BTA on growing muscle.

Case Presentations with workshop attendee participation in developing a management plan using the clinical algorithm.

Open Discussion: audience and panel speakers to allow ample time for questions and debate

SCIENTIFIC PRESENTATION

Title: Comparing Ultrasound-guided Anterior and Poster Approaches for Needle Insertion in the Tibialis Posterior in Children with Hemiplegic Cerebral Palsy.

Background/Objectives: To reduce the spasticity and to correct equinovarus deformity, the tibialis posterior is frequently targeted for botulinum toxin injection in children with spastic cerebral palsy (CP). Although needle insertion into the tibialis posterior is usually performed with the guidance of anatomical landmarks, the tibialis posterior is considered to be the least accessible muscle for needle placement because it is located deep within the lower leg. We aimed to investigate the ultrasonographic anatomy of the lower leg in children with hemiplegic CP for safe and accurate needle placement into the tibialis posterior using the anterior and posterior approach.

Design: Cross-sectional study.

Participants and Setting: A total of 18 children with hemiplegic spastic CP (age ranged 2y 6m-5y 11m, 12 boys, 6 girls) were recruited in university rehabilitation hospital.

Materials/Methods: The children were placed in a supine position on the examination bed with their legs in a slight internal rotation for anterior approach and in a external rotation for posterior approach. We performed a B-mode, real-time ultrasonography using a 5 to 12-MHz linear array transducer. During anterior and posterior approaches, the safety window (the tibia to the neurovascular bundle) and the depth to the midpoint of the safety window (skin to the tibialis posterior) at the upper third and the midpoint of the tibia were measured with a transverse ultrasonographic scan.

Results: The mean \pm SD of height, body weight, and length of the tibia were 98.44 \pm 6.20cm (92-113cm), 15.31 \pm 2.67kg(9-20kg), and 18.97 \pm 1.08cm (15-24cm), respectively. In anterior approach, the safety window at the upper third of the tibia (0.64 \pm 0.09cm, ranged from 0.49cm to 0.82cm) was significantly larger than that at the

midpoint ($0.36\pm 0.08\text{cm}$, ranged from 0.22cm to 0.48cm , $P<0.01$). In posterior approach, contrarily, the safety window at the mid point ($0.75\pm 0.19\text{cm}$, ranged from 0.45cm to 1.18cm) was significantly larger than that at the upper third of the tibia ($0.48\pm 0.21\text{cm}$, ranged from 0.22cm to 0.97cm $P<0.01$). At the upper third of the tibia, the safety window was larger in anterior approach than in posterior approach ($P<0.01$). At the midpoint, contrarily, the safety window was larger in posterior approach than in anterior approach ($P<0.01$) The depth to the tibialis posterior ranged from 1.25cm to 2.69cm at the upper third of the tibia and ranged from 0.99cm to 2.57cm at the midpoint.

Conclusions/Significance: Ultrasonographic guidance is a useful tool for needle insertion into the tibialis posterior with safety and accuracy. Considering the safety window, we suggest the needle placement at the upper third point of tibia in anterior approach and at the midpoint in posterior approach.

DEMONSTRATION POSTER

Title: Thermoplastic Total Body Splint as an Alternative to Post-Operative Spica Casting

Background/Objectives: To describe the indications for using a thermoplastic total body splint (TBS) as an alternative to traditional spica cast immobilization. To describe the technique for making the TBS in a reproducible step-by-step manner.

Description: Because of the known complications associated with the use of post-operative spica cast immobilization such as skin breakdown and post-operative fracture, we sought to develop an alternative means of immobilization. The TBS consists of a thermoplastic anterior shell extending from the chest to the ankles with Velcro straps around the posterior aspect of the patient's body. The orthotic department at our institution has developed a technique for making a TBS in the operating room setting at the conclusion of surgery. This is done utilizing a large thermoplastic sheet placed in a hot water bath. The malleable sheet is then molded to the patient's body which is held in the position preferred by the surgeon (Figure 1). The orthotics team then immediately trims the thermoplastic sheet into the final brace, applies padding to the edges, and affixes Velcro straps around the posterior aspect (Figure 2). The TBS is placed on the patient prior to the patient awakening from anesthesia. The entire process takes less than ten minutes. For the past 10 years the TBS has been used in a variety of surgical procedures including osteotomies of the femur and pelvis and single event multi-level surgery in cerebral palsy and spina bifida. The only instance in which we do not use the TBS is when an open reduction and capsular plication of the hip joint has been performed. The TBS is removable and allows easier perineal care of the patient. The TBS also allows for early range of motion. Pressure sores rarely occur as the splint can be removed on a regular basis to inspect the skin.

Significance: The total body splint is a reliable alternative to the spica cast. The technique is simple and easily reproducible. It has been accepted well by parents. The TBS as an alternative to spica casting allows earlier active and passive range of motion and may decrease the incidence of post-operative fractures, skin breakdown, and other complications associated with spica casting. Further research would be useful to better define these out.