DEGENERATIVE DISEASES

PARKINSON’S DISEASE

- A degenerative disorder characterized by a decrease in dopamine production
- Unknown etiology
- Risk increases with age
- No laboratory or imaging studies can diagnose PD. CT or MRI can be used to rule out other neurodegenerative diseases
PARKINSON’S DISEASE

Clinical Presentation
- Majority of patients will first notice a resting tremor in the hands (aka pill rolling tremor) or feet; that disappears with movement or sleep
- Early in the disease process, patient may attribute symptoms to “old age”: balance disturbances, difficulty rolling over & rising out of bed, impairments with fine motor skills (writing, bathing, dressing)

PARKINSON’S DISEASE

Clinical Presentation continued
- Symptoms slowly progress and often include:
  - Sluggish movement
  - Difficulty with initiating and stopping movement
  - Festinating and shuffling gait
  - Bradykinesia
  - Poor posture
  - Dysphagia
  - Mask-like appearance with no facial expression

PARKINSON’S DISEASE

Treatment
- Medical management includes dopamine replacement therapy
- PT intermittently throughout the course of the disease
  - Maximize endurance, strength, functional mobility, family education, balance activities, gait training, stretching, trunk rotation, relaxation techniques, assistive device training, and respiratory function
MULTIPLE SCLEROSIS

Multiple Sclerosis

- Patches of demyelination (of the myelin sheaths that surround nerves within the brain and spinal cord) decreases the efficiency of nerve impulse transmission
- Etiology unknown
- Higher incidence in caucasians between 20 & 35 years old
- Twice as many women as men

http://www.youtube.com/watch?v=xuVY7w825rc
CATEGORIES of MS

- Relapsing-remitting MS
- Primary-progressive MS
- Secondary-progressive MS
- Progressive-relapsing MS

Multiple Sclerosis

- Initial **symptoms** can include:
  - Visual problems, paresthesias, sensory changes, clumsiness, weakness, ataxia, balance dysfunction, fatigue
- Clinical course usually consists of exacerbations & remissions

Multiple Sclerosis

- **Treatment**
  - Medical Intervention (meds)
  - Physical Therapy
    - Regulation of activity level, relaxation & energy conservation techniques, normalization of tone, balance activities, gait training, core stabilization & control, adaptive/assistive device training, education regarding safety
Study #1: Elliptical & MS

- 26 patients with MS completed 15 sessions over 6 weeks of elliptical training, 30 minutes each time…with the intensity being increased every 3-4 sessions.
- Results: significantly improved fatigue and quality of life in patients with MS
  - Huisinga et al (2011)

Study #2: Vestibular Rehab & MS

- 38 patients with MS assigned to one of 3 groups: vestibular rehab group (got standardized vestibular rehab consisting of upright postural control and eye movement exercises for 1-2 minutes for a total of 55 minutes), an exercise group (received bicycle endurance and stretching) and a control group (received usual medical care).
- All groups were measured using outcome measures for fatigue, balance, walking, dizziness and depression.
- Results: the vestibular rehab group had greater improvements in fatigue, balance, and disability due to dizziness as compared to the other 2 groups. The results changed minimally at the 4 week follow up.
  - Hebert et al (2011)
AMYOTROPHIC LATERAL SCLEROSIS

- Progressive degeneration of motor neurons in the brain and spinal cord
- A chronic, degenerative disease that produces both Upper and Lower motor neuron impairments
- Progression is rapid with death within 2-5 years (usually due to respiratory failure)
AMYOTROPHIC LATERAL SCLEROSIS

- Etiology: unknown
- More men than women
- Usually occurs between 40 to 70 years of age

ALS: Clinical Presentation

- Lower Motor Neuron Signs
  - Asymmetric muscle weakness, cramping, atrophy usually in the hands, muscle weakness, wasting, atrophy & fasciculations
  - Weakness follows a distal to proximal path

- Upper Motor Neuron Signs
  - Incoordination of movement, spasticity, clonus, Babinski present

PROGRESSION of ALS

- Phase I: Independent phase
  - Stage 1: mild weakness, clumsiness
  - Stage 2: evident weakness affecting certain muscle groups with decrease in ability to perform ADLs
  - Stage 3: more severe selective weakness in distal portions of extremities with beginning of respiratory compromise
PROGRESSION of ALS

- **Phase II Partially independent**
  - **Stage 4:** performs most ADL but tires easily, using a wheelchair for mobility, spasticity may be evident
  - **Stage 5:** functional performance of ADLs is compromised with significant weakness of LEs and moderate to severe weakness of UEs

- **Phase III Dependent phase**
  - **Stage 6:** maximal assistance is required with severe compromise of respiratory function

PHYSICAL THERAPY INTERVENTION

- Aerobic and endurance conditioning and reconditioning
- Balance, coordination and agility training
- Flexibility exercises
- Relaxation
- Neuromuscular education or reeducation
- Gait and locomotion training
- ADL training

http://www.youtube.com/watch?v=fwhXqmcpbhU

http://www.youtube.com/watch?v=BlYhxRz-xhw

http://www.youtube.com/watch?v=qmW2r5sHes&NR=1
Guillain-Barre Syndrome

- Exact etiology is unknown
- It is a temporary inflammation and demyelination of the peripheral nerves’ myelin sheaths
- Results in motor weakness in a distal to proximal progression, sensory impairment and possible respiratory paralysis

Patients will initially present with distal symmetrical motor weakness, mild distal sensory impairments, & transient parasthesias
- Weakness progresses towards the UE & head
- Muscle & respiratory paralysis, absence of DTR, & inability to speak or swallow can occur as well
- Level of disability usually peaks within 2-4 weeks after onset, followed by 2-4 week static period, and a gradual recovery that can take months to years
Guillain-Barre Syndrome

- Diagnosed through CSF sample & EMG will show abnormal & slowed nerve conduction

**Treatment**

- Medical management
- Physical Therapy
  - **ACUTE:** PROM, positioning, light exercise, limit overexertion & fatigue
  - As patient progresses: orthotic, W/C, AD prescription, exercise & endurance, family education, functional mobility & gait training, respiratory therapy, aquatics

**Additional Resources**

- [YouTube Video 1](http://www.youtube.com/watch?v=Y2BF34FYUI8&feature=related)
- [YouTube Video 2](http://www.youtube.com/watch?v=gZ5el_P7tWQ&feature=related)
- [YouTube Video 3](http://www.youtube.com/watch?v=bqmmvku3-wo&feature=related)

**Wrap up of Today’s Lecture**
References
