

## New Rehab Strategies: Orthoses, Taping, and TheraTogs for Children with CNS Dysfunction · 4-Day Program

### Course Description

[Download Description \(PDF\)](#)

With an emphasis on the foot and ankle - the body-ground interface - Ms. Cusick briefly reviews numerous anatomical, physiologic, and functional factors that commonly operate in individuals with movement disorders related to central nervous system dysfunction. She organizes this complex body of information into key components of evaluation and management, as she reviews several new concepts that have emerged from research in the fields of foot and ankle biomechanics, kinetics in gait, muscle physiology and pathophysiology, pathokinesiology, foot and gait development, motor learning, and clinical rehabilitation.

The latter field of discussion features several new tools and strategies, including weight-line training, functional strengthening, orthotic posting principles and orthotic selection, Elaine Owen's AFO-Footwear Combination principles, the R-Wrap© Orthosis, serial casting using the Flexcast© Preparatory AFO, TheraTogs™ orthotic undergarment and strapping systems, and patella alta taping.

Videotaped case presentations featuring children with neuromotor dysfunction demonstrate the process of using musculoskeletal data, postural assessment, and observational gait analysis to design a prioritized management program that begins with the foot and ankle.

The course concludes with an afternoon lab session for a maximum of 36 enrollees per instructor. Lab activities include:

- Execute hip rotation ROM, the modified Ryder's Test, hamstring length test, the patella angle, the Thigh-Foot Angle, and passive ankle DFROM tests on each other.
- Don and wear TheraTogs garments and experience various strapping techniques. Enrollees who did not register in time to participate in this lab are welcome to audit.

### Course Objectives:

Participants completing this course will be able to:

- Identify 8 immature, normal, developmental features of spinal and lower extremity skeletal structure and joint alignment.
- Define torsion, version, antetorsion, anteversion, varus, valgus, adductus, inversion, eversion, pronation, supination, equinus, and calcaneus.
- Explain the clinical and functional relevance of the passive and active length-tension relationships - particularly R1 end range - in normal and pathokinesiological conditions.
- Distinguish between muscle dominance and strength, and discuss related strapping and taping implications.
- Distinguish between spasticity, tone, and extensibility, and apply the definitions to commonly used management modalities.

- Describe the pathophysiologic influence of excessive muscle recruitment on muscle, connective tissues, nerves, blood vessels, and skin.
- Discuss the relationship between muscle transformation, history of use, and strength.
- Suggest 5 neuromotor-re-education strategies that apply Sahrman's suggestions for addressing muscle imbalances.
- Describe the components of ideal ankle and foot function in gait, and in the context of the closed kinetic/kinematic chain of the lower limb and torso.
- List 5 characteristics of the normal foot in infancy, and describe the biomechanical and kinesiologic processes that promote optimum foot development and function.
- State the normal mean for daily steps taken by adults, and relate this fact to the processes of musculoskeletal adaptation at the foot and ankle, and to neurologic/cortical adaptation.
- List the 5 attributes and the 3 rockers of normal gait.
- Distinguish between kinetics and kinematics in gait.
- List the 3 primary "engines" of the normal gait cycle in descending order of magnitude.
- Describe the mechanism of the "swing limb torque generator", and relate it to gait kinetics and kinematics.
- Describe the relevance of loading the heels in standing and gait in terms of the role of the mechanoreceptors and the necessity to recruit the calf musculature for postural maintenance.
- Relate various orthotic and plantar posting designs to the 3 rockers and to the goals of achieving the 5 attributes of gait.
- Explain the characteristics of these 4 strategies for managing equinus due to soft-tissue hypoextensibility: (1) heel lifting; (2) weight-line training; (3) the R-Wrap© orthosis; (4) serial casting.
- Discuss the principles, pros, and cons of each of the 4 strategies listed above.
- Explain the concept of relative flexibility and apply it to the design of lower-extremity orthoses and casts, and to the design and sequencing of TheraTogs™ strapping systems.
- Discuss contraindications and precautions for applying external rotation forces at the hip joint in individuals over age 7 years.
- Use an organizational tool to sort the findings of a videotaped musculoskeletal, postural, and clinical gait assessment into orthopedic categories, and suggest problem-related management strategies, beginning at the foot and ankle.

Lab participants are expected to achieve novice skill level in the execution of 6 LE musculoskeletal assessment procedures: hip rotation ROM, the modified Ryder's Test, hamstring length test, the patella angle, the thigh-foot angle, and passive ankle DFROM; in donning TheraTogs™ garments and ankle motion assist systems; and in applying straps to TheraTogs garments address one postural or movement problem in each of the cardinal planes.

## Course Schedule:

### Day 1

8:00 Coffee and Registration

8:30 Welcome, and introductory remarks

### Developmental Lower Extremity Features

8:45 Skeletal Modeling Mechanisms

9:15 Skeletal Modeling Events at the Spine, Hip Joint, Femur, and Knee Joint.

10:30 Break

10:50 Skeletal Modeling Events at the Leg and Ankle

12:00 Lunch and Library Time

### **Requirements for Balanced Muscle Function**

1:00 Pathophysiology - Recruitment-Induced Muscle Transformation

2:00 Short Break

2:15 Fundamentals of Muscle Balance Theory as they Apply to the CNS-Impaired Population

3:15 Short Break

### **Obtaining Musculoskeletal Findings Proximal to the Ankle and Foot**

3:00 Overview of Selected Assessments in the Sagittal Plane: Hip ROM, Hamstring Muscle Length - Norms and Clinical Relevance of Findings

4:00 Assessing Patella Position - Norms and Clinical Relevance of Findings; Videotaped Demonstration of a Taping Application for Patella Alta

5:15 Discussion/Questions

5:30 Independent Study Time - Reference Library and Videotaped Cases, available as long as facility remains open.

