Rehabilitation: Role in Parkinson’s Disease

Abu A. Qutubuddin, M.D., MBBS.
Associate Director of Rehabilitation
Parkinson’s Disease Research, Education and Clinical Center (PADRECC)
Physical Medicine & Rehabilitation
VA Medical Center/VCU
Richmond, Virginia
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Objectives

- Describe the philosophy and goals of PM&R as a specialty practice of medicine
- Name at least two tools used in the assessment of motor symptoms, balance and gait in Parkinson’s disease
- Discuss the various roles of Rehabilitation professionals involved in the care of PD patients
- Make referrals to PM&R earlier (before functional disability) and acknowledge the importance of regular exercise for patients with PD
Exercise is medicine

- Exercise has been proven to
  - build a healthier heart, lungs, and muscles
  - boost metabolism
  - prevent diseases
  - reduce disability
  - *Healthier M I N D*
“What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?”
PM&R Team Members

- Speech Therapist
- Physiatrist
- Nurse
- Social Worker
- Recreational Therapist
- Psychologist
- Occupational Therapist
- Physical Therapist

Ref. 1
PM&R consultations:

- Recovery from injury
- Maximizing function
- Preventing long term health hazards
PM&R physician: Adding Quality to Life

- Match resources to patient needs
- Maximize patient’s function, self-sufficiency
- Balance quality and cost of care
- Team players - work well with PCP
Parkinson’s disease

- PD is a progressive neurodegenerative disorders characterized by:
  - A. Tremor
  - B. Rigidity
  - C. Akinesia
  - D. Postural Instability
Brain Regions Affected by Parkinson’s Disease

Motor Cortex

Globus pallidus

Thalamus

Striatum

Caudate Nucleus

Putamen

Substantia Nigra

Substantia Nigra (detail)

Pars Reticulata

Pars Compacta

Locus Ceruleus

Raphe Nuclei

Brainstem

Parkinson’s disease
Secondary manifestations:

- Depression
- Dementia
- Dysphasia
- Sialorrhea
- Urinary problems
### Secondary manifestations

#### 2nd Motor Symptoms
- Freezing
- Micrographia
- Mask-like expression
- Stooped posture
- Slurred speech
- Sexual dysfunction
- Cramping
- Drooling
- Akathisia

#### Non Motor Symptoms
- Loss of sense of smell
- Constipation
- REM behavior d/o
- Mood d/o
- Orthostatic hypotension
Management of PD

- Pharmacological.
- Non-pharmacological
  - Education
  - Support services
  - Rehabilitation
  - Nutrition
Education

- Proper understanding and education help to manage the disease well.

Ref. 2
PM&R Involvement

- A thorough physical examination.
- Special attention should be paid to the musculoskeletal system.
- Evaluation of gait and balance.
- Evaluation of pain.
- Set up the appropriate goal.
New research suggests that exercise may even provide neuroprotection – slowing the progression of Parkinson’s in the brain by safeguarding vulnerable nerve cells from damage and degeneration.
Basics of Rehabilitation

- Physical therapy (PT)
- Occupational therapy (OT)
- Recreational therapy (RT) and
- Speech and language therapy (SLT)

- One should work with these disciplines closely to overcome limitations and eventually attain their functional goals.
Rehabilitation of PD

- Key management of PD other than medications is rehabilitation.
- Three main areas:
  - Flexibility
  - Strength
  - Cardio respiratory endurance
Flexibility

- Effective and maximize the flexibility has 3 components:
  - Must achieve current available ROM.
  - Optimal frequency of stretching.
  - Holding time for stretching must be determined.
Flexibility exercises help stretch muscles, protect against injury and allow the maximum range of motion for joints.
Strength training

- Strength training is a vital part of a balanced exercise routine that includes aerobic activity and flexibility exercises.
Benefits of Strength training

- Builds muscles
- Burns fat
- Increases endurance, bone density & testosterone
- Teaches self-control, responsibility
Be Consistent!!!!

consistency = awareness
Cardiovascular exercise

- Promote improved capacity of the cardiovascular system. They must be administered at least twice weekly.

- The contraction of major muscle groups must be repeated often enough to elevate the heart rate to a target level determined during testing.
What Frequency?

- ACSM guidelines recommend that adults should stretch minimum of 2-3 days per week and ideally 5-7 days a week focusing on the areas of reduced ROM.

- There is no specific guidelines for PD patients.
Rational for Rehabilitation for PD

- Experts in the treatment of PD recommend rehab services as an addition to medical therapy.

- It makes sense that these services can prevent complications and either maintain or assist with function.
Rehabilitation

- PD patients often state that they “feel” or “function better” with a program of regular exercise.

- There are not very many studies done on Parkinson’s disease patients and regular exercise.
Assessment Tools

- Unified Parkinson's Disease Rating Scale (UPDRS) is the most commonly used scale in the clinical study of Parkinson's Disease.

