UNC ORTHOPAEDICS

# OrthoRaMS SEMINAR SERIES

Orthopaedic Research and Musculoskeletal Science

**Thursday, October 23, 2025 12:00-1:00**

***Location:*** *Dickson Conference Room, 3200 Thurston Bldg.*
***Zoom Meeting ID:*** *988 6670 4852,* ***PW:*** *114616*


**Karen Kruger, Ph.D.**
**Research Associate Professor**
**Co-Director, Orthopaedic & Rehabilitation Engineering Center**

**Joint Dept of Biomedical Engineering**
**Marquette University**

**Co-Director, Motion Analysis Center**
**Shriners Hospitals for Children**
**Chicago**


## From Childhood to Adulthood: Innovative Tools for Evaluating Foot and Ankle Deformities


Clinical gait analysis provides an objective evaluation of walking patterns in children with orthopaedic and neurologic conditions, most commonly for preoperative planning in cerebral palsy. This analysis combines motion capture, force plate data, physical exam, electromyography, x-rays, and advanced modeling. Foot and ankle analysis is particularly challenging in this population, especially given the limitations of conventional marker-based motion capture and x-rays. This talk will focus on novel imaging modalities we are using to improve diagnoses of foot deformities. This talk presents two complementary projects that address these gaps. First, we are using weightbearing computed tomography (WBCT), a technology that provides 3D imaging with similar radiation exposure than conventional radiographs to define structural predictors of symptom progression and improve early diagnosis and treatment planning. Second, we are developing methods for use of biplane fluoroscopy for evaluating hindfoot kinematics in adults with cerebral palsy. Together, these efforts aim to bridge research from childhood through adulthood, advancing imaging and motion analysis to guide clinical decision-making and improve lifelong outcomes.


## BIO

Dr. Karen Kruger is a research associate professor at Marquette University and Scientific Staff at Shriners Children. She completed her BS in Mechanical Engineering at Michigan Technological University and PhD in Biomedical Engineering at the University of Iowa with a concentration in orthopaedic biomechanics. Her current work focuses on using motion analysis and imaging to improve diagnosis and treatment of foot disorders, with a focus on improving understanding during growth and development.