### **Day 2**

7:30 Coffee and Library Time

### **Obtaining Musculoskeletal Findings Proximal to the Ankle and Foot (Continued)**

8:00 Overview of Selected Assessments in the Frontal Plane: Pelvis, Leg Lengths, Hip Joint - Norms and Clinical Relevance of Findings

9:00 Overview of Selected Assessments in the Transverse Plane: Pelvis, "Hip" (TCA) Rotation ROM - Norms and Clinical Relevance of Findings

9:30 Short break

9:50 Overview of Selected Assessments in the Transverse Plane: Modified Ryder's Test - Norms and Clinical Relevance of Findings

10:30 Overview of Selected Assessments in the Transverse Plane: Thigh/Foot Angle and Lateral Leg Rotation ROM - Norms and Clinical Relevance of Findings

### **Foot Function/ Assessment/ Pathomechanics**

11:15 Review of Foot Joint Motions in the Open and Closed Kinetic/Kinematic Chains

12:00 Lunch and Library Time - Optional "bag lunch" case presentation on DVD at 12:30

1:00 Review of Foot Joint Motions, continued

2:00 Short break

2:15 Review of Assessments of the Ankle and Foot - Ideals and Clinical Implications

3:30 Short Break

- 3:45 Foot Pathomechanics and Posting Principles - Implications for Orthotic Modifications and Below-Knee Serial Casting Interventions
- 5:00 Discussion/Questions
- 5:15 Independent Study Time - Reference Library and Videotaped Cases, available as long as facility remains open.

### Day 3

- 7:30 Coffee and Library Time
- 8:00 Normal Foot Development
- 9:00 Name That Foot Deformity! Common Deformities in Children with CNS Dysfunction
- 9:45 Long Break
- 10:15 Name That Foot Deformity! (Again)

#### Hypoextensibility and Spasticity Management

- 10:30 Muscle Balance Theory in, and Physiologic Rationale for Selected Nonsurgical Interventions, Including: Cryotherapy, Neurolytics, Weight-Line Training; Positioning, Serial Casting, Maintenance; Strengthening
- 12:00 Lunch - Optional "bag lunch" presentation on DVD at 12:30

#### Gait: Developmental and Ideal Features

- 1:00 Review of Ideal Gait Features Relative to Kinetics, the Three Rockers, and Attributes of Normal Gait
- 1:30 Developmental Features of Independent Walking
- 2:30 Short break

#### Foot and Ankle Orthotic Design Considerations from a Kinetics Point of View

- 2:45 Review of Orthotic Options Available - Pros and Cons
- 4:00 Break
- 4:15 Resume Orthotic Design Review
- 5:15 Discussion / Questions
- Tomorrow, participants bring or wear shorts (preferably biking shorts) and please do not use skin lotion on your legs*
- 5:30 Adjourn. Optional Independent Study - Reference Library and Videotaped Cases, available as long as facility remains open.

### Day 4

- 7:30 Coffee and library time
- 8:00 Review of up to 2 presentations, chosen by majority vote
- 9:30 Short break

#### Putting It All Together

- 9:45 Bringing Clinical Findings and Observations, Principles of Kinetics, Biomechanics, Muscle Balance Theory, and Orthotic Posting and Design to the Management Plan. Videotaped Case Presentations #1 and #2.

- 10:30 Short break
- 10:45 Videotaped Case Presentations #3 and #4 - attendees form groups of 4 to sort recorded findings into orthopedic categories and set management priorities for one of the cases.
- 12:15 Lunch and Library Time
- 1:00 Review Videotaped Cases #3 and #4 - Discuss Proposed Management Strategies
- 2:00 Short Break- and Lab Participants, please change for lab
- 2:15 Introductory Assessments Lab: Attendees work in groups of 3. Hip rotation ROM, the modified Ryder's Test, hamstring length test, the patella angle, the Thigh-Foot Angle, and passive ankle DFROM
- 3:30 Introductory TheraTogs Donning and Strapping Lab: Attendees work in groups of 3.
- 5:15 Complete the Course Evaluation/ Final Q&A
- 5:30 Adjourn

## Restrictions

Capacity of this workshop is limited. Completed and paid registrations will be processed on a first-come, first served basis. **The lab on the last day is limited to 40 therapists.** First 40 therapists can participate in the lab, the rest can observe.

**Video Recording policy:** Videotaping of this program is prohibited. Audiotaping for personal review is permitted with permission from the Instructor.

### Who Should Attend?

Ms Cusick is committed to the idea of fostering the collaborative and educated team management of complex neuromotor problems. Therefore, this course is open to a range of clinicians who are likely to work together as a rehabilitation team – if you are a...

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| <ul style="list-style-type: none"> <li>• Physical Therapist</li> <li>• Occupational Therapist</li> <li>• Orthotist / Prosthetist</li> <li>• Physical Medicine &amp; Rehabilitation Physician</li> </ul> | <ul style="list-style-type: none"> <li>• Orthopedist</li> <li>• Podiatrist</li> <li>• PT Assistant*</li> <li>• Orthopedic Technician*</li> </ul> |
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...you will find this course valuable to your practice.

\* Physical Therapy Assistants may attend as part of a team that includes a qualified Physical Therapist. Orthopedic Technicians are welcome if accompanied by a CO, CPO, or PT from the same facility.