Huntington's Disease Society of America

Physical Therapy in Huntington's Disease

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Huntington's Disease Society of America

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HDSA encourages all attendees to consult with their primary care provider, neurologist or other healthcare provider about any advice, exercise, medication, treatment, nutritional supplement or regimen that may have been mentioned as part of any presentation.

Presenter Disclosures

Dr. Meredith DeFranco

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 for Today

- Who am I and Where did I come from?
- The UF CMDNR
- Physical Therapy 101
- Evidence for PT in HD
- Guess the equipment!
- Technology at your fingertips
- Exercises

Meredith DeFranco, PT, DPT

- Bachelors of Science in Exercise Physiology University of Florida 2006

- Doctorate of Physical Therapy Duke University 2009

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UF | Center for Movement Disorders and Neurorestoration

The Center for Movement Disorders and Neurorestoration

- Team Approach
- Research
- Specialty Clinics
  - Parkinson's Disease, Muscular Dystrophy, Ataxia, Atypical Parkinson's Disease, Tourette's/Tics, Dystonia, Huntington's Disease
- Deep Brain Stimulation Program

PHYSICAL THERAPY

What is Physical Therapy?

- The treatment of physical dysfunction or injury through the use of therapeutic exercise, functional training, and the application of modalities.
- The aim is to facilitate and maintain quality of life

Goal of PT in HD

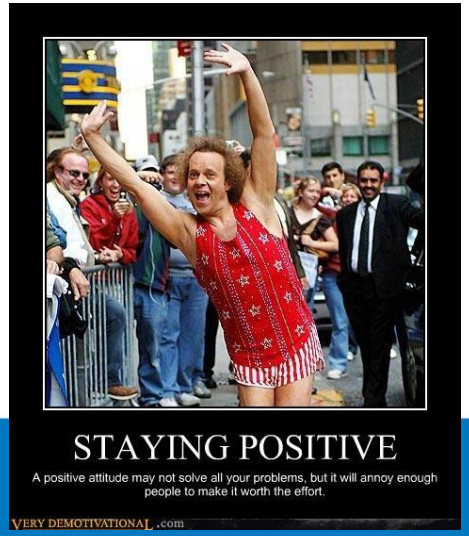
- Enhance fitness and wellness
- Strengthen
- Maintain respiratory capacity
- Prescribe and fit assistive devices
- Stabilize gait and balance
- Educate and support caregivers
- Establish and guide home exercise programs

The role of PT in Huntington's Disease depends of the stage of the disease!

Early Stage

- Improve fitness
- Strengthening
- Balance
- Gait
- Core stability
  - Maintain respiratory system!
  - Posture

- PT outlines exercise program
  - Home program
  - Gym program
  - Less duration, more frequency to avoid fatigue



Mid Stage

- Keep mobile
- Maintain function & quality of life
- Promote relaxation strategies
- Safety with ambulation

- Reinforce awareness
- Functional training
  - Transfers
  - Caregiver training
  - Equipment

Late Stage

- Protect the patient
- Promote Comfort
- Prevent falls
- Alter the patient's environment
- Establish a routine

- Caregiver support
- Respite Care

The Evidence

Busse M, Khalil H, Quinn L, Rosser A. *Physical Therapy Intervention for People with Huntington's Disease*. Physical Therapy 2008; 88: 820-831.

- 118 questionnaires answered by Neuro PTs
  - 49 treated HD patients
  - 15.3 years of experience
- HD patients are not referred in early stages
- PT treatment of HD should be tailored to disease stage
- Key treatment goal should be fall management and prevention of mobility decline
- PT's must address: depression, lack of motivation, and change in cognition to be successful

