Evaluating Spasticity

This TelAbility Handout will help you learn more about spasticity and how it is measured

What is Spasticity?

The word "spasticity " comes from the greek word "spastikos" which means "to tug or to pull". Spasticity is a *velocity-dependent increase in muscle tone*. This means that if you try to move a spastic arm or leg, the resistance it has increases as the speed of the movement is increased.

When Should a Child's Spasticity be Evaluated

Spasticity should be checked at every medical and therapy visit, but most importantly, it should be evaluated when considering spasticity treatments (For more information, see the TelAbility handout "Treatment of Spasticity").

Whenever a child's spasticity is evaluated, it is important that s/he be:

1) Awake – since spasticity is not present when someone is asleep.
2) Calm – since being upset, tired, in pain, or uncomfortable increases spasticity.

How Is Spasticity Evaluated?

Spasticity can be evaluated in many different ways. Often, a child will go to a therapist or physician who will evaluate them independently or as part of an interdisciplinary team. There are many different tests to measure spasticity and it's important to know that there is no clear "best test" to measure spasticity. Some of the more popular ones include:

Modified Ashworth Scale – This test measures the resistance of muscles as they are moved by the examiner.

Grade	Description
0	No increase in muscle tone
1	Slight increase in muscle tone with slight catch and release or minimal resistance at end of stretch
1+	Slight increase in muscle tone with minimal resistance after catch that lasts throughout remainder of range of motion
2	Moderate increase in muscle tone but affected part still easily moved
3	Considerable increase in muscle tone with difficulty in passive range of motion
4	Affected part is rigid in flexion (bent) or extension (straight).

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Counting Beats of Clonus - The examiner looks at the presence and amount of up and down muscle contractions and relaxations (beats) at the ankle, wrist, and other joints.

Grade	Description
0	absent
1	unsustained (a few beats at a time)
2	sustained (continuous beating)
3	spontaneous/light touch provoked and sustained

Tardieu Scale – In this test the examiner moves the muscles at both slow and fast rates to see if the resistance changes with the speed of movement

Score	Description
0	No resistance throughout the course of the stretch.
1	Slight resistance throughout the course of the stretch with no clear catch at any specific angle.
2	Clear catch at a specific angle, interrupting the stretch, followed by a release.
3	Clonus which lasts less than 10 seconds when maintaining the pressure, appearing at a specific angle.
4	Clonus which lasts more than 10 seconds when maintaining the pressure, at a specific angle.

Muscle Stretch Reflexes (Deep Tendon Reflexes) – In this test, the examiner uses a rubber hammer or other object to lightly tap on a tendon at the knee, elbow, or other joints. Note: Because there may be a wide variety of responses to identical tendon taps, 10-20 taps are usually recorded, then averaged. While there is some correlation, the exact relationship between increased reflexes and degree of spasticity is still unclear.

Grade	Description
0	No reflex jerk
1	Lower than normal reflex
2	Normal reflex
3	Higher than normal reflex
4	Exaggerated reflex along with clonus

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Penn Spasm Frequency Scale – Usually a report of how often muscle spasms are happening.

Grade	Description
0	no spasms
1	spasms induced only by stimulation
2	spasms occurring less than once per hour
3	spasms occurring more than once per hour
4	spasms occurring more than 10 times per hour

Functional Tests – These tests help look at the child's overall functional abilities in communicating, performing activities of daily living, moving around, etc.

- **Wee-FIM** – Functional Independence Measure for children
- **GMFM** – (Gross Motor Functional Measure) for children with CP and Down Syndrome
- **PEDI** – Pediatric Evaluation of Disability Inventory

Things to Remember

Spasticity is not always bad – for example, some leg spasticity may be useful in helping to keep a child's legs straight when standing. Spasticity can also help you know when something is wrong since it usually increases when a child is sick, in pain, tired or upset.

When evaluating spasticity, always keep in mind that the goals for management are improving function or comfort.

AUTHOR: Joshua Alexander, MD pdrehab@med.unc.edu
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