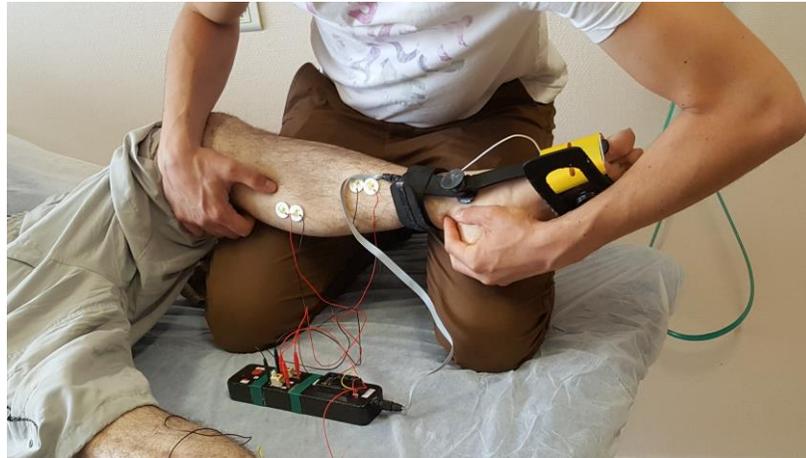




HEALTH

Ref : MA00135

# Spasticity measuring Device



## MARKET CHALLENGES

Spasticity is an exaggeration of the myotatic reflex. More specifically it is an exaggerated reflex contraction of a muscle in reaction to its stretching. The extent of the spasticity ranges from a slight increase in the muscle tone to an affected articulation, rigid in flexion and extension, that can hinder the walk.

To evaluate in a non-invasive manner the spasticity, there exists a procedure known as the "Ashworth manoeuvre". This manoeuvre consists in bending passively the ankle articulation of the patient, which triggers, in the spastic patient, a stretching reflex characterized by a brief extension of the articulation. It involves the tactile assessment of the practitioner and makes it possible to qualify the extent of the spasticity on a specific scale known as the "Modified Ashworth Scale", ranging from 0 to 4. It thus remains purely qualitative and highly subjective.

## SUGGESTED APPLICATIONS

- **Evaluation and monitoring of spastic patient** before treatment and during rehabilitation process
- **Therapeutic decision support tool**
- **Treatment monitoring:** simple quantification of the effects of medical (baclofen, dantrium) and surgical treatments (intrathecal pump delivery baclofen, neurotomy, DREZ, orthopaedics)
- **Application to other types of articulation** (knee, elbow, wrist)
- Possible applications in musculoskeletal research, in the fields of biomechanics, ergonomics, etc.

## DEVELOPMENT STATUS

A functional prototype has been developed.

**Tests on 150 different spastic patients with different levels of spasticity have been made**, by approximately 10 practitioners (surgeon, rehabilitation physician, medical intern).

## INNOVATIVE SOLUTIONS

This novel medical device allows to **determine a spasticity score of an ankle articulation in an objective manner.**

The device is composed of two parts: a first part for receiving the foot - ankle articulation (made in foam with inserted sensors) and a second part for conditioning and radio-transmission signals . Means of measurements are related to:

- the articulation reaction torque at the site of the rotational axis
- the muscular activities (2 extensors EMG)
- the articulation angle
- the manoeuvre velocity

## COMPETITIVE ADVANTAGES

- Better choices and monitoring of treatments
- Minimization of the variability between physicians quotes
- Refining of the diagnosis of the damage degrees (as a graphical localization in a new spasticity scale)
- Adaptable: the length of the first part can be modified by a sliding device allowing to fit the size of the orthosis to the foot size (European shoe size 36-47)
- Ambidextrous
- Portable, Light (95g)
- Integrated concept of third hand by vocal order
- First marks of interest by clinicians

## IP RIGHTS

Priority patent application filed in 2011

