Multiple Sclerosis & Ambulation

Walking / Ambulation

- Frequently impaired
- 65% of patients walking after 20 years of onset
- Early problems
  - Poor balance
  - Heaviness of 1+ limbs
  - Hip flexor weakness (sitting)
  - Dorsiflexor weakness (foot drop → circumducted gait pattern)
- Later problems
  - Clonus
  - Spasticity
  - Sensory loss
  - Ataxia
  - Weakness
  - Quads (knee hyperextension, trunk flexion, increased lumbar lordosis)
  - Hip abductors (Trendelenburg gait w/ lean to weak side)
- Standing / Walking
  - Stress safety
  - Stable base of support
  - Maximum WB – Les
  - Biomechanics

Research (limited specific to MS)

  - First reported use of BWS/TM for patient with MS
  - “Client demonstrated improvements in gait speed, gait endurance, and balance postintervention and maintained the improvements at a 2-month follow up.”
- Effect of Aerobic Training on Walking Capacity and Maximal Exercise Tolerance in Patients With Multiple Sclerosis: A Randomized Crossover Controlled Study. Rampello, A. et al. 2007
  - AT is more effective than NR in improving maximum exercise tolerance and walking capacity
  - AT is beneficial for patients not experiencing exacerbations
  - Results tempered w/ high participant loss
    - AT may cause harm to patients w/ MS
  - More research must be done

Gait parameters and characteristics examined:

- Speed
- Kinematics
- Stability
- Safety
- Endurance
Special Tests:
- 10 m velocity test – gauge safety of pt. in community
- 6 min walk test – tests endurance
- TUG - safety in home (chair to bathroom or bed to cammode)
- Ambulation Index - ordinal measure to assess the need of an assistive device
- Dynamic Gait Index – “developed by Shumway-Cook to evaluate and document a patient’s ability to modify gait in response to changing task demands in amulatory patients with balance impairments.” (p. 396)
  - Motor Control: Translating Research into Clinical Practice
    - Assessment tool p. 395-396
    - Valid and reliable
- Rivermead Visual Gait Examination – developed as a method to structure visual gait assessment.
  - Motor Control: Translating Research into Clinical Practice
    - Assessment tool p. 411
    - Valid and reliable

Important Note: The PT’s test choice is still energy conservation and expenditure dependent. PTs must take a good history (of patient a/o caregiver) to determine the most appropriate test.

Orthotics and assistive devices essentials:
- Alignment and fit
- Safety
- Practicality
- Ease of use
- Energy conservation and expenditure

Wheelchair skills essentials:
- Functional mobility
- Management
- Safety
- Transfer skills
- Energy conservation and expenditure

Impairment tests:
Observation of pt.’s gait for foot drop - may be a sign of fatigue

Early Stage: In the early phases of MS, patients are generally still at a high enough level of functioning that they do not usually seek treatment through physical therapy at this point. But, in the small percentage of cases seen in physical therapy, the PT's primary goal for the patient is to slow the progression of the disease from entering the middle or late stages. The main focus of treatment for MS by physical therapy is patient education. In the early stage, we want to start the patient on a walking and exercise program. We would use the results from special tests and evaluation to design a home exercise plan specific to the patient's individual needs. The home exercise plan would need to incorporate functional strength training of lower extremity muscles such as step-ups, wall squats and sit-to-stands to improve both strength and ambulation. A walking program must be designed according to the patient's tolerance to minimize fatigue, which can lead to exacerbations. The patient should keep a log of how long they are able to walk before fatigue sets in, and how long it takes to recover from fatigue, so that the therapist can set up a walking routine that works best with their individual needs. Patient education in this stage also focuses on what the patient can expect from the progression of the disease, such as equipment needs and home safety revisions for the future.
Middle Stage:
As a patient progresses into the middle stage of MS, the PT’s goals should focus on limiting increases in impairments and decreases in function (ambulation) while continuing to educate and enforce an energy conservation and expenditure plan. Exercise and task-specific training continue as primary modalities. In addition, it’s important to teach compensatory strategies to maximize function and energy conservation. In terms of ambulation, compensation can come in the form of: 1) assistive equipment, 2) caregiver training. Assistive equipment can include a cane, crutches, walker, or wheelchair. The considerations for assistive equipment are listed above. If drop-foot is present, the patient can utilize ankle-foot orthoses (AFO). Along with the prior considerations, maintaining skin integrity while using AFO’s becomes very important especially if sensory deficits are present. Educating and training the caregiver in proper gait assistance becomes important, as well (guarding, durations, use of gait belts). Although a goal may be to ambulate the patient as much as tolerable, fatigue may occur sooner during exercise. So, set up breaks for the patient as well as instruct the patient to have chairs or benches around the house to sit and rest. Bouts can be up to 30 minutes, but PTs must observe the patient for signs of fatigue and rest often.

Late Stage: During the late stage of MS, patients should be focused on conserving energy. One of the ways to best accomplish this is through the use of a powered wheelchair in place of walking part time. Many patients who are still able to ambulate fairly well are against using a wheelchair, so the PT needs to educate the patient or caregiver on the necessity to conserve energy and minimize fatigue related to too much walking. However, the patient should still continue some walking or other lower extremity weight bearing exercises to minimize the risk or progression of osteoporosis. Also, during this stage the therapist needs to be concerned with a greater fall risk in their patients, and take appropriate precautions to help avoid falls. (ie: bedside commode, hand rails etc).

References