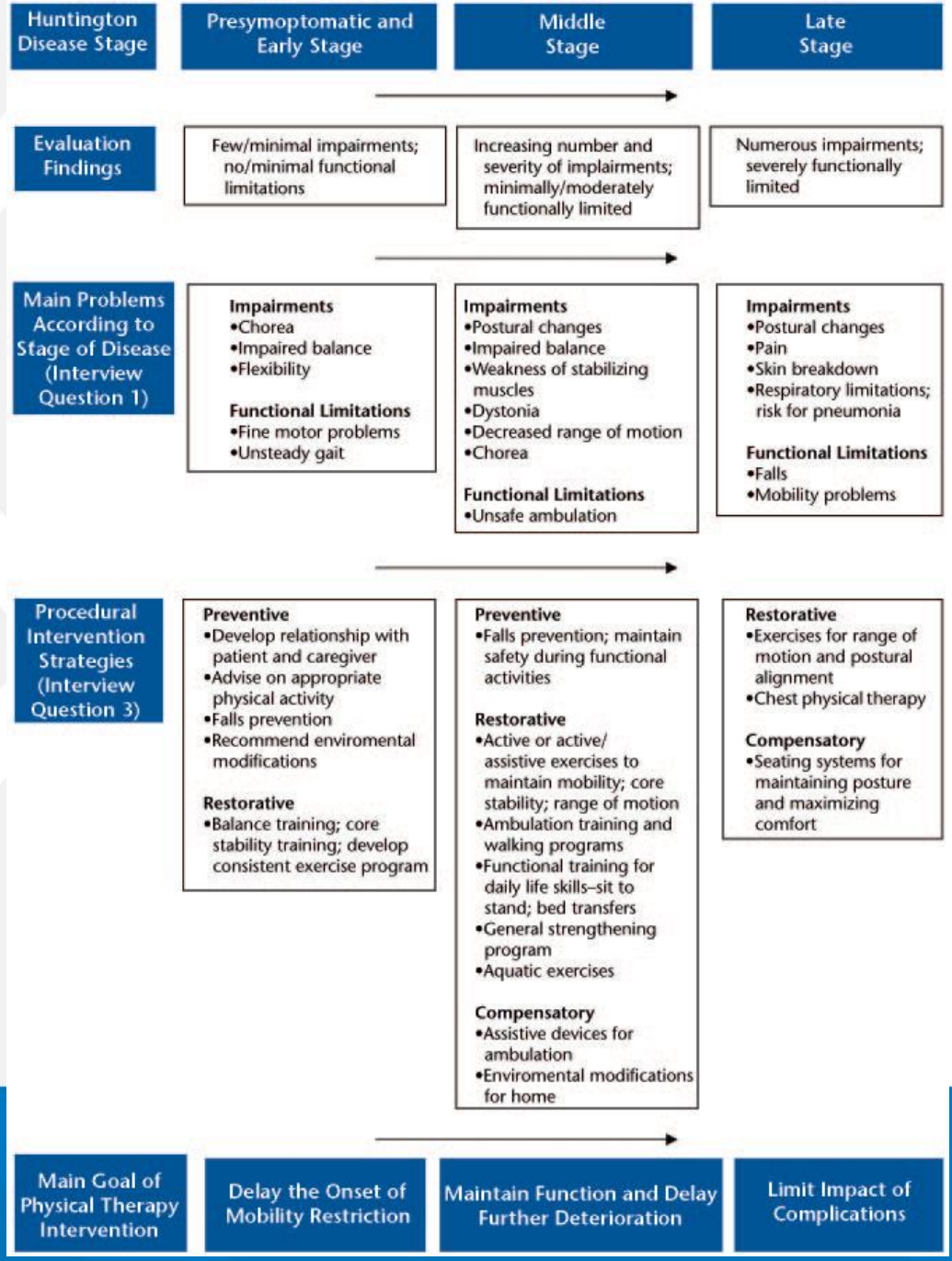


Figure 2.
Conceptual framework for physical therapy intervention in Huntington disease. Modified and reprinted with permission of Lippincott Williams & Wilkins from: Dal Bello-Haas VD. A framework for rehabilitation of neurodegenerative diseases: planning care and maximizing quality of life. *Neurol Rep.* 2002;26:115–129.

Zinzi P, Salmaso D, De Grandis R, et al. *Effects of an intensive rehabilitation programme on patients with Huntington's disease: a pilot study.* Clin Rehabil. 2007;21: 603– 613.

- 40 HD patients
- 3 weeks intensive rehab 3x per year
- 8 hours per day 5x days; 4 hours one weekend day
- Individual & group exercises
- PT, OT, speech therapy, respiratory exercises, & cognitive rehab

- Outcomes: 11 patients finished 2 year study
  - Improved motor & cognitive performance
  - Decreased depression
  - Maintained benefits for 2 years they were tracked

Kloos, Anne D. *The Impact of Different Types of Assistive Devices on Gait Measures and Safety in Huntington's Disease.* Plos 1, 2012

- 21 HD Subjects
- Measured under 7 different conditions:
  - No AD, cane, a weighted cane, standard walker, 2, 3, and 4 wheeled walker
  - Timed, # of falls/stumbles recorded
  - Figure 8 and obstacles navigated

- Outcomes: 4 wheeled walker most effective AD
  - Highest velocity and stride length
  - Decreased fall risk

Helpful adaptations

- Add weight to manage chorea

- Add visual cue to assist with akinesia

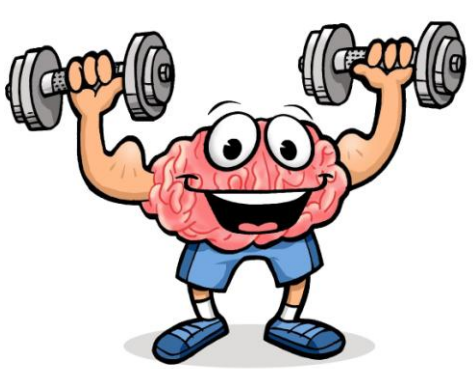
Renoir T, Chevarin C, Lanfumey-Mongredien L, Hannan AJ. *Effect of enhanced voluntary physical exercise on brain levels of monoamines in Huntington disease mice.* PLOS Currents Huntington Disease. 2011 Nov 4

Wood NI, Glynn D, Morton AJ. *"Brain Training improves cognitive performance and survival in transgenic mouse model of Huntington's Disease.* Neurobiol Dis. 2011 Jun;42(3):427-37.

