

There are a lot of assessment scales in the field of neurorehabilitation and there is no unified protocol to use them. Because of that every expert group uses different tools. The Task Forces on Stroke Impairment, Disability, and Handicap made recommendations for all future stroke outcome research but did not endorse any specific functional instrument (WHO 1989).

Impairment measurement

The focal neurological lesion that accompanies a stroke confers on the patient a set of neurological deficits, which in rehabilitation medicine are referred to as impairments. Evaluation of these impairments constitutes an essential first step in rehabilitation management of the patient. There are different kind of manual tests to do upper limb assessments but most of them are subjectives and depending on who is doing the exploration. Furthermore, the devices we have to assess impairment are difficult to use and it is necessary to spend more time than manual tests.

The impairments we can measure are:

- ⊕ Range of Motion Assessment, some centres use simple measurements of arm movement using goniometry. Goniometry is probably too inaccurate in neurological conditions because the joint movement is clearly affected by the spasticity, which can vary from day-to-day. In spite of this goniometry is the better way to measure range of joint movement.
- ⊕ Strength, the most widely used scale to assess strength is the Medical Research Council six-point scale, 0 to 5, in which 0 represents complete paralysis, 3 is the ability to fully move the joint against gravity, and 5 indicates normal strength. In patients with upper motor neuron lesions such as stroke is not useful because they are not able to selectively activate a particular muscle in isolation. Further, as tone increases during recovery, the joint movement may be restricted by spasticity in the antagonists. Brunnstrom (Brunnstrom 1970) developed a test in which the clinician assesses the presence of flexor an extensor synergies and the degree of selective muscle activation from the synergy pattern (Brandstater 1996).
- ⊕ Muscle Tone refers to the resistance felt when the examiner

passively stretches a muscle by moving a joint. The rating is subjective and the most widely used scale is Ashworth Scale (Bohannon and Smith 1987).

- ⊕ A more comprehensive motricity evaluation is represented by the Rivermead Motricity Index that have the advantage to evaluate the overall functioning of the limbs (Wade 1989), (Collin and Wade 1990).

Other impairments like sensory impairment, balance, coordination and posture, they can be assessed with the neurological examination but there is no objective instrument to demonstrate the real improvement