



Physical Exercise for Your Brain

Physical exercise protects and enhances your brain. It is perhaps the single most important thing you can do to keep your neurons healthy over time. Moderate exercise improves the heart's ability to pump blood throughout the body and helps maintain healthy blood flow to the brain, which increases oxygen and glucose delivery. Exercise also reduces damage to neurons from toxic substances from the environment and it enhances insulin's ability to prevent high blood sugar levels, thereby reducing the risk of diabetes. Physical exercise also helps protect the short-term memory structures in your temporal lobes (hippocampus) from high stress conditions. Stress causes the adrenal glands to produce excessive amounts of the hormone cortisol, which has been found to kill cells in the hippocampus and hurt memory. In fact, people with Alzheimer's Disease have higher cortisol levels than normal aging people.

Exercise actually stimulates "neurogenesis," the ability of the brain to generate new neurons. Exercise exerts a protective effect on hippocampal neurons that lasts about three days. Therefore, the minimum frequency of exercise is every three days, or three times a week.

Studies have shown that the more frequently you exercise, the greater the benefits. Lack of exercise negatively affects blood supply in the body. People who do not exercise after 40 years old are not as mentally sharp as people who regularly exercise. A regular habit of physical exercise is a major preventive strategy for age-related memory problems. This is a cumulative effect so the sooner you start and the more years you have been exercising the better. If you wait until you are 70 and experiencing memory loss, this benefit will be lost to you. This means that it is important to establish a regular habit of exercise in your life now, and not wait until your 70s to start.

Exercise also enhances the production of glutathione, which is the major antioxidant in all cells, to protect your muscles and other tissues against free radical damage. Conversely, chronic inactivity ("couch potato" syndrome) reduces cell glutathione levels so that free radicals can damage your cells and trigger programmed cell death.

Research has shown that the benefits of mild to moderate exercise include:

- Protecting brain cells against toxins, including free radicals.
- Repairing your cellular DNA to help protect against programmed cell death.
- Reducing the risks of cognitive impairment and dementia due to Alzheimer's Disease in persons over 65 years old by about fifty percent.
- Preserving your mental abilities after age 70 years old.
- Reducing risk of depression.
- Reducing risks of falling by improving muscle tone and endurance, and reducing strokes to the deep brain areas.

In a large study from Quebec, Canada, Dr. D. Laurin and colleagues explored the association between physical activity and the risk of cognitive impairment and dementia. They concluded that regular physical activity could represent an important and potent protective factor against cognitive decline and dementia in elderly people. The best kinds of exercise improve the pump force of your heart (cardiovascular exercise) and strengthen the muscles of your body (resistive exercise). Cardiovascular exercise involves gradually warming up your muscles, then exercising them for 30 minutes or more to develop muscle tone for endurance (e.g., walking, running, swimming, rowing, cycling, stair climbing, cross-country skiing, etc.). Resistive exercise builds muscle strength by exercising them against resistance (e.g., sit-ups, pushups, lifting weights, rowing, stair climbing, swimming, cycling, cross-country skiing, and so on). As you can see, several types of exercise fall into both categories, including rowing, stair climbing, swimming, cycling, and cross-country skiing. You can also make walking and running resistive exercises if you add

weights.

My favorite exercise is table tennis (aka ping pong). It is highly aerobic, uses both the upper and lower body, is great for eye hand coordination and reflexes, and causes you to use many different areas of the brain at once as you are tracking the ball, planning shots and strategies, and figuring out spins. It is like aerobic chess. Plus, table tennis causes very few head injuries. Exercise has profound and broad-based effects on your health. A study done at Case-Western University looked at how much TV people watch each day, which correlates with their exercise level. People who watched two or more hours of TV a day (couch potatoes) were twice as likely to develop AD. In contrast, people over 40 years old who exercise at least 30 minutes per session two or more times a week reaped many benefits. My recommendation is that it is essential to make consistent exercise a habit, one that will keep you and your brain healthy and save you more money than any other single thing you ever do for your health. It's well worth the effort.

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