

Table Tennis as form of rehabilitation for people living with neurodegenerative conditions.

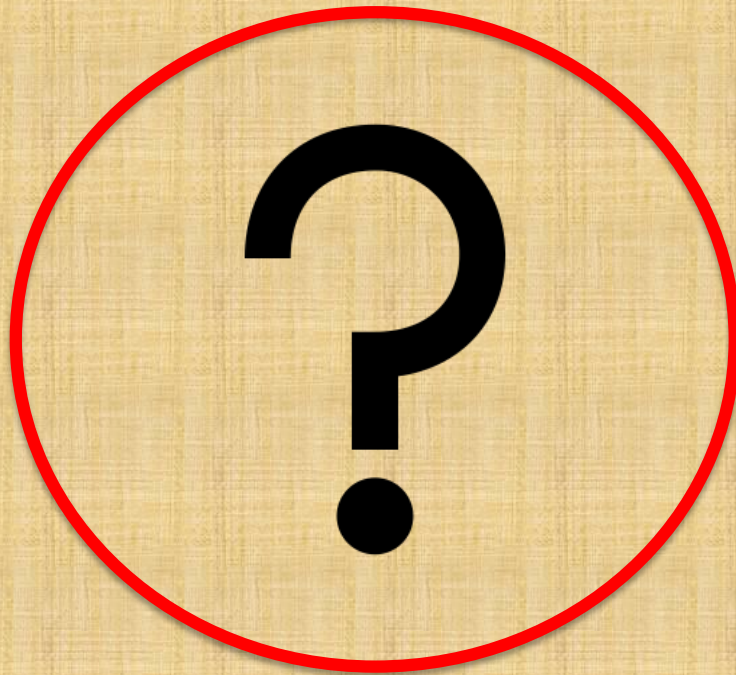
Antonino Barbera, MD

- Clinical Professor, Ob-Gyn, School of Medicine, Anschutz Medical Campus
- Movement Disorders Center, School of Medicine, Anschutz Medical Campus, Member
- International Parkinson and Movement Disorder Society, Member

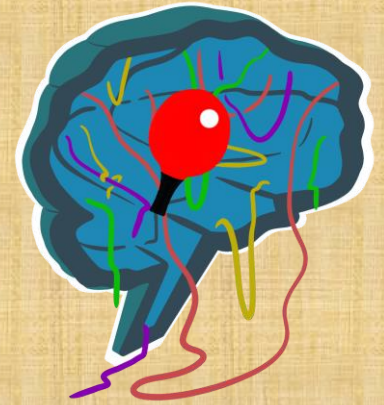
Colorado Springs, CO
May 4, 2024



YMCA OF THE PIKES PEAK REGION



NeuroPong™
Program



COLORADO PARKINSON FOUNDATION &
COLORADO SPRINGS PARKINSON'S SUPPORT GROUP

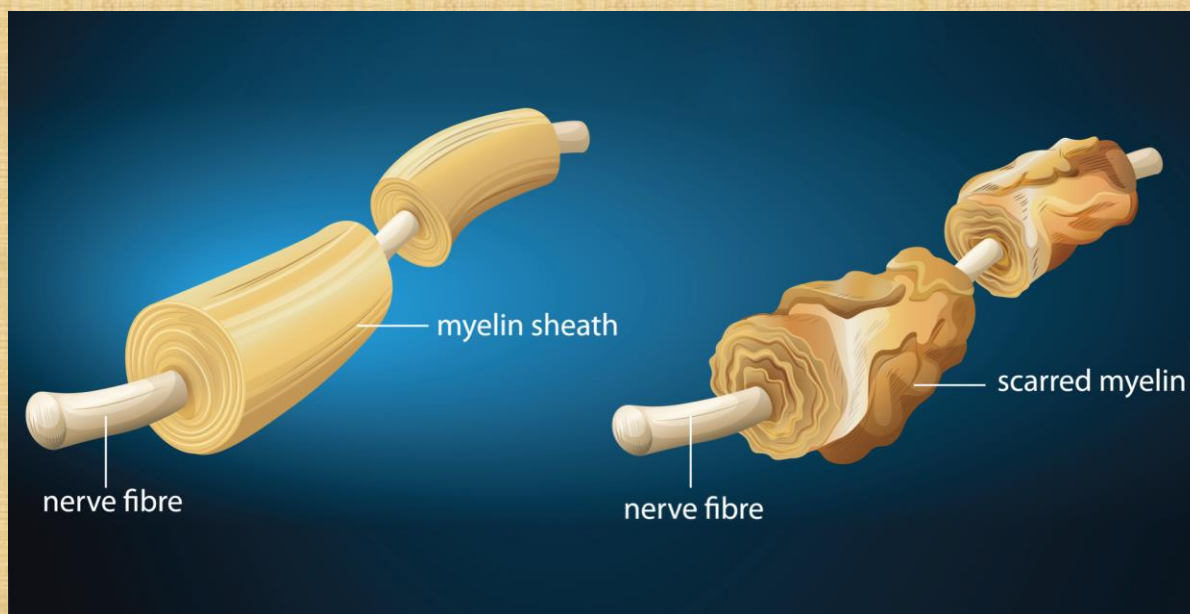
Antonio Barbera





Multiple Sclerosis (MS)

Multiple Sclerosis (MS) is a disease of central nervous system secondary to a damages of the **myelin**, a protective layer of our nerves fibers that acts like the insulation of an electrical wire. As a result there is a interruption of communications signals, to and from the brain, responsible of the unpredictable symptoms.



