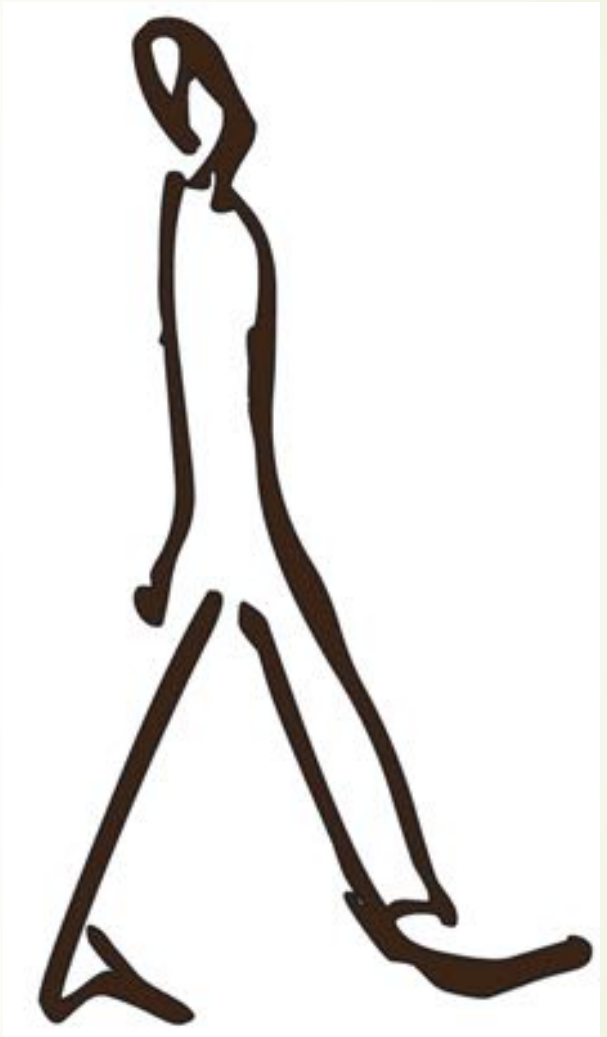
Know Your Brain: Spasticity

STEPS Live

Katie Stephens, PT, NCS



What is spasticity?

- A condition in which there is an abnormal increase in muscle tone or stiffness of muscle, which might interfere with movement, speech, or be associated with discomfort or pain
- Usually caused by damage to nerve pathways within the brain or spinal cord that control muscle movement
- Conditions
  - Spinal cord injury
  - Stroke, brain or head trauma
  - Multiple Sclerosis
  - Cerebral Palsy
- Symptoms
    - *hypertonicity* (increased muscle tone)
    - *clonus* (a series of rapid muscle contractions)
    - exaggerated deep tendon reflexes
    - muscle spasms
    - fixed joints (contractures)

Source: National Institute of Neurologic Disorders and Stroke

Functional Implications of Spasticity

- Pain
- Tightness
- Clenched fist
- Shoulder pain with movement, especially when lifting the arm
- Inability to get foot flat on floor
- Turning of ankle
- Inability to straighten knee
- Can make positioning and movement more difficult
- Can interfere with personal care and hygiene in more severe cases

Does spasticity change over time?

- It can!
- Often flaccid (limp) immediately after injury
- "Tone" can, and often does, increase over time
- How severe it gets varies from person to person
- Some survivors move from "limp" to normal without ever having spasticity

What happens if spasticity is not addressed?

- Contractures
- Mobility issues
- Pain
- Reduces potential for functional recovery

What makes spasticity worse?

STRESS!!!

Possible sources of stress that increase spasticity

- Cold
- Effort
- Emotional stress – worry, busy
- Fatigue/cognitive overload
  - Driving
- Prolonged static postures
  - sitting too long
  - not using splints
  - laying in bed
- Infections
  - UTI, URI, COVID-19
  - often first sign in an unusual increase in tone
- Associated reactions – cough, yawn, sneeze
- Weather changes – barometric pressure, rain, cold
  - *If people with arthritis can feel the weather changing in their bones, then people with spasticity feel it in their muscles!*

What makes spasticity better/reduces the effects of spasticity?

