This is a Sample version of the Modified Ashworth Scale (MAS)

The full version of Disability Assessment For Dementia (DAD) comes without ‘sample’ watermark.

The full complete version includes –
• MAS Overview information
• MAS Scoring/ Administration instructions
• MAS Complete Questionnaire/ Assessment
• MAS Clinical Validity

Buy full version here - for $7.00

Once you have paid for your item you will receive a direct link to download your full complete e-book instantly. You will also receive an email with a link to download your e-book. Each purchased product you order is available to download for 24 hours from time of purchase. Should you have any problems or enquiries please contact - info@agedcaretests.com
Interrater Reliability of a Modified Ashworth Scale of Muscle Spasticity

RICHARD W. BOHANNON
and MELISSA B. SMITH

We undertook this investigation to determine the interrater reliability of manual tests of elbow flexor muscle spasticity graded on a modified Ashworth scale. We each independently graded the elbow flexor muscle spasticity of 30 patients with intracranial lesions. We agreed on 86.7% of our ratings. The Kendall’s tau correlation between our grades was .847 (p < .001). Thus, the relationship between the raters’ judgments was significant and the reliability was good. Although the results were limited to the elbow flexor muscle group, we believe them to be positive enough to encourage further trials of the modified Ashworth scale for grading spasticity.

Key Words: Elbow, Muscle spasticity, Physical therapy.

Spasticity, defined herein as a velocity-dependent response of muscle to passive stretching, may be among the most commonly acknowledged sequelae of central nervous system lesions. Although the role actually played by spasticity in motor dysfunction may be less than that suggested by some authors, antagonistic muscle spasticity can limit the force demonstrated by an agonist muscle during voluntary movement.

One of the methods that has been proposed for measuring muscle spasticity involves manually moving a limb through the range of motion to passively stretch specific muscle groups. Ashworth has described a five-point ordinal scale for grading the resistance encountered during such passive muscle stretching. Ashworth’s scale grades spasticity as follows: 0 = normal muscle tone; 1 = slight increase in muscle tone, “catch” when limb moved; 2 = more marked increase in muscle tone, but limb easily flexed; 3 = considerable increase in muscle tone; and 4 = limb rigid in flexion or extension. As Ashworth’s scale assigns grades to a manually determined resistance of muscle to passive stretching, it measures spasticity as defined herein. The scale, therefore, has face validity, in addition to some of the other characteristics recommended for ordinal scales by MacKenzie and Charlson. Our previous experience with the scale revealed that many of our patients with hemiplegia demonstrated levels of spasticity defined by the grades at the lower end of the Ashworth scale and that the Ashworth grade of “1” was indiscernible. To render the scale more discrete, we added the grade “1+” and slightly modified the definitions (Tab. 1). These modifications resulted in a scale that conforms even more precisely than the Ashworth scale to the guidelines of MacKenzie and Charlson.

Although Ashworth’s subjective scale has been used clinically to examine the efficacy of Lioresal and of electrical stimulation in the treatment of spasticity, we were unaware of any studies that verify the reliability of manual tests of spasticity graded with the Ashworth scale. Lacking such verification and wishing to test the reliability of our own modification of the scale, we undertook this study. The purpose of this study was to determine the interrater reliability of a manual test of elbow flexor muscle group spasticity using the modified Ashworth scale. Our expectation was that two clinicians, who regularly use the test, could measure spasticity reliably using the modified scale.

METHOD

Patients

Thirty patients (17 men and 13 women) participated in this study. Their mean age was 59.3 ± 17.6 years (range, 19–81 years). All of the patients had lesions involving the central nervous system. One patient had multiple sclerosis, 5 had closed head injuries, and 24 had cerebrovascular accidents. The paretic or weaker side of each patient (as determined by hand-held dynamometry) was tested. Consequently, the left side was tested in half of the patients, and the right side was tested in the other half. All rehabilitation patients were tested routinely during their initial assessment; the patients who participated in this study were the first 30 patients who could follow instructions adequately. All of the patients granted informed consent before testing.

Procedure

Each patient was tested first by his or her therapist (one of the authors) and then by the other author. Testing was conducted with each patient positioned supine on a padded mat table. We extended the patient’s elbow from a position of maximal possible flexion to maximal possible extension over a duration of about one second (by counting “one thousand

---

Mr. Bohannon is Chief, Department of Physical Therapy, Southeastern Regional Rehabilitation Center, Cape Fear Valley Medical Center, PO Box 2000, Owen Dr, Fayetteville, NC 28302 (USA).
Ms. Smith is Senior Physical Therapist, Southeastern Regional Rehabilitation Center.