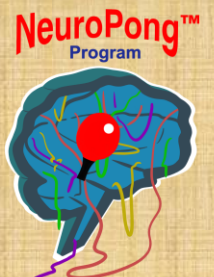
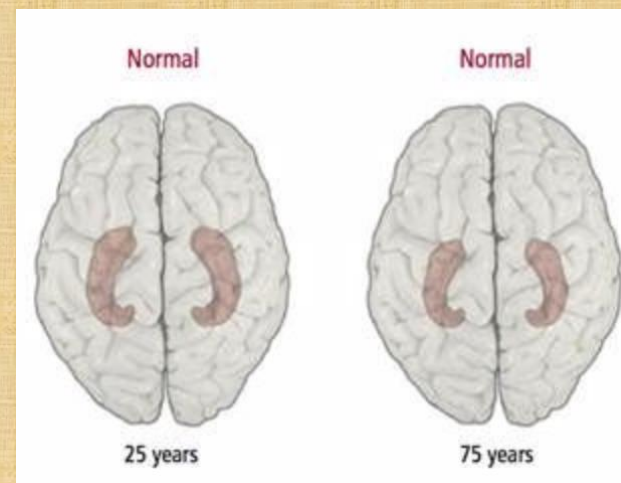
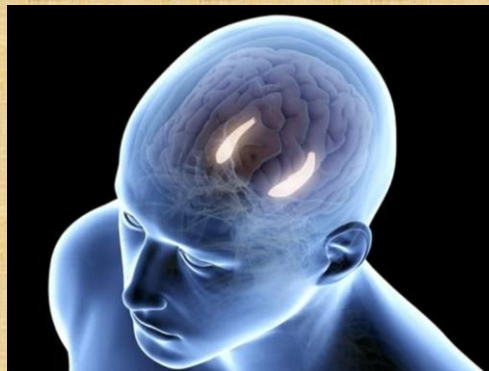
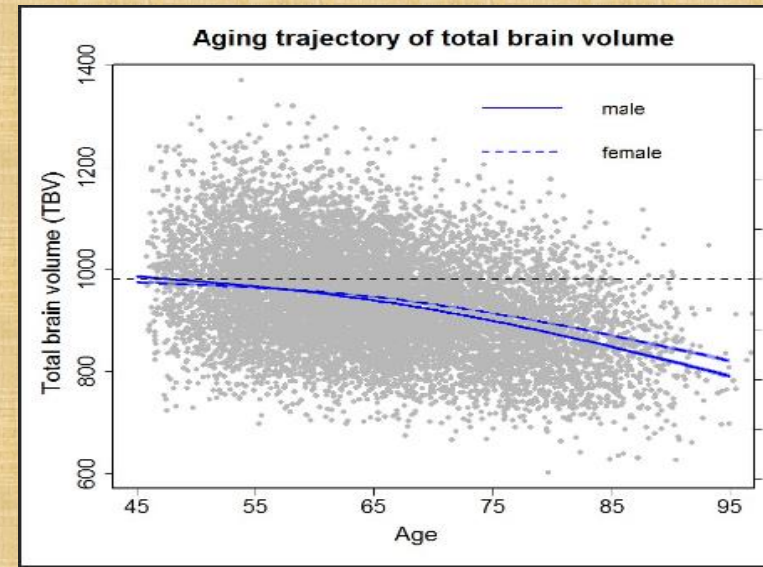
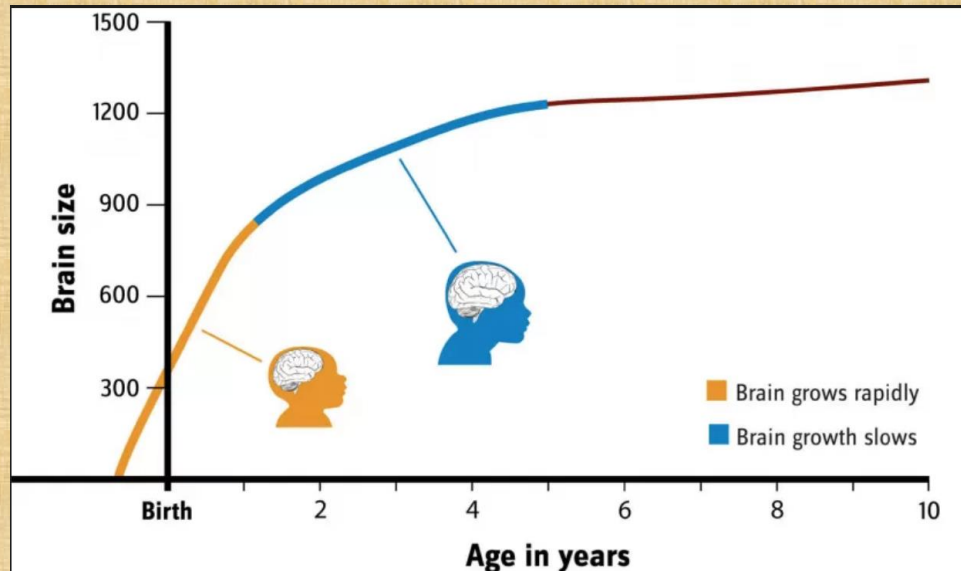


