

Occupational Therapy in Multiple Sclerosis: Enhancing Function

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Objectives

1. Recognize potential impact of symptoms on ADL performance.
2. Understand the role of O.T. in symptom management.
3. Understand options for rehabilitation and compensation to maximize ADL performance.

The Goal of Occupational Therapy



- The primary goal of occupational therapy is to enable people to participate in the activities of everyday life. Occupational therapists achieve this outcome by working with people and communities to enhance their abilities to engage in the occupations they want to, need to, or are expected to do, or by modifying the occupation or environment to better support their occupational engagement.

World Federation of Occupational Therapy: Definitions of OT from Member Organization update (2011)

Occupational Therapy

- **Activities of Daily Living**

Tasks of everyday life. Basic ADLs include eating, dressing, getting into or out of a bed or chair, taking a bath or shower, and using the toilet.

- **Instrumental Activities of Daily Living**

Instrumental activities of daily living (IADL) are activities related to independent living and include preparing meals, managing money, shopping, doing housework, using a telephone, and driving.



Occupational Therapy Assessment

- Assess occupational function
 - Identify occupational needs
 - Evaluate ability to carry out roles
 - Evaluate ability to carry out specific tasks and activities (Task Analysis)
 - Evaluate safety
 - Evaluate need for environmental modifications and/or adaptive equipment

MS Symptoms that may Affect ADL Performance

- Fatigue/Heat Intolerance
- Motor Weakness/Spasticity
- Ataxia/Tremor
- Fine Motor Coordination Deficits
- Cognitive Deficits
- Depression/Psychosocial Issues
- Visual Acuity/Visual-Perceptual Deficits
- Sensory Deficits/Pain
- Balance/Mobility Deficits
- Bowel/Bladder Problems

Fatigue in MS

- **Primary MS Fatigue** – referred to as *MS lassitude*
 - Probably due to impaired conduction of nerve impulses
- **Secondary Sources of Fatigue**
 - Sleep disturbances
 - Spasticity
 - Medication side effects
 - De-conditioning
 - Other medical conditions
 - Obesity
 - Depression
 - Noxious stimuli
 - Extra exertion required for daily activities
 - Temperature sensitivity



Assessment of Fatigue

- Use self assessments:
 - Fatigue Severity Scale (FSS)
 - Fatigue Impact Scale (FIS)
 - Modified Fatigue Impact Scale (MFIS)
- Have them describe their fatigue:
 - How it feels
 - What seems to precipitate it
 - What seems to relieve it
- Describe typical day
- Discuss possibility of secondary sources

Energy Management Strategies

- Light to moderate exercise
- Spasticity management
- Promote proper posture/trunk stability
- Energy conservation techniques (rest breaks, pacing, prioritizing, recognizing warning signs, task simplification, delegate)
- Appropriate use of devices for mobility and ADL's
- Use of assistive technology
- Address sleep patterns
- Promote healthy lifestyle changes (stop smoking, good nutrition)
- Cooling/Heat management



Heat Management Strategies

- Keep environment cool, especially during exercise (62–66 degrees F; 16–18 C)
- Exercise in cool pool (< 85 degrees F; <29
- Avoid hot baths/showers
- Hydrate with cool liquids/frozen drinks
- Use cooling packs/scarves
- Use cooling vest/garment
- Wear light-weight, loose-fitting clothing
- Rest after exerting activities



Upper Extremity Dysfunction in MS

- Dysfunction can be caused by one or more sources:
 - Decreased ROM
 - Decrease motor control (tremor, apraxia, dysmetria)
 - Decrease fine motor coordination
 - Decrease strength
 - Spasticity
- Neurological impairments may lead to orthopedic impairments.



Assessment of the Upper Extremity

- AROM/PROM
- Strength
- Tone
- Sensation
- Posture/positioning
- Fine motor coordination



Spasticity

- Velocity dependent increase in muscle tone do to passive stretch, characterized by increased resistance to passive motion, involuntary muscle contractions, and hyper-reflexia.
- Use of standardized assessments:
 - Ashworth Scale
 - Modified Ashworth Scale
 - Spasm Frequency Scale



Modified Ashworth Scale

Score	Criteria
0	No increased tone
1	Slight increased tone (catch and release at end of ROM)
1+	Slight increase in tone manifested by a catch followed by min. resistance throughout the remainder of the ROM (less than half the ROM)
2	Marked increase in tone through most of ROM but affected part(s) move easily
3	Considerable increased tone, passive movement difficult
4	Affected part(s) rigid in flexion or extension

