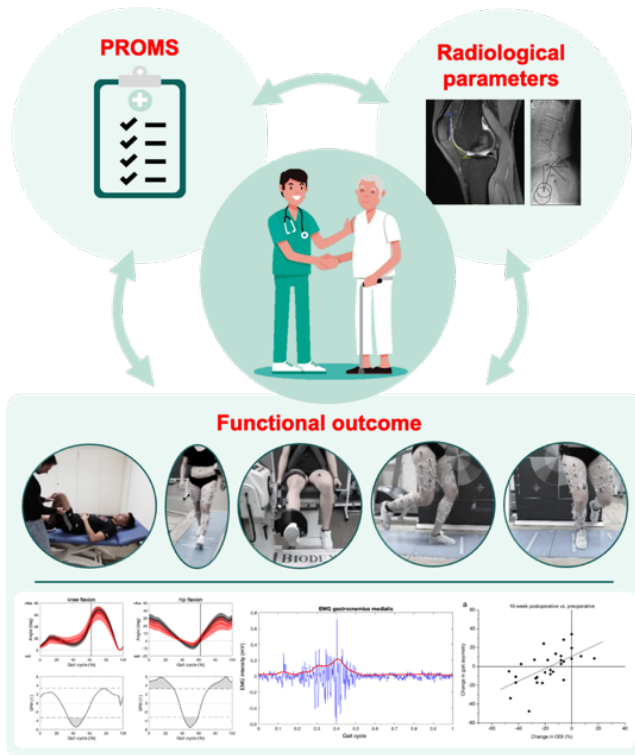


University
of Basel

Department of
Biomedical Engineering

Functional Biomechanics Research Group



Patient centred outcome research (Mündermann, Nüesch, Bühl)



Functional Biomechanics Laboratory (Mündermann)

Understanding pathomechanisms of orthopaedic conditions, developing sensor-based outcomes in orthopaedics, and improving patient care.

Our research group focuses on the development and application of validated novel sensor systems and analysis approaches with the goal of identifying relevant outcomes for orthopaedic conditions and developing wearable sensors targeting these outcomes. Moreover, pathomechanisms and implications of orthopaedic conditions are investigated using a multidisciplinary approach by combining patient reported outcome measures, movement analysis, medical imaging, blood markers and musculoskeletal modelling with the ultimate goal of diagnosing musculoskeletal diseases and conditions, monitoring disease progression and evaluating treatment.

Specific topics include:

- Unravelling the effect of ambulatory load on tissue metabolism and the role of inflammation, age and injury history
- Determining the effect of rotator cuff tear on glenohumeral translation and its dependency on additional load, anatomical and morphological variation, and injury type and severity
- Assessing joint mechanics before and after novel orthopaedic treatment such as primary repair of the anterior cruciate ligament or dynamic medial patellofemoral ligament reconstruction
- Identifying digital biomarkers using wearable sensors for gait analysis and physical activity monitoring as outcome for clinical trials
- Translating biomechanical methods into orthopaedic practice

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