Physical Therapy Prescription for Spasticity in Multiple Sclerosis

Allison Pieracci and Janae Millman
Edited from original version created by Adam Beckinger, Wes Havens, Yulia Ionova, Miranda Campisano, and Erik Nielson

80% of patients with MS present with some level of spasticity.\(^1\)
It is a cause of secondary impairments such as contractures, postural deformities, and decubitus ulcers.\(^2\)

Objective Measures

MAS Modified Ashworth Scale is the gold standard for assessing spasticity\(^3\)
MSSS-88 Multiple Sclerosis Spasticity Scale\(^4\)
MFIS Modified Fatigue Impact Scale
Spasticity can increase fatigue levels due to increased energy expenditure to overcome the spastic limb\(^5\)

Treatment According to Bello-Haas Stages

Stage I Preventive
Teach tools before they are a necessity

Patient Education:
- Stress importance of HEP for daily stretching with emphasis on antigravity muscles (quadriceps, adductors, and plantar flexors) holding for 30-60 seconds 5-10 times per day\(^2\)
  - The overall effectiveness of stretching on spasticity is still inconclusive.\(^15\)
- ROM activities to help maintain joint integrity such as PNF diagonal patterns.
- Avoid exacerbating factors such as extreme temperatures, heat and humidity, tight clothing or shoes, infections, cold and flu, dehydration, stress\(^6\)
- Small doses with appropriate rest to avoid excessive fatigue in a cool environment (fans or air conditioning)\(^7\)

Therapeutic Exercise:
- Yoga, Tai Chi, or aquatherapy in cool water\(^8\)
  - Yoga, such as Iyengar with sustained positions, also helps to improve fatigue compared to control groups\(^9\)
- Relaxation training exercises or biofeedback to decrease hypertonicity could be incorporated\textsuperscript{10}
- Frenkel’s exercises can be prescribed to be completed in a smooth, slow, and even paced manner to help with voluntary control of limbs in different positions \textsuperscript{8}
- Cardiovascular exercise such as unloaded, non-resistance cycling for 20-30 minutes showed decreased MAS scores for 30 minutes post exercise along with anti-spastic medication. This also could help decrease subjective spasticity accounts using the Multiple Sclerosis Spasticity Scale-8\textsuperscript{11,12}

\textbf{Stage II Compensatory}

\emph{Prolong and encourage self-efficacy}

\textbf{Patient Education:} medications, side effects, effectiveness of HEP with meds
- Continue with interventions of Stage I with adjustments for progressive changes in spasticity or fatigue
- Positioning to decrease spasticity:
  - Prolonged position 30 min decreases stretch reflex activity\textsuperscript{2}
  - Extensor tone most common: most effective are activities that stress LE flexion and trunk rotation\textsuperscript{8}
  - Supine hooklying with trunk rotation: have patient place ball under bent legs and then gently rock the ball back and forth\textsuperscript{8}
  - Quadruped to side sitting \textsuperscript{8}

\textbf{Re-evaluate Objective Measures as needed}

\textbf{Therapeutic Exercise:}
- Avoid fast movements in HEP and interventions\textsuperscript{10} since spasticity is velocity dependent\textsuperscript{2}
- Exercise antagonistic muscles to help spastic muscles (reciprocal inhibition).\textsuperscript{8}
  - Use E-stim if necessary.\textsuperscript{2}
  - Cold packs can temporarily reduce spasticity by decreasing
tendon reflex excitability, but effects are short-lived (minutes to hours)\(^2\)

- Continue Frenkel’s Exercises (stress timing)
- Passive, assisted stretching such as PNF stretching (hold-relax, contract-relax).\(^8\)
- Baclofen has been shown to be helpful in combating spasticity when combined with exercise and stretching in the middle of the dosing cycle.\(^2,13\)

**Assess need for DME (w/c, walker, crutches, bathroom equipment)**

**Stage III Maintenance**

*Encourage self-efficacy and teach the caregiver the tools*

**Caregiver Education:**

- Teach all items from Stage I, with the following additions:
  - Turning and positioning schedule (change every 2 hours)\(^8\)
    - Prolonged or static positioning in any fixed posture can be harmful to a patient with strong spasticity and should be avoided\(^2\)
  - Transfers\(^14\)

**Assess need for splinting to prevent contractures.**

- Mechanical positioning devices (resting splints, toe or finger spreader, ankle splint) can help maintain various positions, which will help preserve joints\(^8\)
References

2) Physical Rehabilitation. pg. 800
3) Physical Rehabilitation. pg. 791
4) Physical Rehabilitation. pg. 790
8) Physical Rehabilitation, pg. 801
10) Kushner and Brandfass, 2004