Spasm Frequency Scale

0	No spasms
1	No spontaneous spasms except with vigorous stimulation
2	Occasional spontaneous spasms and easily induced spasms
3	More than 1 but less than 10 spontaneous spasms per hour
4	More than 10 spontaneous spasms per hour

Spasticity Management

- Stretching/ROM
- Yoga
- Weight bearing/joint compression
- Positioning
- Orthotics/Splinting
- Modalities
- Air splint
- Relaxation techniques/biofeedback
- Discuss effectiveness of medications with medical team
- Assess for botulinum injections &/or Baclofen pump





Coordination

- Involves timing of movements in multiple muscle groups to achieve skilled, voluntary movement
- Fine motor coordination of the hand: represents highest level of sensory-motor integration
- Spasticity, visual status, and sensation influence eye-hand

Coordination Assessments

- 9 Hole Peg Test
- Part of the Multiple Sclerosis Functional Composite (MSFC)
- Grooved Peg Test
- Box and Blocks Test



Coordination Treatment

- Treatment should focus on:
 - Strengthening
 - Voluntarily controlled movement/motor planning
 - Sequencing and speed of movement
 - Stretching
 - Repetition of movements
 - Use meaningful functional tasks
- Issue home exercise program



Tremor

- Difficult and frustrating symptom for patient and therapist
- Affects one-quarter of people with MS
- Usually involves the head and arms
- Frequently exacerbated by stress and anxiety
- Contributes to fatigue
- Need to determine nature of the tremor “resting” or “intention” or both
- Assess interference with function

Treatment of Tremor

- Self-stabilization
- Proximal stabilization
- Bracing/Splinting
- Air splints
- Light weights (1/2-1 lb)
- Frequent rest breaks
- Weight bearing
- Adaptive equipment
- Environmental modifications
- Medications
- Surgical deep brain stimulation

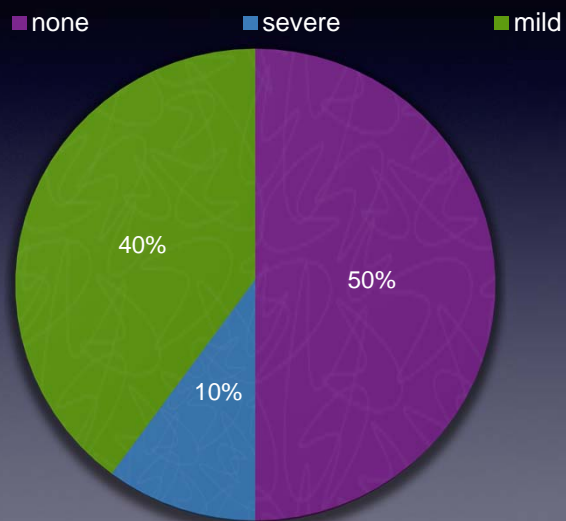


Cognitive Dysfunction

- Cognitive dysfunction correlates with number of lesions and lesion area on MRI, as well as brain atrophy. (black holes)
- Cognitive dysfunction can occur with any disease course.
- Cognitive dysfunction can occur at any time but is more common later in the disease.
- Depression and fatigue can worsen cognition.



Cognitive Dysfunction



Cognitive Deficits in MS

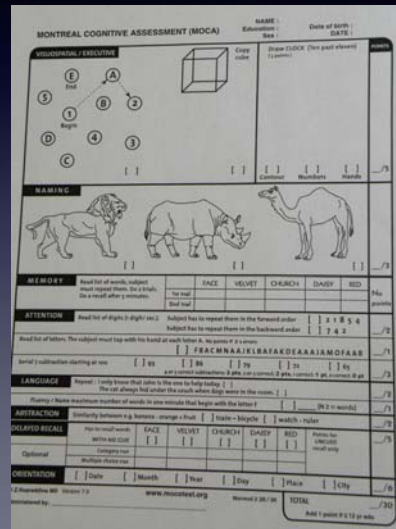
- Slowed speed of processing
- Memory
 - Working memory
 - Secondary memory
- Attention and concentration
 - Sustained attention
 - Complex or divided attention
- Verbal fluency
- Executive functions
 - Abstract reasoning and problem solving
- Visuo-spatial skills

Cognitive Assessment

- Battery of tests designed to assess areas of reported difficulties, as well as pre-existing and current strengths
- Clinical neuropsychologist, occupational therapist, and speech-language pathologist can provide testing
- Full test battery = 6-8 hours over two days by a NP
- Various self screening batteries available (e.g. MS Neuropsychological Screening Questionnaire)
- Minimal Assessment of Cognitive Function in MS (MACFIM)
- Brief International Cognitive Assessment for MS (BICAMS)

