UNIVERSITY
CHILDREN'S HOSPITAL
ZURICH

Rehabilitation Centre
Affoltern am Albis

3D-Gait analysis in children and adolescents with neuro-orthopaedic movement disorders

Background: An accurate and detailed evaluation of the walking pattern is inevitable to optimize surgical and rehabilitative interventions for children with neurological movement disorders who experience difficulties with walking. The Motion Analysis Lab of the Physiotherapy Department of the Zürcher Hochschule für Angewandte Wissenschaften (ZHAW) in Winterthur employs several techniques to quantify movement including: 3-dimensional tracking and reconstruction of movement kinematics, recordings of muscle activity, force plate recordings, and calculation of joint forces and torques. These techniques allow to make very exact measurements of joint movements (kinematics) and forces (kinetics) enabling the detection of very small changes in movement performance over time or due to treatment. In addition, such a detailed analysis might assist the orthopaedic surgeon in his/her clinical decision making (for example to perform surgery or not).

Goal

While these assessments are performed in almost all children and adolescents for clinical purposes, this collaboration is also valuable, as it allows us to answer various scientific questions, such as determining variables, which might successfully predict the outcome of surgical interventions, or modelling normal and pathological gait, which should increase our understanding about the mechanisms underlying movement disorders.

Project onset

July 2010

Project members

- Julia Balzer
- Corinne Ammann
- Julia Henger (Physiotherapy)
- Victoria Weps (Physiotherapy)
- Huub van Hedel

Cooperating partners

- The team members of the Motion Analysis Lab, which is part of the Research Department of the Physiotherapy Institute, headed by Markus Wirz, PhD, of the Zürcher Hochschule für Angewandte Wissenschaften (ZHAW). For more information, please visit: http://www.gesundheit.zhaw.ch/de/gesundheit/forschung/forschung-physiotherapie/bewegungslabor.html