- Physical activity decreases depressive affect
- Environmental enrichment
  - Increases physical activity
  - Decreases decline in cognition, mood, and motor deficits

- ***EXERCISE IS NEUROPROTECTIVE!**

Khalil 2012 "*Adherence to Use of a Home-Based Exercise DVD in People With Huntington Disease: Participants' Perspectives*"



HOME EXERCISE PROGRAMS

Example: DVD of home exercises for HD

Facilitators

- Cues
  - *Visual and verbal cues "make it easy to do"*
- Improved confidence
  - *"This program just helped because I felt that I am doing the right thing in the right way"*
- Weekly Phone calls
- Home Visit

Barriers

- Physical
  - *"exercises too hard"*
- Cognitive
  - "*DVD difficult to understand*"
- Lack of Motivation
  - *"difficult to get myself into it"*

WHAT IS THE KEY TO SUCCESS OF A HOME EXERCISE PROGRAM?

CAREGIVER INVOLVEMENT!

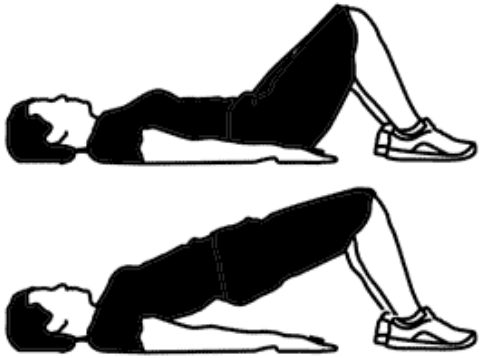
*"I am happy to help my loved one exercise, but the **chorea** makes it difficult….what exercises can we perform successfully?"*

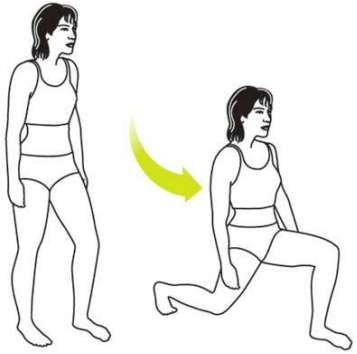
Closed Chain vs. Open Chain Exercises

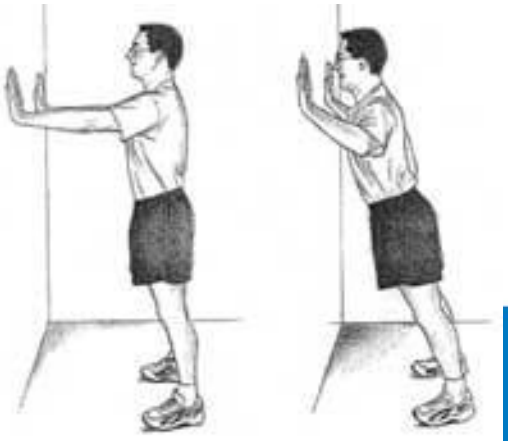
- Open Chain
  - Hand or foot are free to move in space
  - Target specific muscles
  - Weight added distally
  - Single-joint movements
- Closed Chain
  - Hand or foot are FIXED in space and cannot move
  - Safer
  - More functional
  - Compound movements
  - Involve more than one muscle group

Closed Chain Exercises for HD patients

- Improved motor control
- Decrease chorea through weight bearing
- Examples
  - Push-ups
  - Lunges
  - Bridges
  - Squats

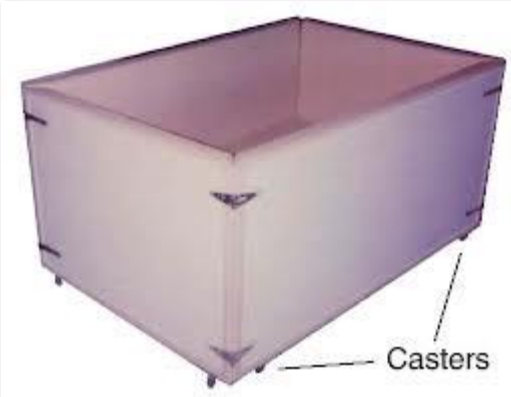






Guess the Adaptive Equipment!

1) Jacuzzi Chair
2) Chaise Lounge
3) Hot Seat
4) Tub Bench



1) Craig Bed
2) Pack & Play
3) Spouse time out
4) Privacy bed

1) Styling tools
2) Bad breath eliminator
3) Hair curler
4) Foam Grip

1) Tight pants
2) Zipper ring
3) Pocket Change
4) Hook a big one!