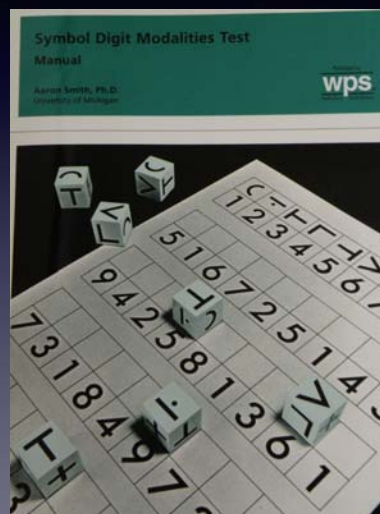
Montreal Cognitive Assessment

- Brief cognitive screen developed in 1996 to identify Mild Cognitive Impairment
- Assesses STM, executive function, visuospatial abilities, attention, language, and orientation
- Available for free download at www.mocatest.org



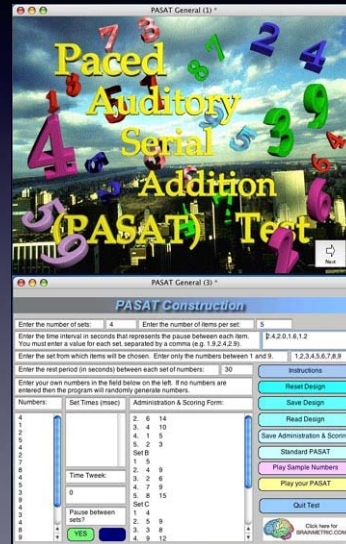
Symbol Digits Modalities Test

- Screening test for cognitive dysfunction
- Can be administered and scored in approximately 5 minutes
- Test subject substitutes a number for randomized geometric figures
- Can be given in written or oral form



Paced Auditory Serial Addition Test

- Frequently utilized in MS population
- A test of sustained attention
- Subjects listen to a series of numbers and then must add consecutive pairs of numbers
- Part of the Multiple Sclerosis Functional Composite (MSFC)



Cognitive Treatment

- Restorative approach
 - Attempts to restore impaired function through direct retraining (e.g. word searches, computer games, spacing, generation, testing)
- Compensatory approach
 - Tools and strategies to compensate for impaired function (ie. using a family calendar)
 - May be very effective in reducing impact of problems

Cognitive Compensatory Strategies

- Use computer program/organizer for all information (e.g. Outlook Express, PDA, Smart phones)
- Use small, dictating memory aides
- Utilize energy management to decrease impact of fatigue on cognition
- Schedule most difficult cognitive tasks when most alert
- Allow longer period of time for task completion
- Delegate tasks



Cognitive Compensatory Strategies (continued)

- Break down complex information into manageable “chunks”
- Utilize as many systems as possible to help retain information (e.g. vision, hearing, kinesthetic)
- Simplify — do one thing at a time
- Keep things organized and in the proper place
- Keep a family calendar to track *everyone’s* commitments
- Make “to do” lists and check them off daily
- Use exercise/activity logs



Visual Disorders in MS

- Optic neuritis
- Diplopia
- Blurred vision
- Internuclear ophthalmoplegia (INO)
- Nystagmus



Visual Disorders Symptoms

- Optic Neuritis
 - Pain behind eye with movement
 - Loss of vision in one eye
 - Blurred vision
 - Color blindness
 - Blind spots in visual field
 - Difficulty seeing low contrast
 - Difficulty seeing in bright light
 - Difficulty scanning



Visual Disorders Symptoms

- Internuclear ophthalmoplegia (INO)
 - When the patient's gaze is directed away from the side of the lesion, the ipsilateral (adducting) eye will not adduct and the contralateral (abducting) eye demonstrates horizontal nystagmus.
- Diplopia and blurred vision
- Nystagmus
 - Repetitive, jerky eye movements
 - Dizziness, oscillopsia, nausea, poor acuity

Visual Treatment

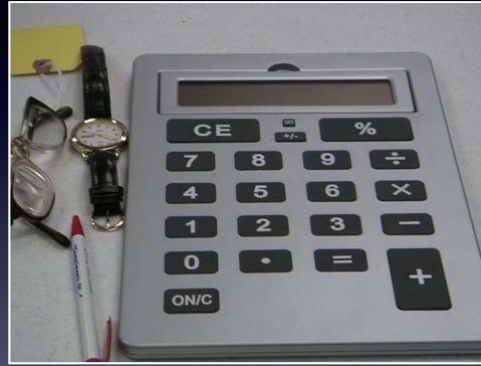
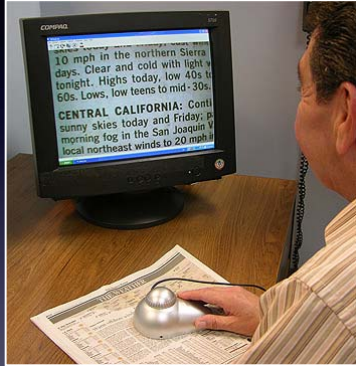
- High dose IV methylprednisolone
- Gabapentin for acquired nystagmus resulting in oscillopsia
- Ocular retraining of specific eye muscles that are weak
- Patching/partial occlusion
- Referral to a low vision specialist
- Referral for assistive technology evaluation

