Physical Therapy Prescription for Spasticity in Multiple Sclerosis

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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[11]
MFIS Modified Fatigue Impact Scale[4]
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[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[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-88[11, 12]

Stage II Compensatory

Prolong and encourage self-efficacy

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[2]
    - Extensor tone most common: most effective are activities that stress LE flexion and trunk rotation[8]
    - Supine hooklying with trunk rotation: have patient place ball under bent legs and then gently rock the ball back and forth[8]
    - Quadruped to side sitting[8]

Re-evaluate Objective Measures as needed

Therapeutic Exercise:

- Avoid fast movements in HEP and interventions[10] since spasticity is velocity dependent[2]
- Exercise antagonistic muscles to help spastic muscles (reciprocal inhibition).[8]
    - Use E-stim if necessary.[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

1) Physical Rehabilitation *5th Ed.* O'Sullivan, S. and Schmitz, T. F.A. Davis Co, Philadelphia, 2007, pg. 781.
2) Physical Rehabilitation, pg. 800
3) Physical Rehabilitation, pg. 791
4) Physical Rehabilitation, pg. 790
5) Kushner, S. & Brandfass, K. (2004). Spasticity. Retrieved September 7, 2009 from National MS Society Website: www.nationalmssociety.org/download.aspx?id=147
6) Holland, N.J., Stockwell, S. (2007) Controlling Spasticity in MS: Managing Specific Issues. Retrieved September 8, 2008 from National MS Society Website: http://www.nationalmssociety.org/download.aspx?id=52
7) Heat and Temperature Sensitivity. (n.d.) Retrieved September 8, 2008 from National MS Society. Website: http://www.nationalmssociety.org/about-multiple-sclerosis/treatments/exacerbations/heattemperature-sensitivity/index.aspx
8) Physical Rehabilitation, pg. 801
9) Oken, Kishiyama, SA., Zajdel, D., Bourette, D., Carlsen, J., Haas, M., Hugos, C., Kraemer, DF., Lawrence J., & Mass, M. (2004). Randomized control trial of yoga and exercise in multiple sclerosis. Neurology, 62, 2058-2064.
10) Kushner and Brandfass, 2004
11) Sosnoff, J.; Motl, R., Snook, E., & Wynn, D. (2009). Effect of a 4-week period of unloaded leg cycling exercises on spasticity in multiple sclerosis. Neurorehabilitation, 24 (4), 327-331.
12) Motl, R., Snook, E., & Hinkle, M. (2007). Effect of unloaded leg cycling on spasticity in individuals with MS using anti-spastic medications. Neuroscience, 117 (7), 895-901.
13) Brar, S, et al: Evaluation of treatment protocols on minimal to moderate spasticity in MS. Arch Phys Med Rehab, 72,186, 1991.
14) Patient Care Skills *5th Ed.* Duesterhaus Minor, M. and Duesterhaus Minor, S.. Prentice Hall, New Jersey 2006, pgs. 197-262.
15) Bovend'Erdt, T., Newman, M., Barker, K., Dawes, H., Minelli, C., Wade, D. (2008). The effects of stretching in spasticity: A systematic review. Archives of Physical Medicine and Rehabilitation, 89 (7), 1395-1406.