When to Call a Physical or Occupational Therapist in Huntington's Disease

Huntington's Disease Society of America

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Presenter Disclosures

Dr. Chris Lamb

The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No relationships to disclose or list





Outline of Presentation

- Role of Physical Therapists in HD
- Role of exercise in HD
- Stages of HD
- Get Moving: Balance and Exercise in HD
- Role of Occupational Therapists in HD



What is a Physical Therapist?

• A physical therapist is a highly educated, licensed health care professional that treats impairments and promotes function, mobility, and quality of life through examination, diagnosis, prognosis, and physical intervention.





Summary of Impairments and Activity Limitations Treated by Physical Therapists in Huntington's Disease (HD)

- Gait and balance training to prevent falls
- Aerobic capacity and strength training
- Joint range of motion
- Respiratory function
- Transfers/mobility
- Wheelchair prescription and training
- Relaxation
- Dystonia management
- Prevent of contractures
- Prescription of safety equipment
- Caregiver education
- Postural training
- Environmental alterations



When to Call a Physical Therapist During the Four Stages of HD

- Four stages consist of:
 - Pre-Clinical stage
 - Early stage
 - Middle stage
 - Late stage.



The human brain, showing the impact of HD on brain structure in the basal ganglia region of a person with HD (top) and a normal brain (bottom).

http://kobiljak.msu.edu



Levels of Evidence for the Research



Levels are 1-9 Level 1 is the best Level 9 is the weakest



SUNY Downstate Medical Center. Medical Research Library of Brooklyn. Evidence Based Medicine Course. A Guide to Research Methods: The Evidence

- Potter et al:
 - Level 8- Animal Research Model (Low level)
 - HD running mice demonstrated earlier motor symptom onset, but lifespan was the same
 - Study had limitations
 - Good take away: Too much exercise in the HD population could be counter-productive, but not enough evidence exists



- Zinzi et al.
 - Level 4 Case Series (Human Study)
 - Investigated the effects of intensive rehabilitation on individuals affected by HD in early to mid stage of the disease
 - Intensive program over 3 weeks; 8 hours per day
 - Lasted 2 years
 - Treatment included respiratory exercises, speech therapy, physical/occupational therapy, and cognitive exercises
 - Good takeaway: Intensive rehab resulted in improved movements and activities of daily living



- Quinn et al
 - Level 6 Case Study (Human Trial)
 - 49 year old male with HD participated in a 14 week exercise program
 - Consisted of exercises in balance, postural training, coordination, flexibility, and gait training.
 - Good take away: Patient's walking speed increased, balance scores improved, and disability score decreased with exercise



- Harrison et. al
 - Level 8 Animal Model
 - Mouse study testing the effects of exercise on motor and mental performance
 - Good take away: determined exercise improved walking and decreased the progression of cognitive dysfunction



- Kloos et al
 - Level 4 Case Series (Human Study)
 - Participants played the Dance Dance Revolution game with supervision and the handheld game without supervision
 - 45 minutes, two days per week for six weeks
 - Good takeaway: Patients were more likely to do exercise they enjoyed and had improved balance with the dancing



- Rottensteiner et al
 - Level 4 Case Series (Human Study)
 - Identical twins with different exercise habits
 - Sedentary twin had poor health
 - Active twin had more brain matter, especially in the area involved in motor control and coordination
 - Good take away: lifestyle can influence health despite your genes



Pre-Clinical Stage

- The stage at which the person has no motor or cognitive signs/symptoms.
- Goals of PT during this stage:
 - Aerobic capacity and strength training
 - Respiratory function
 - Relaxation
 - Caregiver education
 - Postural training
 - Balance training
 - Developing a exercise program focused on HD related impairments for the present and future



Early Stage

- The stage at which the person is either diagnosed with motor and/or cognitive signs and symptoms
- Very debatable on when the stage actually occurs
- Goals of PT during this stage:
 - Gait and balance training to prevent falls in conjunction with Tetrabenazine (Xenazine) if needed
 - Aerobic capacity and strength training
 - Relaxation
 - Prescription of safety equipment if needed
 - Caregiver education
 - Postural training
 - Stair training



Middle Stage

- Beginning of difficulty with walking, transfers, stair climbing, and falls
- Usually when the person is referred to Physical Therapy.
- Goals of PT during this stage:
 - Gait and balance training to prevent falls
 - Relaxation
 - Prescription of safety equipment and wheelchair if needed
 - Postural training



Middle Stage Cont.

