Do you want to improve your Clinical Assessment?

An important component of the clinical examination for several conditions is the assessment of muscle strength. The standard clinical evaluation and diagnostic tool for muscle strength assessment is the manual muscle testing (MMT) method, using a 5-point grading scale (Clarkson 2000; Petty 2011). Although it has been a clinically useful tool for over forty years, its accuracy and reliability remains questionable (Cuthbert & Goodheart 2007; Frese et al 1987). A reliable method of quantifying muscle strength in the clinical setting is therefore needed.

..So what to do?
Lately, thanks to my colleague Luca (www.lucamaestroni.com) ndr, I have started to use a very nice tool that I had previously ignored. I thought it was good for research but too complicated and far from the clinical use and.. I was wrong...now I cannot work without it!

**What tool am I talking about?**

The Hand held dynamometer.

![Testing setup](image)

**Test and Re-test! Yes we like it!**

Assessing and reassessing the strength during the session can help you realize if it is a real strength deficit or maybe the patient presents a condition like the AMI (arthrogenic muscle inhibition)(Rice et al 2011) or control inhibition.

**Test re-test..and all the patients like it!**

Reassessing the strength with the HHD from one session to another one can help the patient’s engagement!

An objective result can help the patient to be motivated and to keep on doing their home-exercise!
The procedure is inexpensive and easy to administer compared with traditional isokinetic testing, which makes it more suitable for the clinical setting. Different testing procedures have been reported concerning the positioning of the people being tested.

Excellent to good **intra and interrater** reliability was shown using the HHD in footballer population (Fulcher et al 2009).

An isometric testing (make-test) or an eccentric testing (break-test) can be used during the assessment of the strength. Eccentric strength testing has shown greater strength values, whereas isometric loading induces less stress to the musculoskeletal system than eccentric loading, which is relevant when testing individuals presenting with a pathology.

**Normative data** in literature exist for the lower limb (Hanna et al 2010) and for the shoulder (Reinmann et al 2010) and can guide the therapist during the delivery of a rehabilitation program. This information can be used to evaluate muscle performance during screening, rehabilitation program/documentation as well as strength and conditioning assessments/reassessment.
Further Considerations:
With the Hand held dynamometer, the capacity to generate **strength in certain positions** is assessed. This may not reflect the real problem of the patient in other functions; it is advisable to test the patient's capacities in different positions in order to have a better understanding of his/her problem.

Less strength of the **tester** can be a possible factor in HHD to affect the inter-tester reliability (Thorborg 2009). In order to reduce the problem, a **belt** (Thorborg 2013) or an **external device** can be used to stabilize the HHD (see pictures) and not to use the tester's resistance (Jackson et al. 2016).

Isokinetic dynamometers, such as the Cybex (USA) or the Biodex (USA), are considered the gold standard in simultaneous strength and angle measurements for the evaluation of dynamic muscular performance (Kannus (1994); Baltzopoulos & Brodie (1989); Osternig (1986); Lund et al. (2005); Drouin et al. (2004). In the study by Holt (Holt et al. 2016) the HHD was highly correlated to isokinetic dynamometry for shoulder internal and external rotation.

**Want to try a cheaper tool?**

The sphygmomanometer appears to be reliable for the assessment of isometric muscle strength around the hip joint, but further research is guaranteed to establish its validity (Toohey et al. 2015).
References


Holt KL, Drew MK (2016) Hand-held dynamometry strength measures for internal and external rotation demonstrate superior reliability, lower minimal detectable change and higher correlation to isokinetic dynamometry than externally-fixated dynamometry of the shoulder. Physical Therapy in Sport, 21:75-81


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