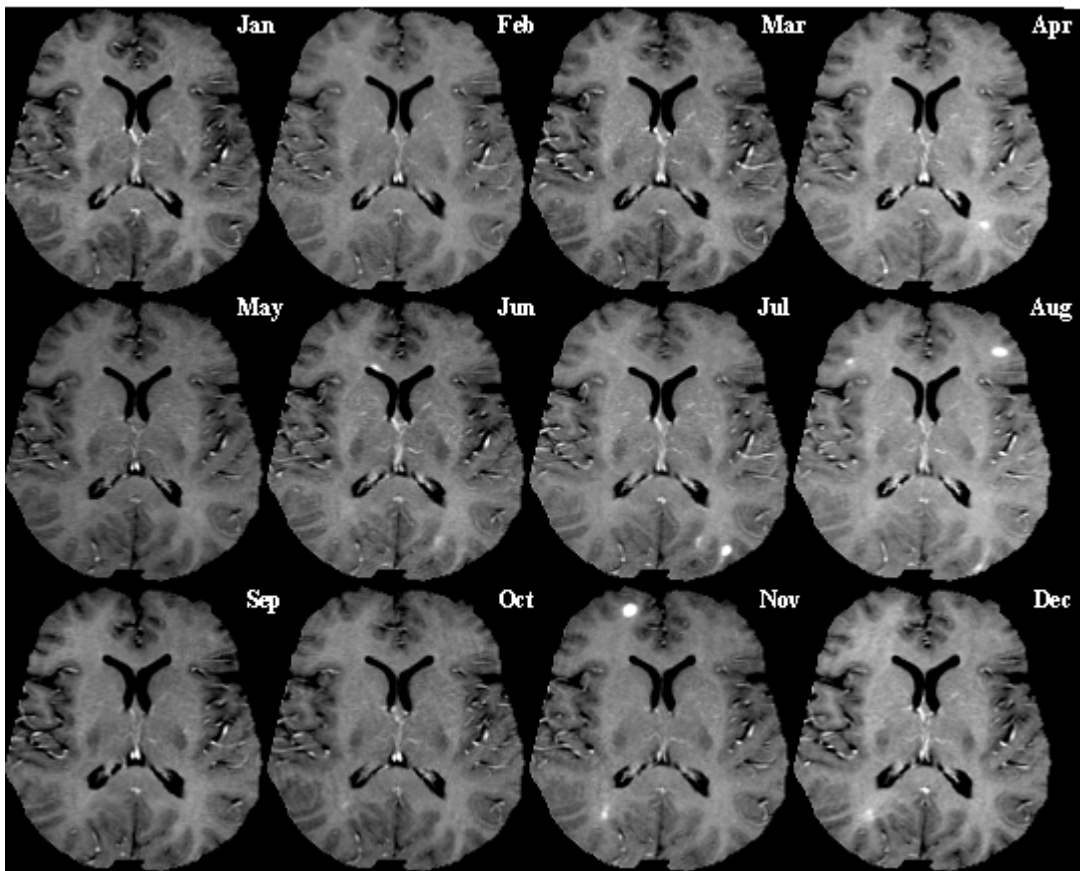


Guidance from the literature: Multiple Sclerosis

Disclaimer: This document is not intended to provide definitive guidance on diagnosis and treatment of patients with Multiple Sclerosis. It provides clinicians with general information on certain disease processes that may assist in clinical decision making. Specifically, Empi/VitalStim has not requested nor received specific clearance from the US FDA for the use of NMES for dysphagia in this patient population. Clinicians are advised to consult the professional literature for information specific to that condition and use best practice guidelines in determining treatment intervention.

Background

Multiple Sclerosis (MS) is an autoimmune disease of the central nervous system (CNS) in which the material that surrounds and protects nerve cells, the myelin sheath, is attacked resulting in subsequent decreased functioning.



Multiple Sclerosis: T1-weighted MRI (post-contrast) of same brain slice at monthly intervals. Bright spots within the brain tissue indicate active lesions. (from: Wikimedia Commons. Accessed on 9/26/08 at http://en.wikipedia.org/wiki/Image:Monthly_multiple_sclerosis_MRI.gif)

Guidance from the literature: Multiple Sclerosis

Pathophysiology and Presentation

The specific cause of MS remains unknown. During MS exacerbations, the body's immune system attacks and damages the myelin sheath surrounding the nerves in the central nervous system.¹ Destruction of the myelin causes degradation of nerve signals resulting in impaired function. Demyelinated areas of the brain or spinal cord present as plaques, which are frequently visible with MRI.

Symptoms of MS can include visual disturbances, muscle weakness, trouble with coordination and balance, impaired sensation such as numbness, prickling, or "pins and needles", and thinking and memory problems.³

The course of MS is difficult to predict, and the disease may at times either lie dormant or progress steadily.² The symptoms decrease when the attack subsides. Depending on the form of MS, as the disease progresses function may no longer return to normal after an exacerbation, and a gradual deterioration of functional performance may be evident. Several subtypes, or patterns of progression, have been described.