- Goals of PT cont:
 - Stair training and environmental modifications if needed
 - Joint range of motion, dystonia management, prevention of contractures
 - Improve respiratory function
 - Transfers/mobility training
 - Caregiver education
 - Shorter bouts of exercise with more frequency to prevent stress overload.



The Evidence of Physical Therapy in HD

- Busse et al.
- Reviewed when patients were referred for PT
- Determined Physical Therapy is underutilized in the early stages
- Middle stage is when patients are referred to physical therapy
- Good take away: Start early!



Late Stage

- Stage at which the person has much difficulty getting out of bed, walking, and caring for themselves
- Goals of PT during this stage:
 - Fall prevention is the main goal- protecting the patient
 - Relaxation
 - Environmental modifications
 - Joint range of motion, dystonia management, prevention of contractures.
 - Improve respiratory function.
 - Transfers/mobility with caregiver education
 - Shorter bouts of exercise with more frequency to prevent stress overload.



Get Moving



3 Balance Systems

• Vestibular System: sensory receptors of the inner ear.

Somatosensory System: sensory information from the skin, muscles, and joints.

• Visual System: sensory receptors in the retina are called rods and cones









Canceling the Vestibular System

• Covering the ears.

Headphones.







Noise.

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Canceling the Somatosensory System

- Uneven surface.
- Moving surface.





Canceling the Visual System

• Eyes Closed.

• Blind fold.

•

Turn lights off.





Postural Training

- As HD progresses, postural muscles weaken.
- This includes trunk extensors, neck extensors, core muscles, hip extensors, knee extensors.
 *Poor posture is related to increased back pain.
- As the progression continues hands and feet muscles weaken



Good

Bad



Core and Postural Strengthening

Scapular Retraction



Wall Push-ups





Core and Postural Strengthening





Stretching/ Range of Motion





What is a Occupational Therapist?

 Assists patients in performing activities of all types, ranging from using a computer to caring for daily needs such as dressing, cooking, eating, and driving





Occupational Therapy

- OT services typically include
 - Customized treatment programs to improve one's ability to perform daily activities
 - Comprehensive home and job site evaluations with adaptation recommendations
 - Adaptive equipment recommendations and usage training
 - Guidance to family members and caregivers



Summary of Impairments and Activity Limitations Treated by Occupational Therapist in (HD)

- Personal hygiene
- Grooming
- Dressing
- Eating/drinking
- Toileting
- Transfers/mobility
- Driving assessment
- Promotion of safe home environment and environmental enrichments
- Provision of equipment and adaptive devices
- Memory training/task planning/ task execution/problem solving



Eating- Foam Grip





Dressing

• Zipper Ring



Button Hook





Dressing

Sock Aid



• Pant's Aid





Drinking

Cups to prevents spills
from possible chorea.





Toileting

• Shower and Commode Chair.



 Handrails placement in bathroom with toilet seat.





Transfers

• Hoyer Lift.



• Sliding Board.



Swivel Seat



Provision of Equipment and Adaptive Devices

- Adding weight cuffs to rollator to reduce fall risk from chorea
- Adding thera-band for visual aid







??Ask the Audience??

 U-Step Walker: has laser to help freezing gait in Parkinson's Disease. What about HD?







Home Environment Modifications

- Door handle aids
- Railings for stairs in home and steps to enter home
- Decrease slippery surfaces
- Remove clutter, floor rugs, et.
- Keep good lighting in all areas







Memory Training/Task Planning/Task Execution/Problem Solving with Apps

lumosity Challenge your brain with scientifically designed training Nemory Speed Attention Problem Solving Flexibility Let's Get Started + Already a member?

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Personal Zen: the app about staying positive and reducing stress and anxiety.



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Environment Enrichment Research

- Spires et al
 - Used environmental enrichment
 - HD mice were exposed to interesting objects placed in the home cage that were changed every 2 days.
 - Mice had delays in motor symptoms, increased brain weight, and rescue of specific protein deficits.
 - Good take away: Exposure to different environments and senses can be valuable



Resources

- HDSA PLANO SUPPORT GROUP-
 - 6200 W. Park Road, Magnolia Room, Plano, TX⁴
 - Susan Plano: <u>susanhdsa@gmail.com</u>, 972-740-7500
- GREATER NORTH TEXAS CHAPTER
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- MADHAVI THOMAS, MD
 - 2004 Bedford Road, Bedford, TX 76021
 - North Texas Movement Disorders Institute (Main Office), Baylor Movement Disorders Center Tuesdays Only)
 - 214-432-7549
- U-Step Walker http://www.ustep.com/walker.htm



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