

**Tutorial #1 - Tuesday, May 23, 2017 1:00pm-3:00pm**

**Title:** Motion Analysis in Understanding Gait Pathology in Charcot-Marie-Tooth Disease

**Instructors:** Sylvia Öunpuu, MSc and Kristan Pierz, MD

**Purpose:** The purpose of this course is to describe the clinical impairments for patients with Charcot-Marie-Tooth (CMT) and the associated gait findings to build a basis for determining the most appropriate treatment for gait issues in this patient group. A comprehensive motion analysis protocol for the assessment of persons with CMT will also be reviewed.

**Intended audience:** This course is for physicians, mid-level practitioners, physical therapists, orthotists, kinesiologists and engineers who are interested in a more detailed understanding of CMT in the context of motion analysis outcomes.

**Prerequisite knowledge:** Participants should have a minimum of basic level skills in gait analysis data interpretation including joint kinematics and kinetics.

**Abstract:** CMT represents a spectrum of neurological dysfunction and is also characterized by progressive decline in strength. Treatment must be determined based on the individual patient's specific presentation in terms of impairment and associated gait issues. Individuals with CMT frequently present with foot and ankle problems such as pain, weakness, deformity, and difficulty with shoe wear. These issues will be discussed in the context of clinical impairments typical to persons with CMT. Gait analysis is a useful tool for documenting and analyzing gait pathology and has allowed for the identification of three characteristic presentations of the foot and ankle in CMT: flail foot, cavovarus foot, and toe walking. These three foot and ankle presentations in persons with CMT will be described in detail from the clinical impairments to the gait kinematic and kinetic findings. Then the treatment options

will be discussed for the particular presentation with example treatment outcomes presented. This course will provide participants with information necessary to identify gait patterns and critically evaluate treatment options. The components of a comprehensive motion analysis for this patient population will also be reviewed. The focus will be on children and youth.

**Learning objectives:** At the completion of this tutorial, attendees will:

- 1) Be able to describe CMT in terms of the etiology and associated clinical impairments
- 2) Be able to recognize the three different foot/ankle presentations for CMT disease
- 3) Be able to identify the most appropriate treatment approaches for each CMT presentation
- 4) Be able to understand the impact of treatment in terms of motion analysis outcomes

**Outline:**

- 1) Introductions and purpose (5 minutes)
- 2) CMT – background (10 minutes)
- 3) CMT Motion Analysis – Components to Consider for a Comprehensive Analysis (10 min)
- 4) The Flail Foot/Ankle – presentation in terms of clinical exam, kinematics and kinetics and treatment options (20 minutes)
- 5) Break – 10 minutes
- 6) The Cavo-varus Foot – presentation in terms of clinical exam, kinematics and kinetics and treatment options (20 minutes)
- 7) The Equinus Ankle – presentation in terms of clinical exam, kinematics and kinetics and treatment options (20 minutes)
- 8) Case examples – what we have learned (15 minutes)
- 9) Q and A – (10 minutes) and will be encouraged throughout