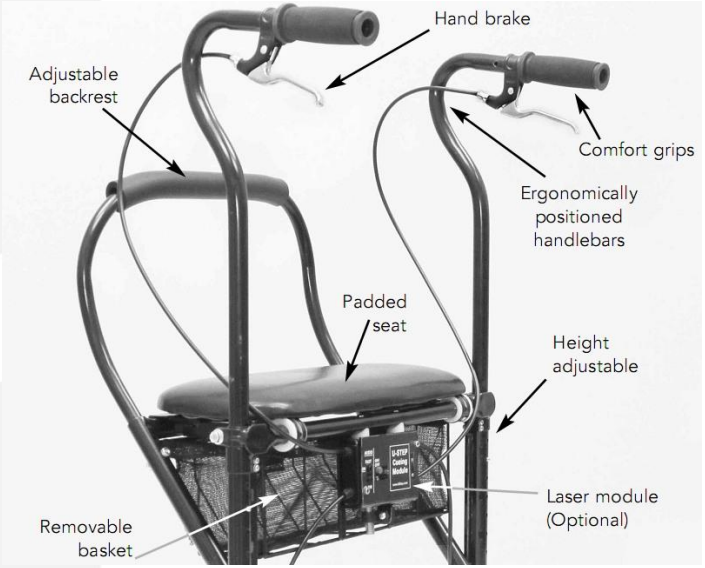
1) Fly Away
2) Eject-a-spouse
3) Rock & Roll
4) Lift Chair

1) Air Cast
2) Arm extender
3) Rain preventer
4) Trendy sleeve

1) Shower & commode chair
2) Easy Glider
3) Sun Tanner
4) Lazy-Boy

1) Twist & Shout
2) Round-a-bout
3) Swivel Seat
4) Scoot Master

1) Lawn Mower
2) Shopping Cart
3) U Step Walker
4) Rolling Purse


Hand brake
Adjustable backrest
Comfort grips
Ergonomically positioned handlebars
Padded seat
Height adjustable
Laser module (Optional)
Removable basket

Technology

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Gaming Systems

- Nintendo Wii

- X Box Kinect

The Breakdown

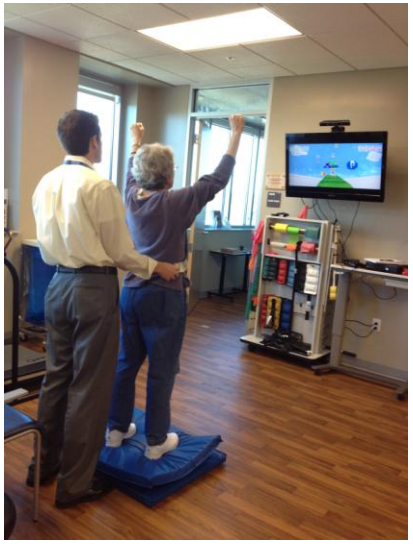
- Wii
  - Cost: $160
    - “Fit board”: ~$100
  - Requires use of remote control
  - Visual feedback
  - Up to four players at once with split screens
- X Box with Kinect
  - Cost: ~$300
  - Your BODY is the remote control
  - Real time visual feedback of body in space
  - All players can play at once on same screen

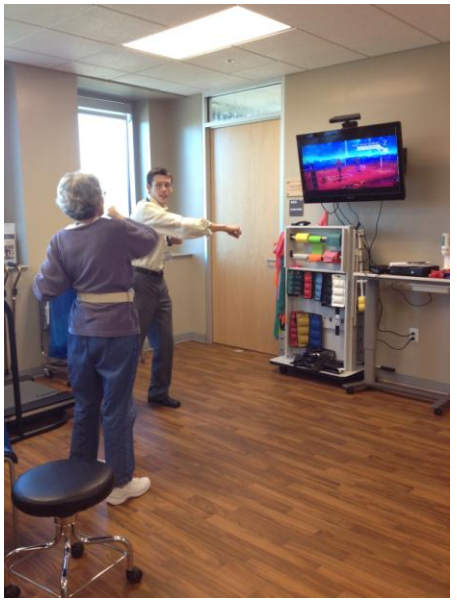
The Evidence

Use of the Xbox Kinect Virtual Gaming System to improve gait, postural control and cognition in a patient with Progressive Supranuclear Palsy: A Case Report. Bryant Seamon, DPT 2012 (not yet published)

The Feasibility and Effects of Training with the XBOX Kinect on Dual Tasking and Balance in a patient with Parkinson's Disease. Melissa Van Rees, 2012 (not yet published)

Saposnik G, Levin M, SORCan Working Group. *Virtual reality in stroke rehabilitation: a meta-analysis and implications for clinicians.* Stroke 2011;42:1380–6.