MS Hug and ... Table Tennis



Brain Aging

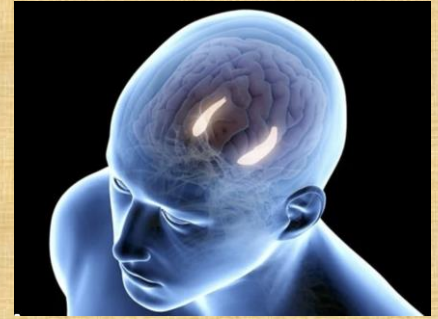
- 30 yo: 0.2%/year
- >70 yo: 0.5%/year





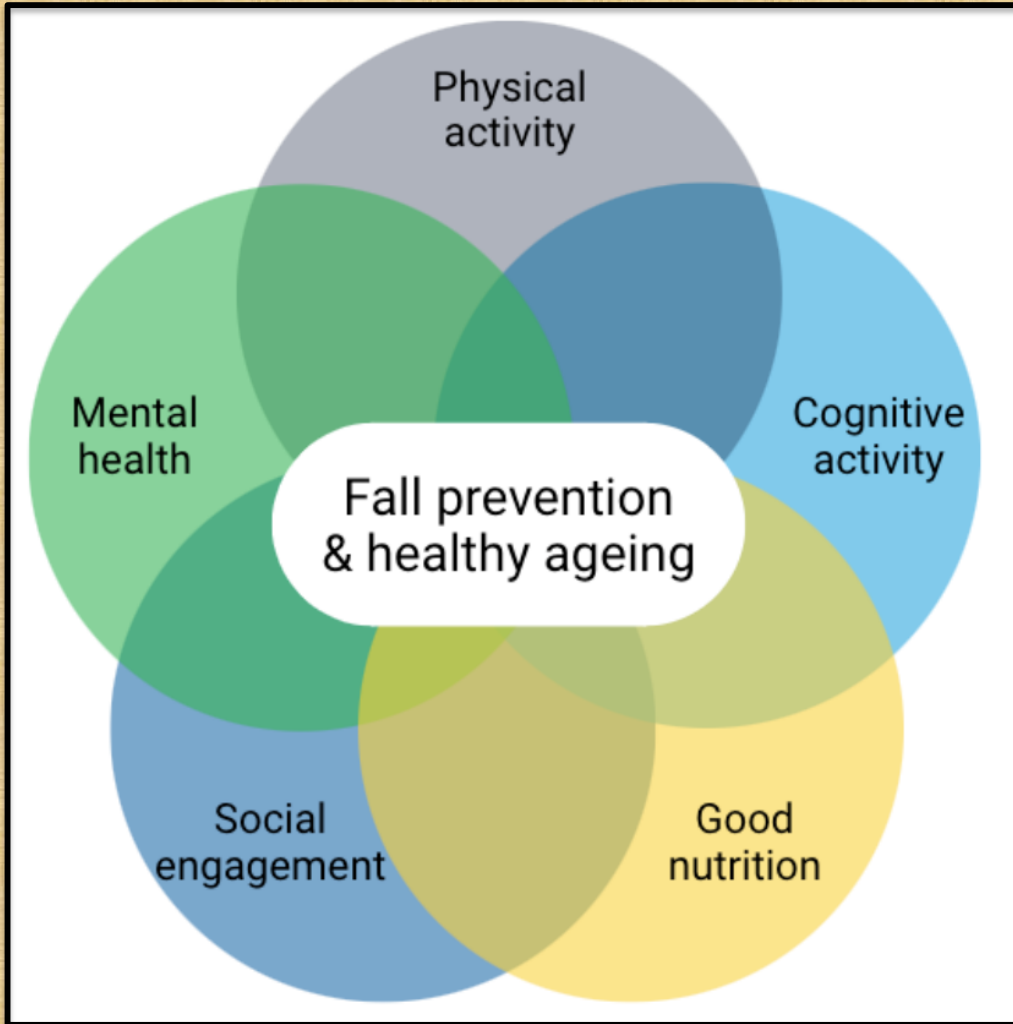
Brain Aging

Hippocampus



- Implicated in olfaction
- Memory (short-term; long-term)
- Neurogenesis even in adult life
- Spatial navigation
- Emotional behavior
- Regulation of hypothalamic function

Brain Aging



"Right now, there is no substitute for regular exercise to help with neurogenesis"
(Dr. Tanzi)



HARVARD
UNIVERSITY

Harvard Brain Science Initiative

GETTING YOUR SWEAT ON CAN...



Increase functional activity of the **temporal lobe**, which is responsible for **storing sensory memories**.



Improve **learning** and **mental performance**.