- UPDRS is a rating scale used to follow the longitudinal course of Parkinson's disease.
Balance

- Postural instability is one of the grave symptoms of PD.
- Poor balance causes someone to falling, injury and wheel chair bound.
- As a PM&R specialist we have to be cognizant about this problem.
Balance tests

- Berg balance scale (BBS)
- Timed up and go (TUG)
- Ten meter walking test.
- Computerized dynamic posturography.
The Berg Balance Scale
- a widely used clinical test of a person's static and dynamic balance abilities.
- named after Katherine Berg, one of the developers.
- For functional balance tests, the BBS is generally considered to be the gold standard.
BBS interpretation of the result is:

- 0–20 wheelchair bound
- 21–40 walking with assistance
- 41–56 independent

Ref. 3
Computerized Dynamic Posturography (CDP)

- Unique assessment technique objectively quantify and differentiate among the wide variety of possible sensory, motor, and central adaptive impairments to balance control.
- Complementary to clinical tests designed to localize and categorize pathological mechanisms of balance disorders.
- Cannot diagnose pathology or site-of-lesion.
CDP Protocols

- Sensory Organization Test (SOT)
- Motor Control Test (MCT)
- Adaptation Test (ADT)
HAVE FUN

- Have fun. If you don’t enjoy it, you won’t stick with it.

- Do something you like. Dance, yoga, tai chi, cycling and strength exercises have all been shown to help with physical and cognitive symptoms of Parkinson’s.
Exercise

- Research shows that people stick with exercise when there is encouragement and an expectation to show up.
- Also exercising with a group most of the time has good success rate.
Rehabilitation Programs

- The programs evaluated in PD patient studies ranged from home-based, to OP PT or OT, or both, or speech therapy, to comprehensive inpatient programs.

- Results suggest benefits which includes exercise programs that focuses on improving ROM, endurance, balance, and gait.
Advantage of therapy

- One study noted that repetitive exercises directed at improving ROM, balance, fine motor dexterity, gait, and endurance 1 hour 3 times per week for 4 weeks significantly improved the ADL’s and motor functions but not tremor.

Rehabilitation

- It has been found that improvements in gait, tremor, motor coordination, and grip strength in an exercise program regardless of the place.

- Such a program could be more easily continued in a group format at a community gymnasium or other facility in a more cost-effective fashion, with the additional benefit of increasing socialization.
Speech and swallowing

- Therapy focused on voice and respiratory control, loudness, pitch variation, and control of rate of speech.
- Specific type of speech therapy might be important in terms of benefit and carryover.
- Study reported that intensive speech therapy 3½ to 4 hours per day of 2 weeks produced a positive effect.
Lee Silverman Voice Treatment: LSVT

- Intensive program of voice exercise
- Targets voice intensity, quality and variation—precisely the areas of difficulty for persons with PD.
- Series of voicing exercises taught to be aware of sensory feedback from the voice and self monitor voicing patterns and voice.
Lee Silverman Voice Treatment: LSVT

- Increased self-awareness allows for correction of errors and for faster progress toward the target.
- This program teaches the patient to “think LOUD”, and to focus their efforts on increasing voice volume.
- LSVT regimen 4 training sessions /week/1 month.
- Total of 16 sessions.
LSVT® Foundation

- LSVT® founder:
  - Lorraine Olson Ramig, Ph.D., CCC–SLP
  - Professor, University of Colorado–Boulder
  - Research Associate, Wilbur James Gould
  - Voice Research Center, Denver, Colorado
Speech Production Tasks

- Hierarchy activities:
  - Week 1: words
  - Week 2: Phrases
  - Week 3: Reading aloud
  - Week 4: Conversation
Why is the LSVT® Program Successful?

- “Loudness” functions as a single motor organizing theme which enhances overall speech

- Intensive mode of administration is essential to maintain optimum treatment results

- By incorporating sensory awareness training, the patient feels more comfortable using their new louder voice
Future Rehabilitation

- Due to changes in healthcare delivery it is unlikely that most PD patients will receive inpatient rehab.

- Continuation of exercise program on a basis of 2 to 3 times a week can be necessary to optimize and maintain gains realized in formal therapy sessions.
Summary

- 67 y/o male, PD >7.5yrs, well controlled.
- C/C: Freezing, dizziness mostly when stands up from sitting position.
- No orthostasis.
- Fear of falling, last fall 3 weeks with no real injury.
- Bilateral knee pain with ambulation for 3 years.
- Not on any home exercise program.
What do I do

- Quick sensory test.
- Manual muscle testing.
- Musculoskeletal examination.
- Berg Balance Scale.
- Gait evaluation.
My Guidelines

- Medication adjustments.
- Wait for 15-20 sec before step forward to walk after getting up from sitting position.
- Move the feet as if dragging it on the floor. This will allow the feet to loosen up and easy to start stepping forward.
- If needed use the straight cane for additional support.
- Strengthening exercise for quadriceps and gluteus muscles.
- Discuss healthy living, f/u 4 weeks.
Drooling

- Drooling for 6 months mostly at night. Tried atropine drops did not help.
- Consider Botox injections in the both parotid and sub-mandibular salivary glands.
- 15 to 20 U per site to start.
- F/U injections 6-8 months.
How to Locate a PM&R Physician

- Primary care physician
- Local medical society
- AAPMR
EDUCATION IS MY MEDICATION
References

1- Carne W, Cifu DX, Marcinko P, Pickett T, Baron M, Qutubuddin A, Calabrese V, Roberge P, Holloway K, Mutchler B: Efficacy of a multidisciplinary treatment program on 1 year outcomes of individuals with Parkinson’s disease. Neurorehabil @005;20:160-167


Thanks for listening!
Questions?