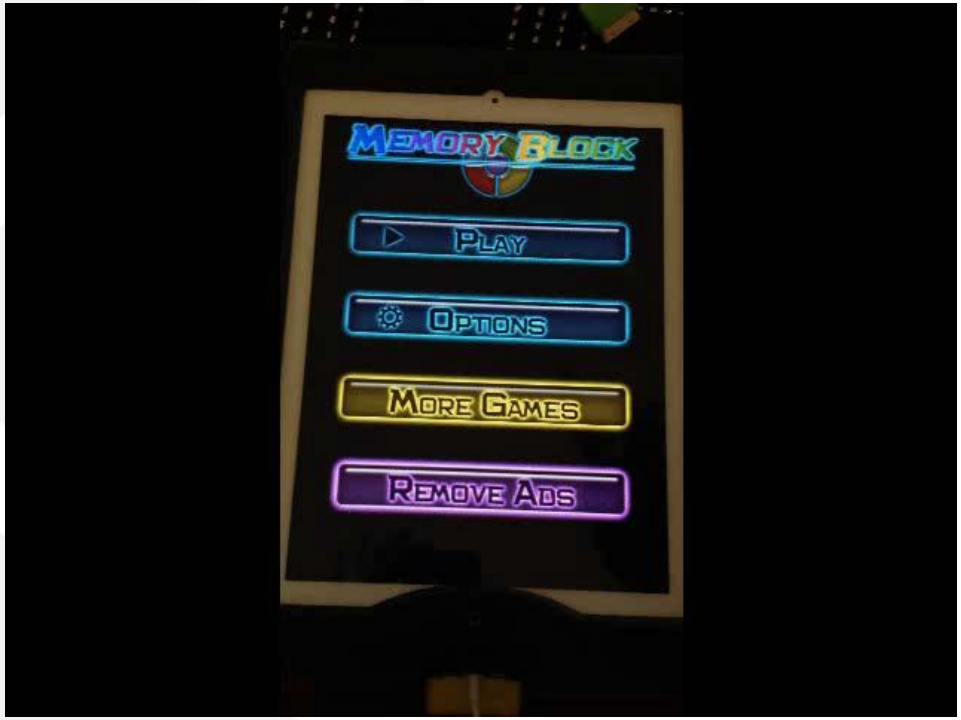




Videos

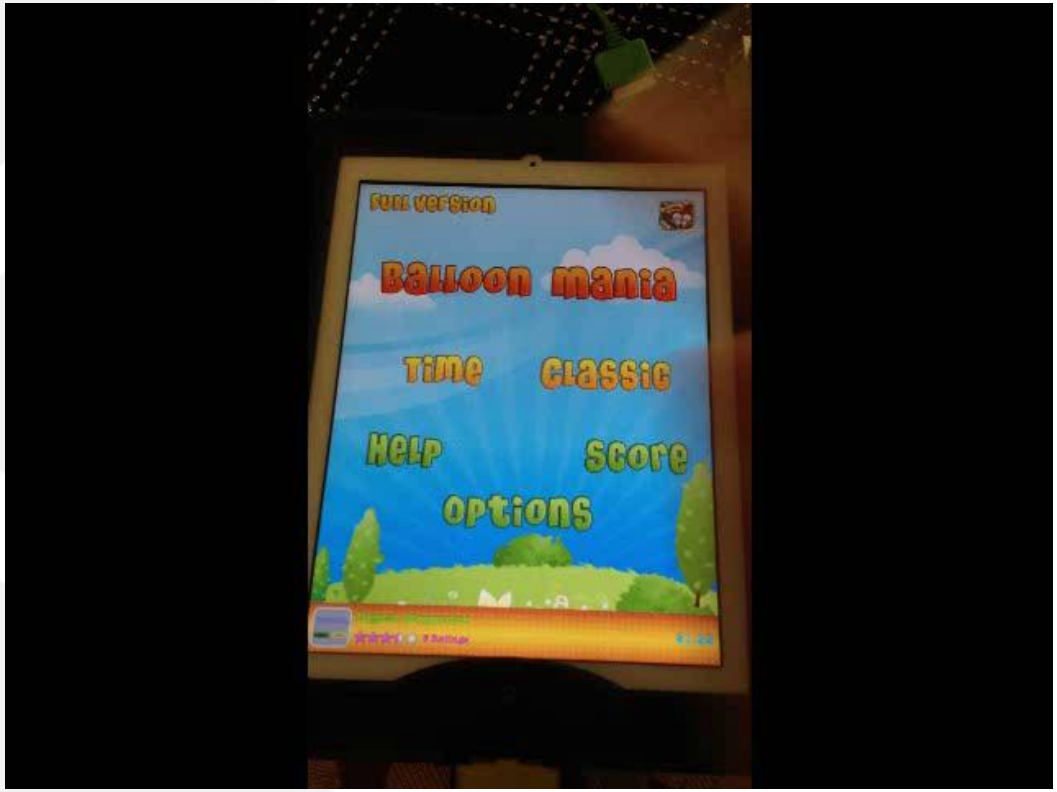
Smart Phone and Tablet Applications

Brain/Memory



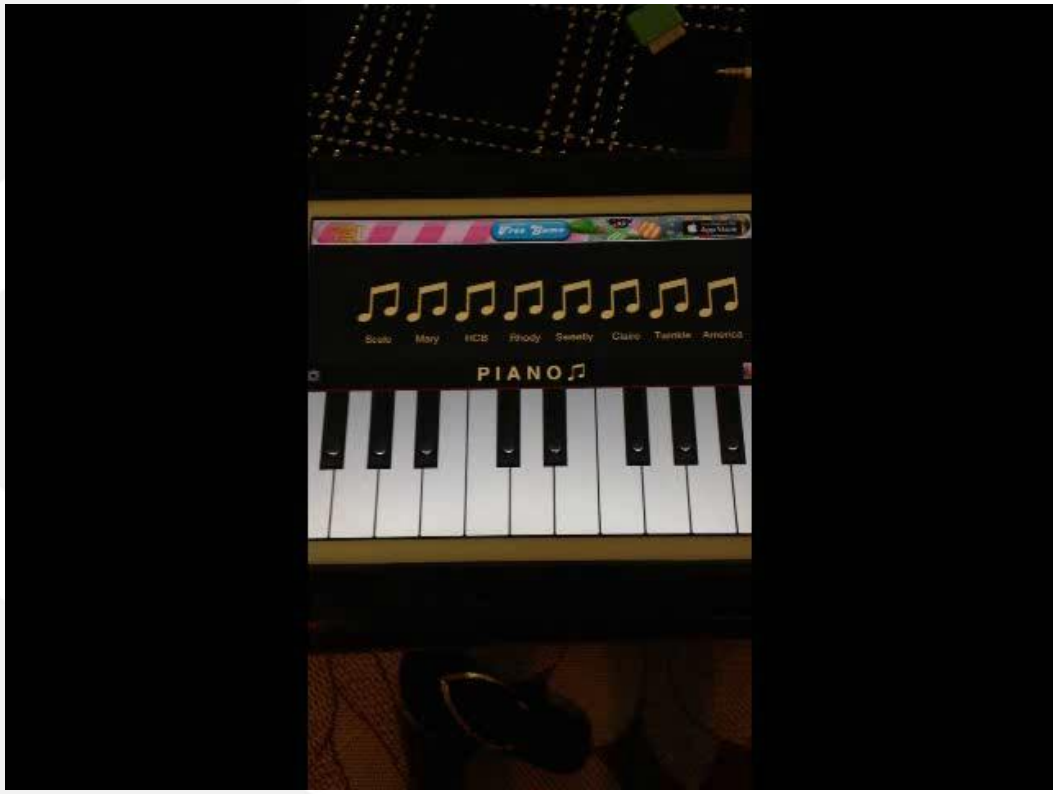
Balance Apps

Coordination App

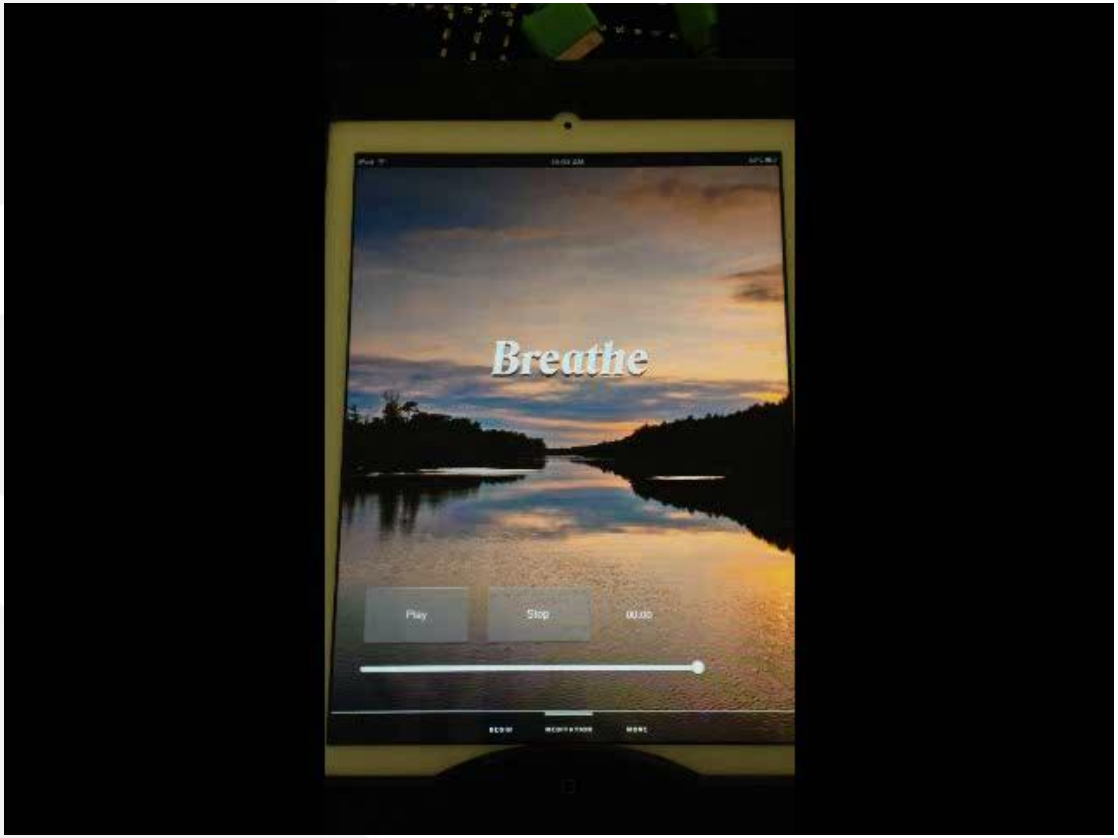


Visual Tracking

Musical Instrument



Relaxation Apps



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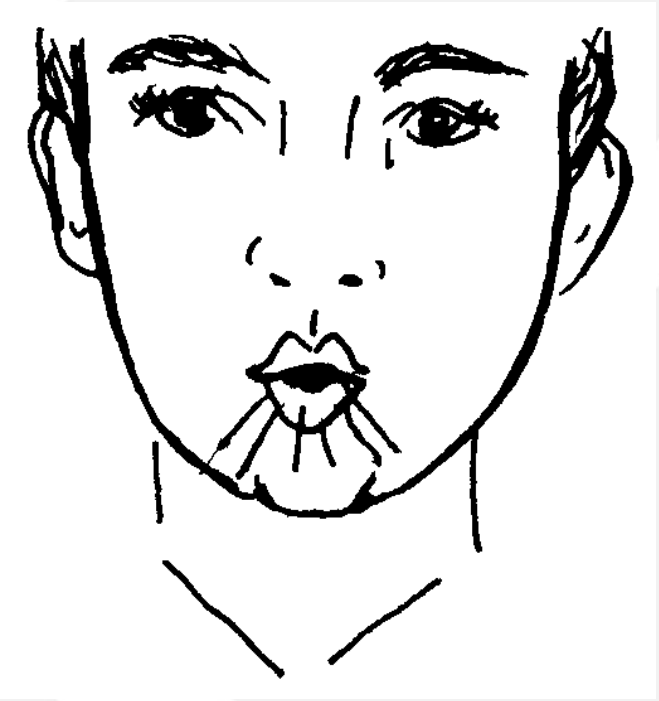