Help prevent and treat **Dementia, Alzheimer's** and **brain aging**.



Encourage the **pituitary gland** to release **endorphins**.



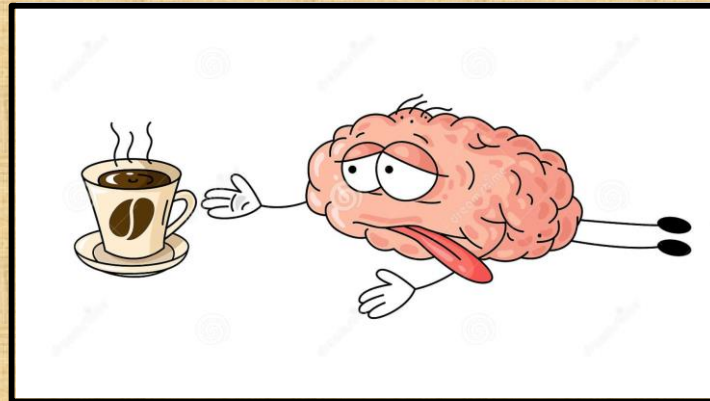
Reduce the impairment of brain cells and **loss of coordination** related to **Parkinson's disease**.



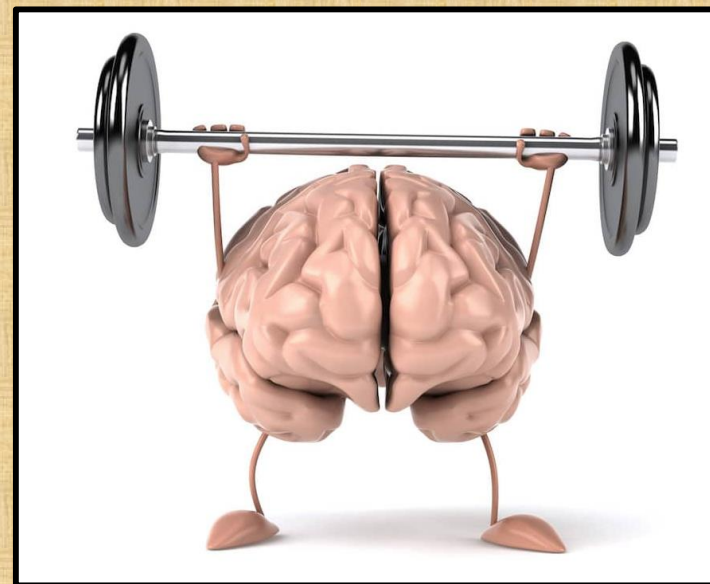
Reduce sensitivity to **stress, depression** and **anxiety**.



Increase levels of **brain-derived neurotrophic factor (BDNF)**, which **maintains and regenerates** adult nerve cells.



YOUR BRAIN ON EXERCISE



Neurodegenerative Conditions

Interventions to Possibly Reduce Risk...

Research suggests combining multiple healthy factors may be the most impactful



Physical Activity



Cognitive & Social Stimulation

Healthy Diet

ALZHEIMER'S ASSOCIATION®

MS and Exercise



MS
National Multiple Sclerosis Society

Exercise and physical activity can improve many motor and non-motor Parkinson's symptoms:



