EasyAngle - Overview of clinical studies

Summary

So far, three clinical studies have been completed. These have examined the reliability and validity of EasyAngle for measurement of the hip and knee. The studies show that the EasyAngle, in general, has an excellent reliability and validity (vs. a traditional goniometer) in studies on hip and knee.

Completed studies

Measuring the knee joint range of motion with a digital goniometer (2015)

- Author: Veronika Lind, Swedish School of Sports and Health Sciences (GIH)
- Number of subjects: 18 (9 female) with no indications.
- Objective: Investigate intra-rater reliability and validity of the EasyAngle for measurement of active and passive flexion and extension in the knee.
- Method: Intra-rater reliability was measured with a test-retest procedure, while validity was tested through measurements by an experienced PT measuring the same joint angles during the same occasion using both the EasyAngle and a traditional goniometer.
- Results: The study showed excellent reliability except for active extension that was only fair due to a software flaw. Validity proved to be good. This study was done on a prototype of EasyAngle and the software flaw has been fixed.
- Other: The study has been presented as a poster at the WCPT congress in 2017.

The effect of dynamic stretching on muscle extensibility in female horse riders (2015)

- Authors: Emelie Brinkeback and Emma Lundqvist, Karolinska Institute.
- Number of subjects: 9 (all female) with no indications.
- Objective: Investigate intra- and inter-rater reliability of EasyAngle for measurement of passive straight leg raise to estimate the length of the hamstring muscle and to evaluate the effect of a new dynamic stretching programme.
- Method: Measurements with EasyAngle was done before after the intervention to evaluate effect. Two physio therapy students performed measurements and intra-rater reliability of EasyAngle was investigated by comparing measurement results from two physio therapists for the same measurement. Intra-rater reliability was investigated by having each physio therapist do three measurements on the same patient on each occasion and comparing results.
- Result: The study showed excellent inter-rater reliability as well as excellent intra-rater reliability.

Validity and interrater reliability of EasyAngle for measurement of hip mobility (2016)

- Author: Karin Fröjd, University of Uppsala, Institution for neuroscience, physiotherapy.
- Number of subjects: 35 (20 women) with hip osteoarthritis.
- Objective: Investigate inter-rater reliability and validity of EasyAngle vs. a traditional goniometer for measurement of passive and active flexion, abduction, internal rotation and external rotation of the hip.
- Method: Inter-rater reliability was tested by having two experienced physio therapists perform the same measurement on the same patient during the same occasion.

Validity was tested by having one physio therapist perform the same measurements using both EasyAngle and a traditional goniometer.
- Result: Validity of EasyAngle proved to be excellent, inter-rater reliability was good for active abduction and active external rotation and excellent for all other movements.

Ongoing or planned studies

The following studies are ongoing or planned (scope and time of completion may change):

- Investigation of inter- and intra-rater reliability of EasyAngle for measurement of knee ROM. Karolinska Institute, Sweden (finalized, to be presented).
- Neurophysiologic influences on Hamstring and Pectoralis major flexibility - knowledge about the relative contribution of neural, muscular and joint components to facilitate new techniques in the rehabilitation of groin and shoulder pain. Examination of relative stiffness and muscle length by measuring joint angles using the EasyAngle. Umeå University, Sweden (expected done 2018).
- Investigation of validity and intra- and inter-rater reliability for measurements on cervical spine and hip performed as a part of BATH Metrical Index, BASMI in patients with ankylosing spondylitis and for measurement of hip extension in patients with hip replacement surgery. Karolinska University Hospital, Sweden (expected done 2018)
- Investigation of usability, validity and intra- and inter-rater reliability for measurement of knee and hip using the EasyAngle. CRF La Châtaigneraie, France (expected done 2018)
- Investigation of validity and reliability of the EasyAngle for measurement of cervical rotation during flexion. multicenter study (University Hospital Hamburg-Eppendorf, City University of Applied Sciences Bremen and multiple private practices in Germany and Austria.), Germany (expected done 2018)
- Technical verification of the sensor accuracy of the EasyAngle, Osnabruck University, Germany (expected done 2017)
- Investigation of usability and validity for measurement of cervical rotation using the EasyAngle. Universitätsklinikum Freiburg, Germany (expected done 2017)
- Investigation in feasibility of using the EasyAngle for children/infants with torticollis and inter and inter rater reliability for measurement of cervical spine and shoulder. Cindy Miles & Associates, USA (expected done 2017)
- Investigation of usability of the EasyAngle and how ROM changes after botox injection in patients with spasticity. Sheffield Teaching Hospital, UK (expected done 2018)
- The effect of non-invasive treatment methods on neuromuscular function in healthy people and in stroke patients. Ankle ROM is measured using the EasyAngle and a qualitative reliability investigation will be included in the study. University of Jyväskylä, Finland. (expected done 2018)
- Understanding the status of goniometry in UK and how it can be improved by the EasyAngle - a survey study. South Tees Hospitals NHS Foundation Trust, UK (expected done 2017)
- Investigation of validity and reliability of the EasyAngle for measurement of shoulder rotation and elevation. UZ Gent, Belgium (expected done 2018)
- Assessment of shoulder range of motion in wheel chair athletes using the Easy Angle. UZ Gent, Belgium (expected done 2018)
- Investigation of relationship between hamstring, gastrocnemius and rectus femoris muscle length and static and dynamic feet pressures in children with cerebral palsy. University of Juiz de Fora, Brazil (expected done 2018)