LET'S BOOGIE!

Respiratory Exercises

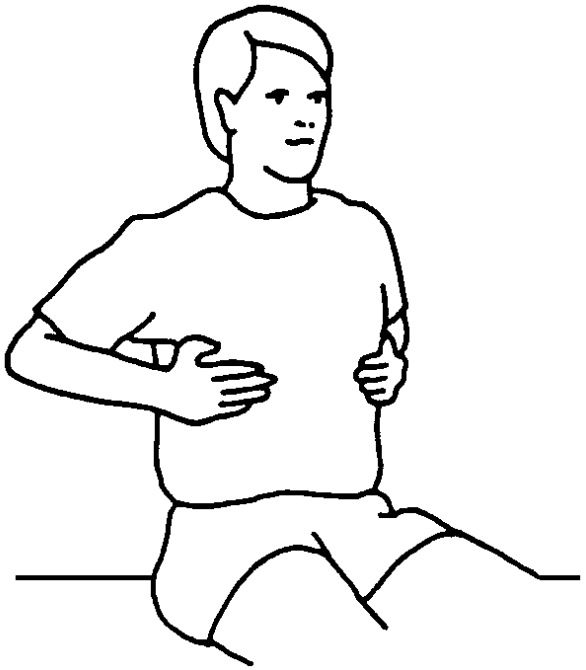
- Increase the efficiency of breathing
- Increase the efficiency of coughing
- Face & mouth muscles
  - Swallowing
  - Chewing
  - Eating
- Prevention of lung infections
- Start practicing EARLY!



Pursed Lip Breathing

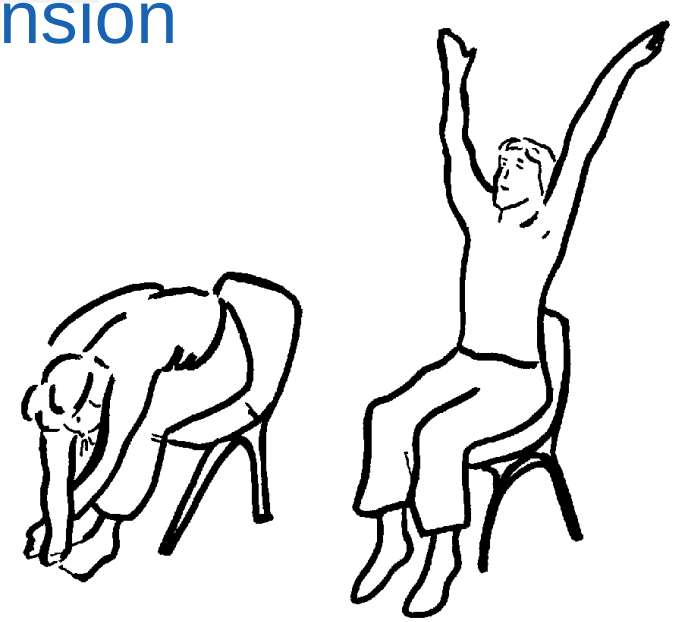
Take a deep breath in your nose with your mouth closed. When exhaling, purse your lips as if you were blowing out a candle. Do not force the air out or puff out your cheeks. Make your exhalation twice as long as the inhalation.

Diaphragmatic Breathing



Sit with your hands over your rib cage as shown in the drawing. Inhale slowly, using the part of the lungs beneath your hands; then exhale, gently pressing in with your hands. Do this exercise slowly and smoothly.

