

Title: Gait Analysis Data Interpretation: Understanding kinematic relationships within and across planes of motion.

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Purpose: The purpose of this course is to demonstrate the role of motion analysis in gaining understanding the relationship of joint and segment kinematics within and across planes of motion for a variety of gait pathologies.

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 motion data interpretation by exploring the relationships between joint and segment kinematics both within and across multiple planes of motion.

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

Abstract: Gait analysis data interpretation is a difficult skill that takes time and requires a detailed understanding of both the motion data being analyzed as well as a the gait pathology being studied. This tutorial will provide practical information through case studies to assist in gait data interpretation. The tutorial will be divided into two components: a) background and b) case examples. The tutorial will begin with a detailed review of the key details for understanding joint angle and segment definitions in the three planes of motion. This will be facilitated by illustrations of each angle definition. The logic for understanding within and across plane interactions will then be discussed followed by the difference between compensation and secondary deviation. The tutorial will conclude by reviewing examples of within and across plane interactions. These will not be full case studies but focus on the

particular relationships in kinematics within and across plane and gait compensations for each case. Video and clinical exam data will be included when relevant. These examples of within and across plane interactions will include pre and post data as well as barefoot and brace data that help to define these relationships. The pathologies will include cerebral palsy and myelomeningocele as well as a variety of other neuromuscular and orthopedic gait disorders.

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

- 1) Have a detailed understanding of the importance of knowing angle and segment definitions.
- 2) Understand the definition of within plane kinematic interaction
- 3) Understand the definition of cross plane kinematic interaction.
- 4) Be familiar with common examples of within and across plane interactions for a variety of diagnoses.
- 5) Will be better able to identify kinematics problems and possible causes when interpreting gait data for a variety of gait pathology

Outline:

- 1) Introductions and purpose (5 minutes)
- 2) Angle and Segment definitions (20 minutes)
- 3) Definitions of within and across plane interactions (5 minutes)
- 4) Case examples – within plane interactions (30 minutes)
- 5) Break – 10 minutes
- 6) Case examples – across plane interactions (45 minutes)
- 7) Q and A will be encouraged throughout – (5 minutes)