Aerobic Activity



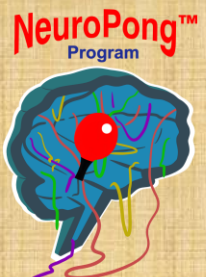
Strength Training

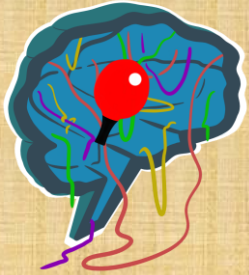


Balance, Agility & Multitasking

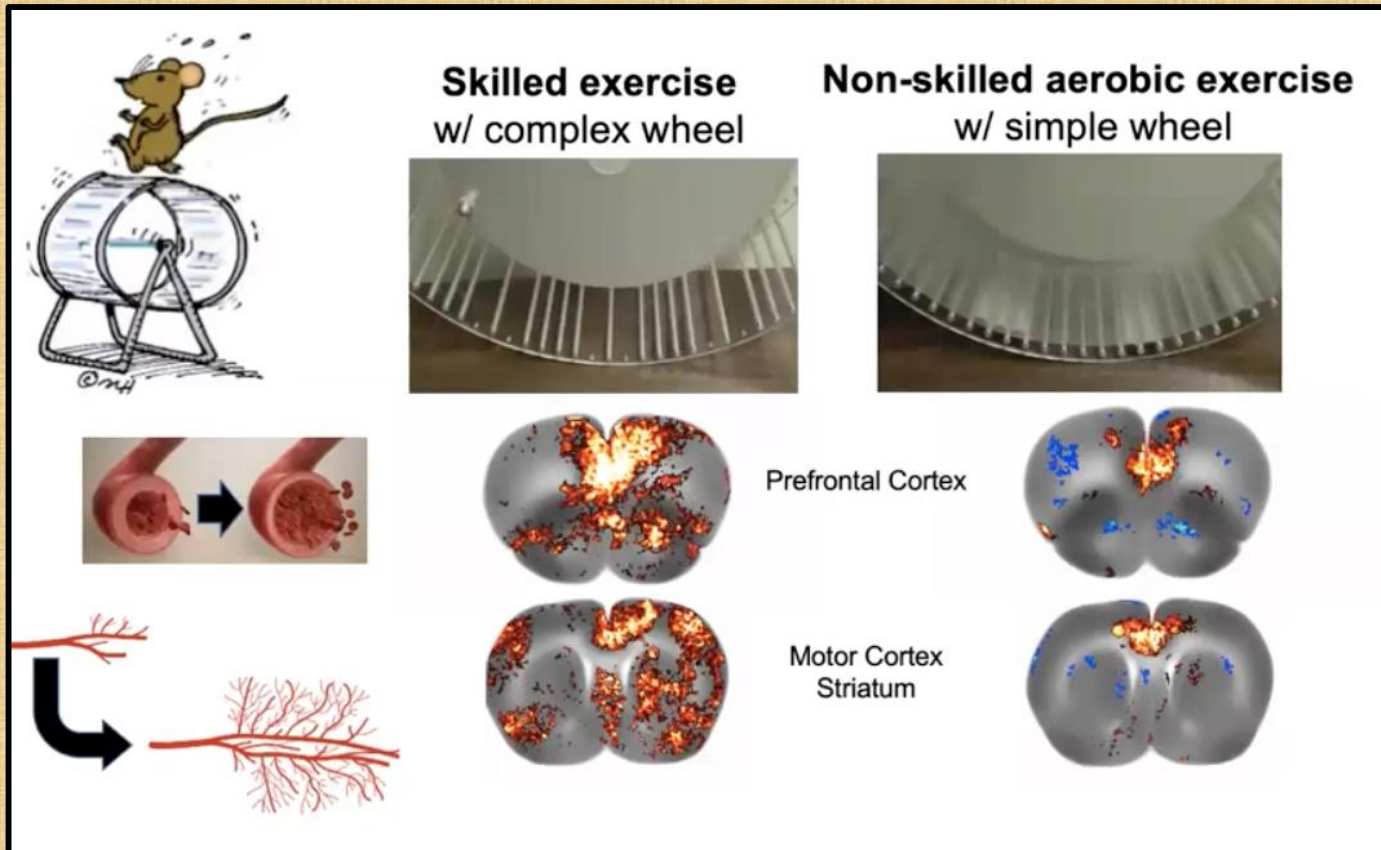


Stretching

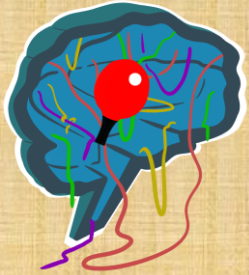




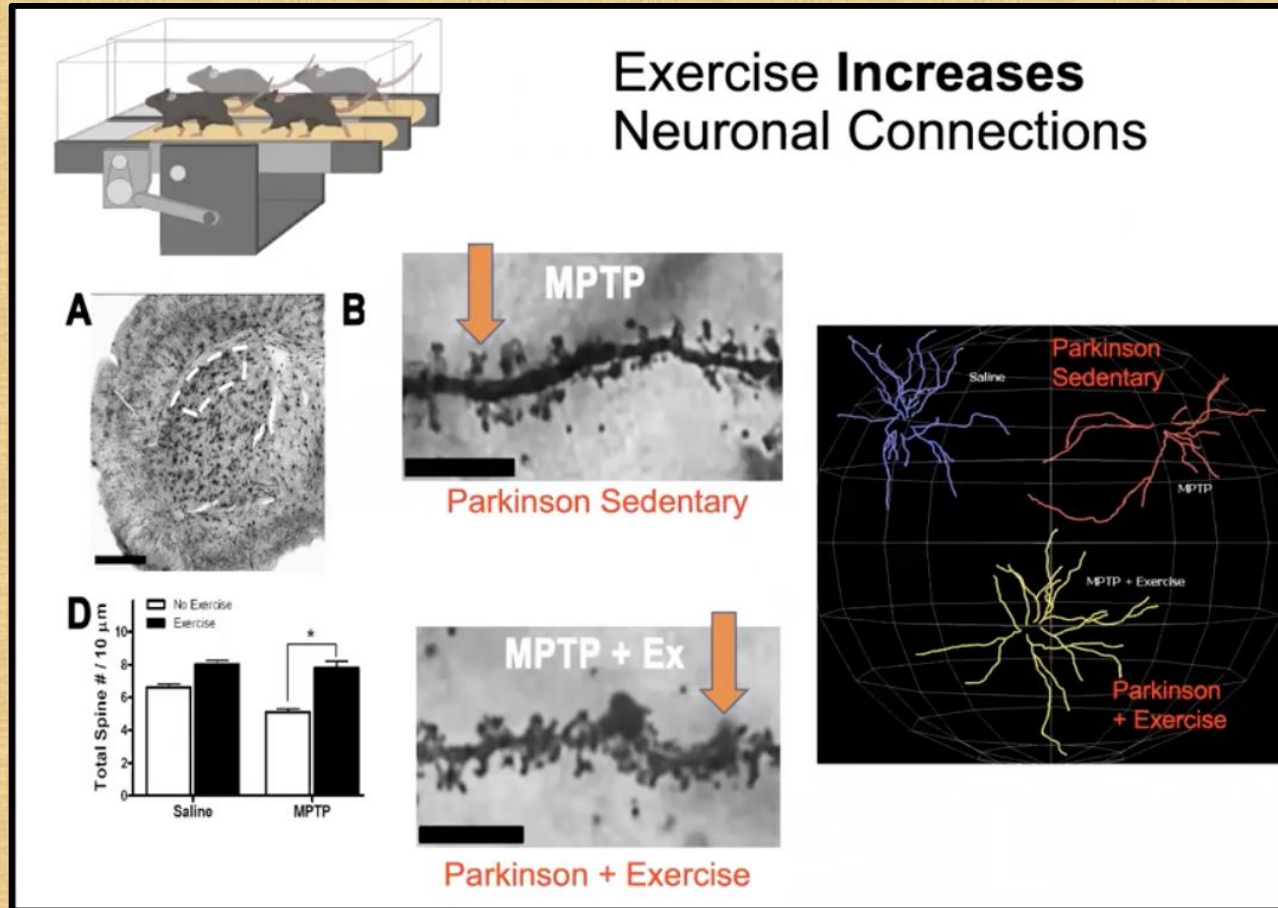
Exercise increases regional brain blood flow.