Visual Treatment for ADL/IADL Skills

- Provide good lighting in commonly used areas
- Outline steps and pathways with contrast markings
- Sunglasses
- Avoid night driving
- Non-glare screen on computer
- Use of templates (e.g. Checks)
- Use of contrast colors at place setting
- Marking clothing with tactile and colored cue



Visual Aids



- Large TV remote, kitchen timer, and talking calculator are a few of the many large or talking devices available.
- Screen readers and video magnifiers are widely used.

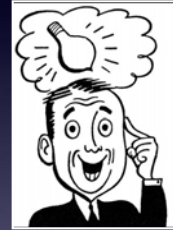
Visual Aids



- Better lighting, improved contrast, avoiding clutter and simple markers are helpful, as well as magnifiers and large print

When to Think about an OT Referral

- Upon MS diagnosis to educate and get baseline assessment data
- Establish home exercise programs
- For treatment of upper extremity
- To address visual/visual-perceptual deficits
- For assessment and treatment of potential cognitive deficits



When to Think about an OT Referral (continued)

- To increase safety and independence in ADL/IADL's
- Assess for adaptive equipment and home/work modifications
- Recommendations for return to work or disability
- Energy management techniques
- Assessment of driving ability





Transfer Aids

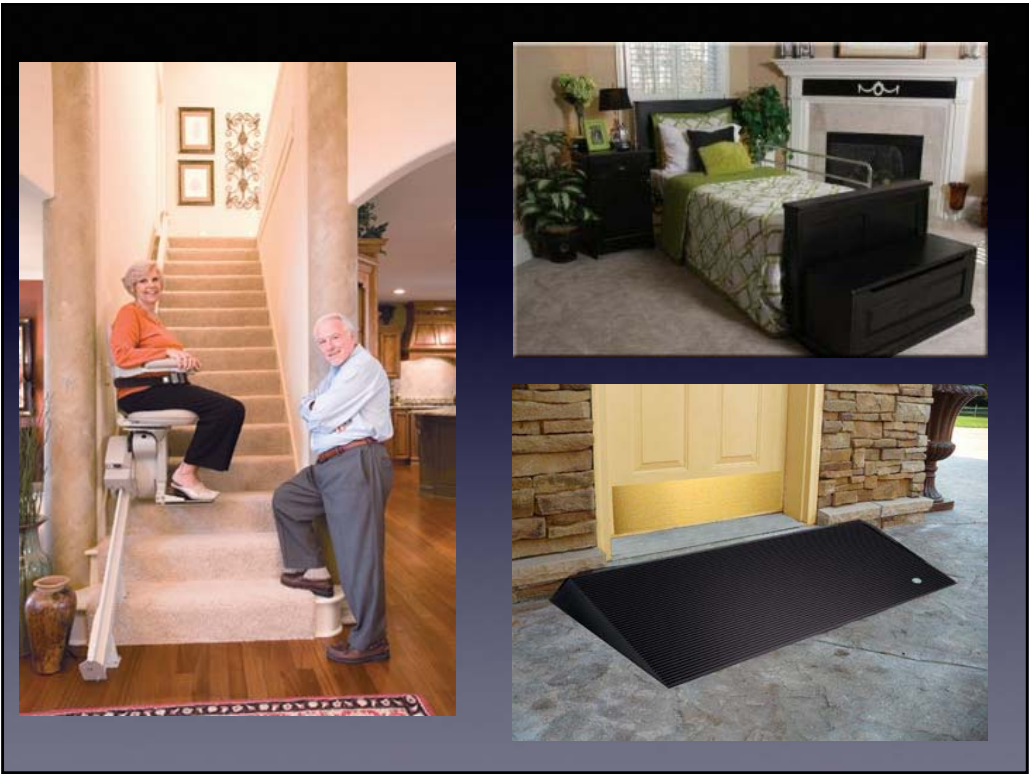


Bathroom Equipment



Home Modifications





Adaptive Driving



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