This is the end of the SAMPLE MAS clinical validity. Please go to page 1 to purchase complete version.
Ashworth Scale / Modified Ashworth Scale

Title of Assessment
Ashworth Scale / Modified Ashworth Scale

Link to instrument

Purpose
- Originally developed to assess the effects of antispasticity drugs on spasticity in Multiple Sclerosis
- Modified Ashworth: measures spasticity in patients with lesions of the Central Nervous System

Acronym
AS / MAS

Instrument Reviewer(s)
Initially reviewed by the Rehabilitation Measures Team; Updated by Phyllis Palmis PT, DPT and Christopher Newman PT, MPT, NCS and the SCI EDGE task force of the Neurology Section of the APTA in 9/2012; Updated with references for the TBI population by Irene Ward, PT, DPT, NCS and the TBI EDGE task force of the Neurology Section of the APTA in 2012; Updated with references for Pediatrics and Cerebral Palsy by Anna Wetzel, SPT, Brian Baranyi, SPT, and Stephanie Johnson, SPT in 11/2012.

Summary Date
26 04 2013

Description
Original Ashworth Scale:
- Tests resistance to passive movement about a joint with varying degrees of velocity
  - Scores range from 0-4, with 5 choices
  - A score of 1 indicates no resistance and 5 indicates rigidity

Modified Ashworth Scale:
- Similar to Ashworth, but adds a 1+ scoring category to indicate resistance through less than half of the movement. Thus scores range from 0-4, with 6 choices (Bohannon & Smith, 1987)

<table>
<thead>
<tr>
<th>Score</th>
<th>Ashworth Scale (1964)</th>
<th>Modified Ashworth Scale Bohannon &amp; Smith (1987)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (0)</td>
<td>No increase in tone</td>
<td>No increase in muscle tone</td>
</tr>
<tr>
<td>1 (1)</td>
<td>Slight increase in tone giving a catch when the limb was moved in flexion or extension</td>
<td>Slight increase in muscle tone, manifested by a catch and release or by minimal resistance at the end of the range of motion when the affected part(s) is moved in flexion or extension</td>
</tr>
<tr>
<td>1+ (2)</td>
<td></td>
<td>Slight increase in muscle tone, manifested by a catch, followed by minimal resistance throughout the remainder (less than half) of the ROM (range of movement)</td>
</tr>
<tr>
<td>2 (3)</td>
<td>More marked increase in tone but limb easily flexed</td>
<td>More marked increase in muscle tone through most of the ROM, but affected part(s) easily moved</td>
</tr>
<tr>
<td>3 (4)</td>
<td>Considerable increase in tone - passive movement difficult</td>
<td>Considerable increase in muscle tone passive, movement difficult</td>
</tr>
<tr>
<td>4 (5)</td>
<td>Limb rigid in flexion or extension</td>
<td>Affected part(s) rigid in flexion or extension</td>
</tr>
</tbody>
</table>

ICF Domain
Body Structure, Body Function

Time to Administer
< 5 minutes, dependent upon the number of muscles/joints tested

Number of Items
AS uses a 5 point scale (range 0 to 4); MAS uses 6 point scale (range 0 to 6)

Equipment Required
Mat Table

Training Required
None

Actual Cost
Free

Populations Tested
- Adults and children with lesions of the Central Nervous System
- Cerebral Palsy
- Multiple Sclerosis
- Pediatric Hypertonia
- Spinal Cord Injury
- Stroke
- Traumatic Brain Injury

Standard Error of Measurement (SEM)
Not Established

Minimal Detectable Change (MDC)
- Stroke:
  - (Shaw et al, 2010; n = 33; adults with upper limb spasticity at the shoulder, elbow, wrist or hand and reduced upper limb function due to stroke more than 1 month previously.)
    - Response to Botox: the magnitude of initial change in muscle tone/spasticity was approximately a one-point decrease on the MAS which reflects a clinically significant improvement.

Minimally Clinically Important Difference (MCID)
Not Established

Cut-Off Scores
Not Established

Normative Data
Not Established

Test-retest Reliability

This is the end of the SAMPLE MAS overview. Please go to page 1 to purchase complete version.
Modified Ashworth Scale Instructions

General Information (derived Bohannon and Smith, 1987):

- If testing a muscle that primarily flexes a joint, place the joint in a maximally flexed position and move to a position of maximal extension over one second (count "one thousand one")
- If testing a muscle that primarily extends a joint, place the joint in a maximally extended position and move to a position of maximal flexion over one second (count "one thousand one")
- Score based on the classification below

This is the end of the SAMPLE MAS scoring instructions. Please go to page 1 to purchase complete version.
Modified Ashworth Scale Testing Form

<table>
<thead>
<tr>
<th>Muscle Tested</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This is the end of the SAMPLE MAS questionnaire. Please go to page 1 to purchase complete version.