Trunk Flexion & Extension

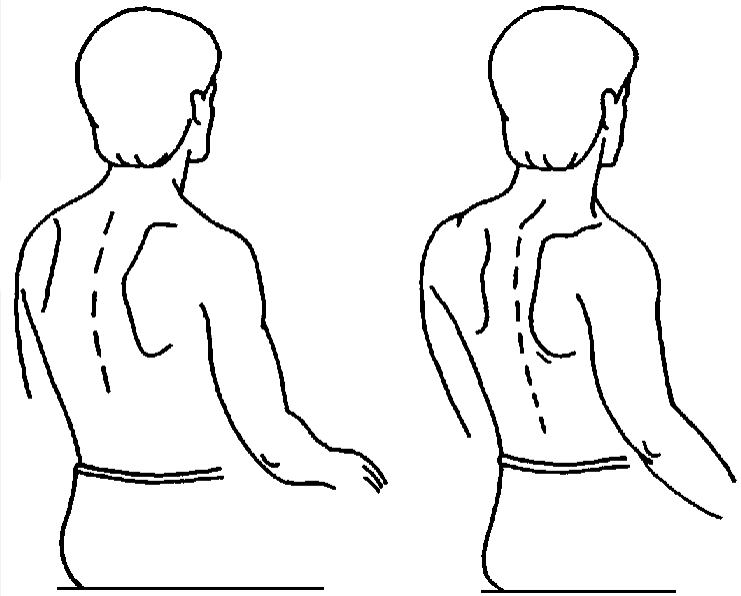


From a sitting position, exhale and bend forward to touch the floor. Inhale as you lean back and raise your arms up and out to a 'V' above your head.

Chin Tuck

While sitting, look straight ahead and relax your neck. Now tuck your chin, pressing your fingertips against your chin, as in the drawing. Do not allow your chin to drop to your chest or your head to tilt back. Hold for 5 seconds and relax.

Scapular Retraction

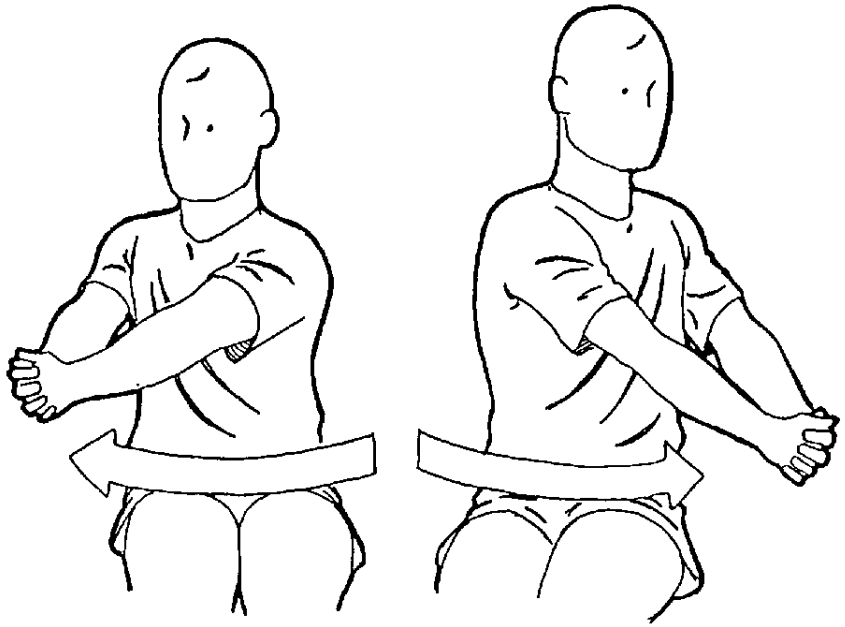


Sit straight in a firm chair, with your arms by your sides, elbows bent at a right angle. Squeeze your shoulder blades together, hold for 5 seconds, then relax.

Thoracic Extension over Chair back

Sit on a regular chair with low back rest and feet on a stool. Clasp your hands behind your head and rock backward over the top of the backrest.

Trunk Rotation



Interlocking fingers and sitting straight in a chair, turn body toward the left as if your were going to look over your left shoulder. Stop when you get to midline. Turn body toward the right as if your were going to look over your right shoulder.

What Questions do YOU have?

Resources

- UF CMDNR website: http://mdc.mbi.ufl.edu/
- http://www.ustep.com/
  - For U-step and Laser cane
- http://www.usmedicalsupplies.com/Lift-Chairs.htm?gclid=CJHBpPzIi7cCFUTd4AodbzMAEg
  - For lift chair
- http://www.seatingisbelieving.com/condition/huntingtons
  - For wheelchair, shower/commode chair
- Huntington's Disease Family Guide Series: PT/OT HDSA

Articles presented

- Busse M, Khalil H, Quinn L, Rosser A. Physical Therapy Intervention for People with Huntington's Disease. Physical Therapy 2008; 88: 820-831.
- Khalil 2012 "*Adherence to Use of a Home-Based Exercise DVD in People With Huntington Disease: Participants' Perspectives"*
- Kloos, Anne D. *The Impact of Different Types of Assistive Devices on Gait Measures and Safety in Huntington's Disease.* Plos 1, 2012
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- Zinzi P, Salmaso D, De Grandis R, et al. *Effects of an intensive rehabilitation programme on patients with Huntington's disease: a pilot study.* Clin Rehabil. 2007;21: 603– 613.

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