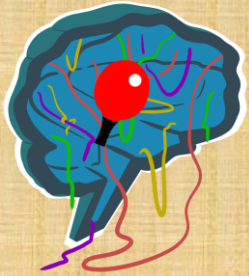
Vuckovic, Petzinger et al. Movement Disorders 2010



The neuroplastic effect of exercise in PD



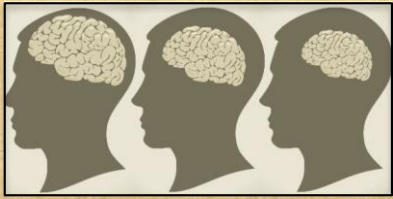
Vuckovic, Petzinger et al. Movement Disorders 2010



Neurogenesis and Neuroplasticity

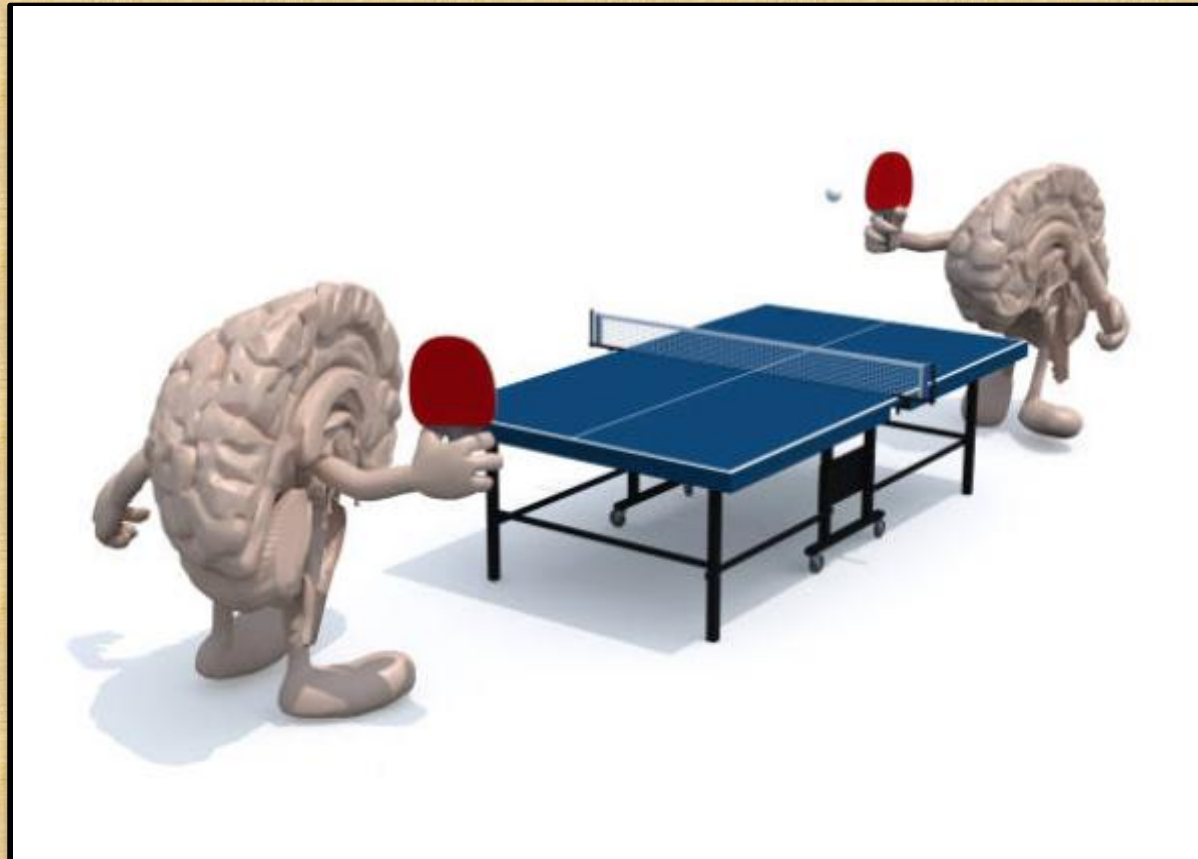


- * The brain's ability to reorganize itself by **forming new neural connections**:
 - new cells (neurogenesis)
 - new connections (synaptogenesis)
- * Synaptic restructuring:
 - **new** shape
 - **new** function
- * Mechanism(s) by which the **brain encodes experience** and **learns new behaviors**.
- * Mechanism(s) by which the damaged brain **relearns lost behavior** in response to rehab/exercise.

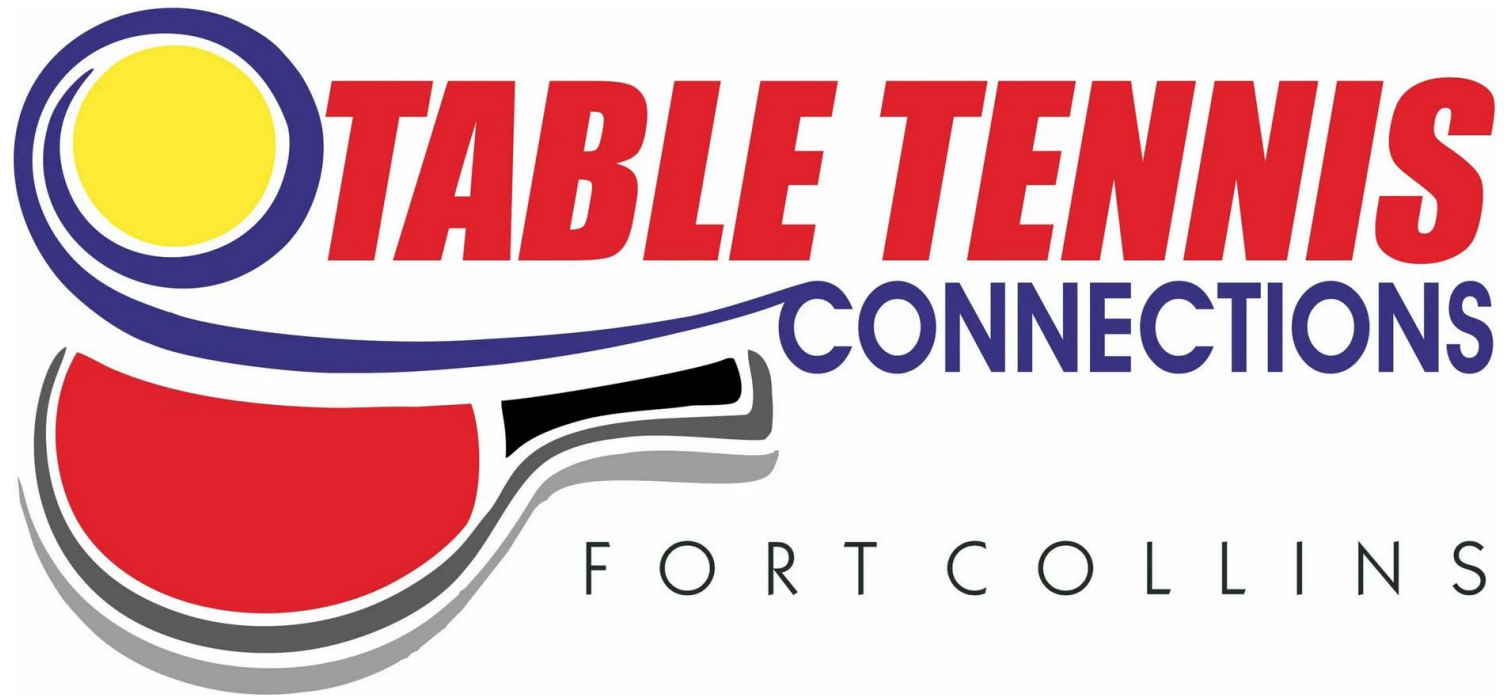


Brain Aging

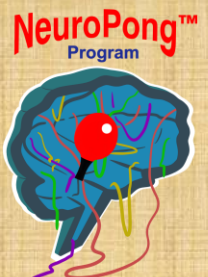
Ping Pong/Table Tennis:
#1 BRAIN SPORT !!!



Welcome to a place where everybody can
connect around a ... blue table !