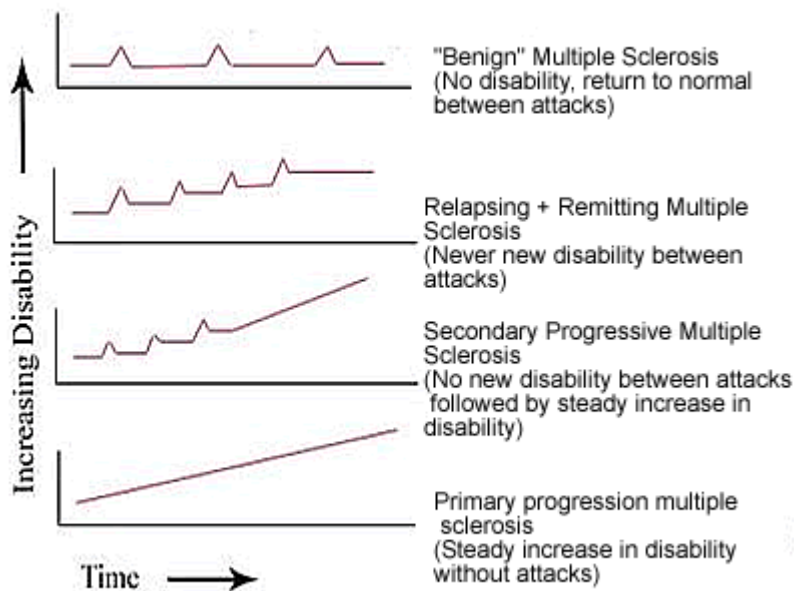


Diagram representing the different types of multiple sclerosis. (From: Department for Work and Pensions. Accessed on 9/26/08 at http://www.dwp.gov.uk/medical/med_conditions/ms/)

Typical dysphagia dysfunction

The oral phase of the swallow is frequently compromised in MS, commonly with swallow delays present. Decreased hyolaryngeal excursion, weakening pharyngeal constriction, and poor coordination of laryngeal and UES function all tend to present early in the progression of the disease process. Penetration and aspiration may become apparent in more severe cases of MS with a weakening of the pharyngeal constrictors and characteristic poor UES opening.

Management

Corticosteroids can be prescribed for patients with MS as these medications can reduce inflammation and thereby shorten an attack. There are also medications that control the immune system and can slow the rate of disability.

Management of dysphagia:

1. Modification of food and fluid consistency as needed
2. Exercise for strengthening
3. Energy conservation techniques

Role of NMES: Because multiple sclerosis is a chronic disorder in which there may be intermittent periods of recovery or remission, the indications for and the application of NMES will vary with the symptoms and functional limitations.

Given the demyelinated condition of the peripheral nerves during an acute attack, NMES is most appropriate to use when the patient is not in the midst of an exacerbation. NMES can be used in an effort to improve function by decreasing weakness that may result from disuse after an attack.

Literature review

There is little published research about MS and dysphagia treatment. Information from the PT literature may provide information about the possible benefits and effects of exercise with MS in general.

- Rietber MB, Brooks D, Uitdehaag BMJ, Kwakkel G. **Exercise therapy for multiple sclerosis.** *Cochrane Database of Systematic Reviews* 2004, Issue 3.

Findings: A review of the literature about exercise and MS was published by Rietber, et al. In their review of 9 high-methodological-quality randomized control trials about MS and exercise, the best evidence synthesis showed the following:

- Strong evidence in favor of exercise therapy for patients with MS compared to no exercise
- No evidence of deleterious effects (fatigue)
- Exercise can be beneficial for patients with MS not experiencing an exacerbation

Bogaardt H, van Dam D, Wever NM, Bruggeman CE, Koops J, and Fokkens WJ. **Use of neuromuscular electrostimulation in the treatment of dysphagia in patients with multiple sclerosis.** *Ann Otol Rhinol Laryngol* 118: 241-246, 2009.

Objective: Evaluate NMES as a method to treat dysphagia in multiple sclerosis

Subjects: 25 patients with multiple sclerosis and swallowing problems. 16 male, 9 female, average age 53.1 years.

Method: Patients received 6 treatment sessions over 3 weeks (2 sessions per week). Patients were instructed to swallow as soon as they felt the electricity, which surged in and out at set intervals for 20 minutes. The suprahyoid (submandibular) and thyrohyoid muscles were stimulated to facilitate hyolaryngeal excursion.

Guidance from the literature: Multiple Sclerosis

Outcome measures: Results on a timed swallowing task (speed of swallowing different consistencies); score on Penetration-Aspiration scale and on Dysphagia Severity Scale as measured with FEES; Quality of Life score.

Results: Patients demonstrated a significant decrease in pyriform pooling, significantly less aspiration of thin liquids and improved self reported swallowing ability and quality of life.

References

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2. About MS. National Multiple Sclerosis Society. www.nationalmssociety.org
3. Multiple Sclerosis. Medline Plus, July 23, 2008.
<http://www.nlm.nih.gov/medlineplus/multiplesclerosis.html>