- Conservative Measures
  - Stretch
  - Splinting/Positioning

Static Splint

Dynamic Splint

Serial Casting

What makes spasticity better/reduces the effects of spasticity?

- Conservative Measures
  - Stretch
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  - Compression

Compression Garments

What makes spasticity better/reduces the effects of spasticity?

- Conservative Measures
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  - Compression
  - Vibration/Rocking/Oscillation

Use with caution
for spasticity

This might be more like it!

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- Conservative Measures
  - Stretch
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  - Compression
  - Vibration/Rocking/Oscillation
  - Electrical Stimulation

TENS or Interferential Current
Reduces spasticity by reducing pain or providing a relaxing sensation

NMES
Reduces spasticity by activating/strengthening the muscle opposite the spastic muscle

Functional Electrical Stimulation
Using electrical stimulation with exercise to fatigue spastic muscles or with function to assist movements

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  - Compression
  - Vibration/Rocking/Oscillation
  - Electrical Stimulation
    - TENS/Interferential Current
    - NMES
    - Functional Electrical Stimulation
- Warmth
  - warm shower/bath
  - Hot pack/heating pad
  - warm clothes (hand warmers in the winter)
  - Neutral warmth – serial casting, compression garments
- Movement
  - Exercise/stretch
  - Continuous alternating reciprocal movement (bike, NuStep)
- Weight bearing

Medications for Spasticity Management

- Oral Medication
  - Usually taken as a pill
  - Acts on entire system
  - Good for individuals with spasticity in many muscles
  - Relaxes all skeletal muscles
  - Relaxation effect can make individuals sleepy
- Typical Medications
  - Baclofen
  - Zanaflex

Zanaflex (tizanidine)

- Typically start at a 2 mg dose, one or more times/day
- Max dose is 36 mg/day
- *Typically used when spasticity is due to a brain issue*
- Can be hard on the liver

Baclofen (lioresal)

- Start with 5 mg 1-3 times/day
- Max dose – 80 mg/day (20 mg 4 times/day)
- *Typically used when spasticity is due to a spinal cord issue*
- Can be injected directly around the spinal cord
  - Intrathecal Baclofen Pump
  - Allows for much smaller dose
  - Less fatiguing

Baclofen vs. Zanaflex – Which One?

- Depends on the preference of the prescribing provider
- If one is not working, can switch to the other
- Primary care providers may not be as familiar with these medications
- Physical Medicine and Rehab doctors (physiatrists) or Neurologists will be the most knowledgeable about these medications

“Local” Medications

- Act directly on the spastic muscles
- Does not make the person sleepy
- Injection
  - Phenol (not typically used in this area)
  - Bo-tox (more common)

**Combination treatments – oral medication plus injections

Bo-tox (Botulinum toxin A)

- Various "brands" available
  - Often provider dependent
  - Once you start with a brand, stick with the same brand until it stops working (similar to medications for blood pressure, etc.)
- Injections typically performed by neurologist or physiatrist with special training
- 12 weeks between injections
- Peak effectiveness in 10-14 days
  - Some individuals note an improvement as soon as the day of the injection
- There IS a max dose that can be given at one time
  - If multiple muscles affected, need to prioritize which to inject
  - Input from therapist can be helpful to injecting provider

Bo-Tox – what does it do?

- "Turns down the volume" on over-active muscles
- Removes a barrier to therapy
- Allows for release, stretch and inhibition of over-active muscles and activation of under-active muscles
- Best when injections can be combined with therapy
  - Stretching/splinting program
  - Activation and strengthen of opposing muscles
- Can be useful for some as an isolated intervention if it allows for easier personal care, hygiene or pain relief
- Sometimes a single injection can jump-start recovery, but most often multiple injections are needed

Bo-Tox – what it does NOT do!

- Restore movement
- Cure spasticity
  - Much like medications for diabetes do not cure the diabetes, they only aide in *management*

Think of Bo-Tox as an intervention that aides your therapy program, removes barriers and helps your therapy be more effective and successful. Bo-tox is a tool, it is NOT the treatment.

Take home messages…

- Spasticity does change over time – for better or worse
- Therapy and medications can help
- It is important to know what makes your spasticity better and worse
  - Avoid triggers as much as possible
- Pay attention to your spasticity
  - Often a sudden change in your spasticity is telling you something else is going on in your body

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