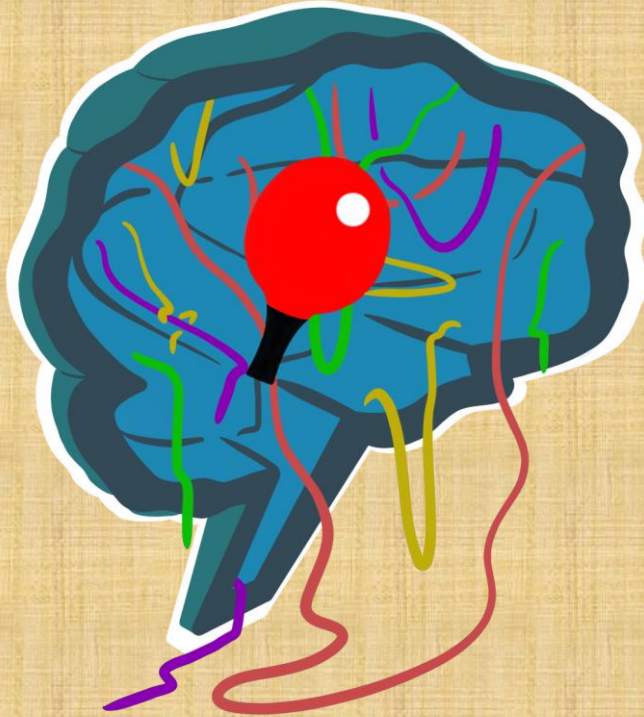


501(c)(3) Non-profit Organization



The NeuroPong™ Program

NeuroPong™
Program



- Table tennis program designed for and tailored to people with neurodegenerative conditions.
- It is a novel form of **neurological therapy** to be offered **at any stage** of their condition.
- Improve both motor and cognitive function.

Neurodegenerative Conditions



Multiple Sclerosis:

- 1 M people in the United States - 2.1 M people worldwide
- Every day 300 people in the world receive a diagnosis of MS
- Every 5 minutes someone in the world is diagnosed with MS every



Parkinson's Disease:

- The second most common neurodegenerative condition
- 1 M in the US today, 1.2 M by 2030 - 10 M people worldwide
- Each year 60,000 Americans are diagnosed with Parkinson's
- The incidence of PD in Colorado in 2018 was 11,500 people



Alzheimer's:

- The most common neurodegenerative condition
- 6.2 M in the US today - 55 M people worldwide
- 1 in 3 senior dies with Alzheimer's or other dementia
- Life time risk at age 45: W 1 in 5; M 1 in 10.

NeuroPong™: Multiple Sclerosis



NeuroPong™: Multiple Sclerosis



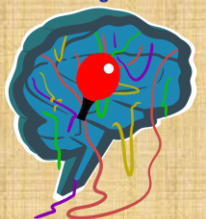
NeuroPong™: Multiple Sclerosis



NeuroPong™: Multiple Sclerosis



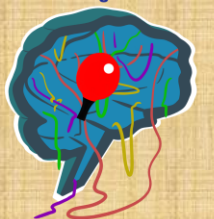
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NeuroPong™: Multiple Sclerosis



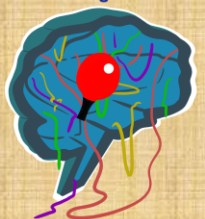
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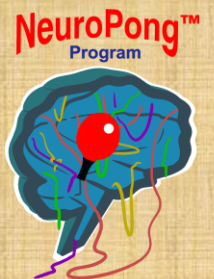
NeuroPong™: Multiple Sclerosis



NeuroPong™
Program



NeuroPong™: Parkinson's



NeuroPong™: Parkinson's



NeuroPong™: Parkinson's



NeuroPong™: Parkinson's



NeuroPong™: Parkinson's



NeuroPong™: Parkinson's



NeuroPong™: Parkinson's

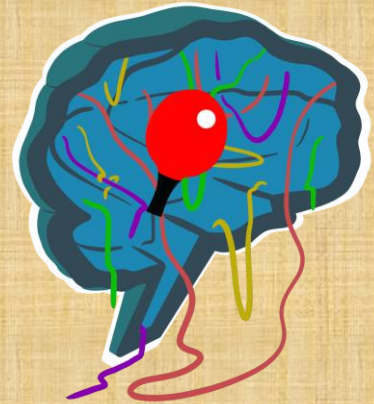


NeuroPong™: Parkinson's





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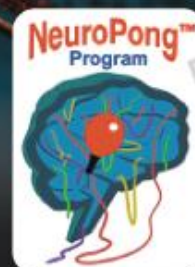


NEUROPONG

AT THE YMCA OF THE PIKES PEAK REGION

**Welcome to a place where everybody
can connect around a... blue table !**

Besides being played for fun or competition, table tennis can be of great support to people experiencing cognitive decline and neurodegenerative disorders like Alzheimer's disease, Parkinson's disease, Multiple Sclerosis and ADHD.



Program Goals:

1. Achieve improvement in motor function and disability status in people with Multiple Sclerosis.
2. Achieve improvement in both motor and non-motor symptoms in people with Parkinson's Disease.
3. Avoid further mental decline, without the use of medications, in people with Mild Cognitive Impairment.



**WHEN
TIME**

Tuesdays & Thursdays
1:00 - 3:00 p.m.

LOCATION

Downtown YMCA
207 North Nevada Avenue
Colorado Springs, CO 80903
In the Small Gym

Ultimately, we want to provide physical, mental,
and emotional improvement in everyone's life,
no matter what their capabilities may be.



YMCA of the Pikes Peak Region
ppymca.org

For more information contact Travis Lerma
at 719.495.5130 or tlerma@ppymca.org

NeuroPong™
Program

