Is Body Fitness Really Brain Fitness? How Exercise Boosts Brain Power

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At our 2011 Healthy Aging Alliance Conference: Hugh Ferguson completes 80-mile bike ride on 80th birthday in 8 hours

Hugh was frail, couldn’t play the violin, on many pills, had worsening memory
Stopped pills, started biking!
Countless other similar stories since then made me ask the question...

• So what does exercise really do for our brains?
• And then I saw this video...
• http://www.youtube.com/watch?v=aaY3gz5tJSk (ADD VIDEO)
Health Benefits of Exercise

• Decreases mortality
• Decreases heart disease
• Decreases risk of diabetes and improves diabetic control
• Decreases hypertension
• Decreases osteoporosis

Is exercise also good for the brain?
Exercise is good...at any age

• Our brains were built for movement equivalent of walking 12 miles a day.
• To improve your thinking skills, move.
• Exercise gets blood to your brain, bringing it glucose for energy and oxygen to soak up the toxic electrons that are left over. It also stimulates proteins that keeps neurons connecting.
• **Aerobic exercise just twice a week cuts your risk of Alzheimer's by 60 percent.**
Is there an age or stage of frailty when exercise is no longer useful?

Buchner, et al. 1992
The Bad News

• Most of us don’t meet recommended activity targets (30 minutes 5 or more days per week)
• The peak of the Age Wave is 64; this is a huge group of people...all of whom need to keep active to maintain body function and brain health
• Brain disorders are the #1 source of disability in the country (Francis Collins, Director of NIH)
• Because there will be SO many people getting old, these individuals will be all around us...driving...taking care of our children...even as they lose their bodily movement and cognitive ability.
The Good News

- We can take action as a society and as individuals to do everything we can to prevent or ameliorate this loss of movement and brain power.
- We DO know that the single most effective thing for fitness (for anyone and everyone) is exercise.
What is the evidence for exercise and brain health?

- Cycling and health
- Tai chi for falls prevention, pain, heart health
- Tai chi for brain health
  - Executive function: the key to maintaining independence
- Strength training for brain health
  - Also shown to improve executive function
Cycling is good for your health

• Active Assisted Cycling with 10 Parkinson’s patients reduced tremor and bradykinesia
  • Ridget, et al, 2012

• A Systematic Review of 16 studies showed strong inverse relationship between commuter cycling and all-cause mortality, cancer mortality, and moderate benefit for cardiovascular morbidity among middle-aged to elderly subjects
  • Oja, et al, 2010

• A study of the commuter biking program in Barcelona showed it saved 12 lives per year- not to mention reduced carbon emissions
  • Rojas-Rueda, et al, 2011
Tai Chi is good for your health

• Tai chi reduces falls and injurious falls in older adults by 50%
• Improves sleep
• Decreases pain from arthritis and fibromyalgia
• Improves blood pressure
• Improves cholesterol
• Improves walking distance in patients with heart problems
• People love it- and there are no adverse outcomes
Tai Chi is good for brain health

- Tai chi improves brain function in people with dementia, and may protect against development of cognitive problems
  - Improves executive function, or planning ability
- Tai chi improves brain function even compared to walking or other exercise groups
- Risks of tai chi extremely low, even in somewhat fragile populations
- There is probably a community center or gym near you or your constituents that offers tai chi!
  - Wayne, JAGS, 2014
Tai Chi is good for people with Parkinson’s Disease

• In people with mild-moderate Parkinson’s disease, Tai chi improves maximum excursion and directional control AND functional reach, Timed up and go, stride length, walking velocity compared to resistance training or stretching

• Falls were reduced by 67% compared to stretching group

• There were no adverse events reported in this trial- tai chi is safe for Parkinson’s patients
  • Li, F, Eckstrom, E, et al, NEJM 2012; 366:511-19
Strength training is good for brain health

Women 65-75 did strength training 2 times per week for a year.
At the end of the year, they had improved executive function compared to the control group.

– Liu-Ambrose T, 2010
Why does executive function matter?

- Executive function is the “planning” part of our brain—which is vital to cooking for ourselves, managing our medications, driving, etc
- Loss of executive function means loss of the ability to live independently
Elizabeth’s Exercise Prescription

- Aerobic Exercise for 30 minutes daily (such as biking)
- Balance exercise like tai chi for one hour 3 days per week
- Strength training twice per week
Good heart health also means good brain health!

Research shows that every type of dementia has a vascular component: How your blood flows affects your brain. There is no cure for dementia on the horizon, but maintaining a healthy lifestyle can help. Following the American Heart Association’s “Life’s Simple 7” steps can help you live a heart- and brain-healthy life.

1. *Stop smoking.* Smoking is the leading contributor to premature death in the U.S. It contributes to plaque buildup in the arteries, which causes clotting and serious health problems.

2. *Get active.* 30 minutes of moderate exercise, five times a week, helps you lose or maintain weight and lower blood pressure, increases HDL (“good” cholesterol) and helps keep blood sugar levels in check. It relieves stress and has a positive effect on mood.

3. *Eat better.* Fill half of your plate with fruits and vegetables for meals and snacks, swap out butter and lard for healthy fats such as olive oil, and amp up your fish intake... the famous Mediterranean diet!

4. *Maintain a healthy weight.* Too much fat — especially around the waist — increases the risks of high blood pressure, high cholesterol and diabetes.

5. *Reduce blood sugar.* Your fasting blood glucose should be below 100 milligrams per deciliter.

6. *Manage blood pressure.* Blood pressure should be below 120/80 millimeters.

7. *Control cholesterol.* Total cholesterol should be below 200 milligrams per deciliter.

Contact and work with your doctor to find out exactly where you are on each of these seven steps. Then choose a goal — maybe just one or two items. Each month, the OHSU Brain Institute Facebook page will provide helpful information about each one of the seven steps.

www.ohsubrain.com/healthyseven