



Exercise for Health – How Much is Enough?

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In the exercise culture of today there are two extremes. On one side are the individuals who won't, don't, or can't do any physical activity beyond the simple tasks of daily living (lazy). We know that is a problem, because we have been barraged by headlines that say a lack of exercise is linked to everything from obesity and heart disease to diabetes and memory problems. Only 3 out of 10 adults are active enough to stay healthy and fit. **Simply put, if you don't move around, you aren't going to be around.**

On the other side are those who engage in physical activities that many people would think are way too advanced for most individuals (extreme). This extreme side sends a message to the lazy side that exercise has to be extreme to be optimal for your health. Wrong! (See results of a recent 12-week study discussed below).

Physical exercise influences how genes function. Much of the DNA that is not located in our genes consists of *switches* that govern whether our genes are turned "on" (producing proteins) or not. This relatively new discovery is a breakthrough because the future of personalized medicine is not just identifying the genes you inherited, but also to be able to turn-on the ones that you want 'on' and turning-off the ones that you want 'off'. We now know you can turn-on some key healthful genes and turn-off some disease-promoting genes with regular physical activity.

However, extreme exercise or even exercising more than your optimal amount (see below) will not get you healthier; it may make you more fit, but not healthier and may be harmful. Many studies have clearly demonstrated that for optimal health - weight control, longevity, preventing cancer and arterial diseases, sex drive, and maintaining brain health - you do not need extremes. But you do need consistent regular physical exercise.

A recent study published in JAMA Internal Medicine, scientists with the division of cancer epidemiology and genetics at the National Cancer Institute, as well as Harvard Medical School tracked 1.44 million participants for a decade or more, noting disease diagnoses and, in some instances, deaths. The researchers focused on specific information for each of those 1.44 million people about whether they exercised, and how vigorously and how often. They also zeroed in on whether and when, after each study's start, the participant had been diagnosed with any type of cancer. Then, using elaborate statistical methods, they computed the role that exercise, and in particular, moderate or vigorous exercise such as brisk walking or jogging, seemed to be playing in people's risks for cancer. It turned out to be considerable. For most cancers, people who reported exercising moderately, even if the time that they spent exercising was slight, had significantly less risk of developing 13 different types of cancer than people who were sedentary. The researchers found a reduced risk of breast, lung and colon cancers, which had been reported in earlier research. But they also found a lower risk of tumors in the liver, esophagus, kidney, stomach, endometrium, blood, bone marrow, head and neck, rectum and bladder. The reductions in risk for any of these 13 cancers rose steeply as people exercised more optimally.

What's Optimal? 10,000 Steps a Day

Ten thousand steps a day provides about 9 years of longevity for women and 8.1 years for men. When you think of exercise, think about moving more and regularly. Walking is one of nature's greatest preventive medicines. 10,000 steps a day makes you age slower and develop fewer disabilities, all while giving you more energy. Interestingly, 10,000 steps a day seems to be optimal as it reduces insulin resistance (pre-diabetes) much better than 8,000 steps, but 12,000 steps does not help more than 10,000. You may get more fit, but neither your health nor longevity are improved. More is not necessarily better. In addition, walking (and exercise in general) increases the size of your brain's memory center (your

hippocampus) by up to 2 percent a year. But staying on the couch will actually shrink your memory region 0.5 percent per year, adding to memory loss.

Exercise increases the growth of new brain cells and encourages better memory formation. A Harvard research investigation studied more than 13,000 women who reached or passed age 70 and were in “super-healthy” condition with no cancer, diabetes, heart attacks, cognitive impairment, or physical or mental health limitations. What these women had in common was physical activity. Those who were the most physically active in their 60’s (nearly 10,000 steps a day) were about twice as likely to be super-healthy after age 70 as those who were the least active.

Build Strength Through Weight-Bearing Exercises

Ignoring resistance training is ignoring your health. Experts acknowledge that one of the secrets to a healthier body is doing some sort of training in which you move weight (even your own body) against gravity. A short routine twice a week will get maximum health benefits. When you perform resistance training, you break down muscle fibers. In the days that follow, the fibers rebuild the muscle stronger in anticipation of the next time you try to break them down. So over time, you are adding muscle to your body, and that makes you better able to protect your joints. More muscle means fewer injuries, so you are more likely to stick to your routine and stay healthy.

A simple goal-setting weight-bearing program is:

- 2 to 3 times a week
- 15 to 20 minutes each session
- Start with 3-5 lb. weights
- Start with 12 repetitions and increase the weight when 12 reps are easy
- Exercise your both the upper and lower large muscles
- Focus on your core (abdomen, hips & buttocks)

Breaking a Sweat Has Many Advantages

A major way to improve your heart performance is to work up a sweat, ideally 3 times a week.

Why? Getting your heart rate up to the ‘sweat level’ improves your:

- Circulation
- Blood Pressure
- Energy
- Weight
- Flexibility
- Balance
- Skin Color
- Personal Time

So, How Much Regular Exercise is Enough?

In a recent (2016) 12-week study, published in PLOS One, one minute of arduous exercise was comparable in its physiological effects to 45 minutes of gentler sweating.

In this controlled study *sprint interval training (SIT)* was characterized by brief intermittent bursts of relatively intense exercise separated by periods of low-intensity exercise for recovery. A group of participants warmed up for two minutes on stationary bicycles, then pedaled as hard as possible for 20 seconds; rode at a very slow pace for two minutes, sprinted all-out again for 20 seconds; recovered with slow riding for another two minutes; pedaled all-out for a final 20 seconds; then cooled down for three minutes. The entire workout lasted 10 minutes, with only one minute of that time being strenuous.

A second participant group engaged in a moderate-intensity continuous training (**MICT**) and consisted of a typical endurance-workout routine, e.g., riding at a moderate pace on a stationary bicycle at the lab for 45 minutes, with a two-minute warm-up and three-minute cool down. MICT programs have reported improvements in cardiorespiratory fitness, skeletal muscle oxidative capacity and insulin sensitivity based on oral glucose tolerance tests. A third control group was asked to change nothing about their current,

virtually nonexistent exercise routines. Both groups of exercising volunteers completed three sessions each week for 12 weeks, a period of time that is about twice as long as in most past studies of interval training.

Results: By the end of the study the MICT endurance group had ridden for 27 hours, while the SIT interval group had ridden for six hours, with only 36 minutes of that time being strenuous. But when the scientists retested the men's aerobic fitness, muscles and blood-sugar control, they found that BOTH groups of exercisers showed virtually identical gains, whether they had completed the long endurance workouts or the short, grueling intervals. In both groups, endurance had increased by nearly 20 percent, insulin resistance likewise had improved significantly, and there were significant increases in the number and function of certain microscopic structures in the men's muscles that are related to energy production and oxygen consumption. There were no changes in health or fitness evident in the control group. The upshot of these results is that three months of concerted endurance or interval exercise can notably — and almost identically — improve someone's fitness and health. Neither approach to exercise was, however, superior to the other, except that one was shorter — much, much shorter.

I also strongly recommend the regular practice of Tai Chi. **Tai Chi** is a martial art form that has become popular in the U.S., especially among older adults. The technique involves slow, focused movements, requires learning and memorizing new skills and movement patterns. A recent study published in the *Journal of the American Geriatrics Society* demonstrated regular Tai Chi exercise enhanced cognitive function, especially in the realm of executive function, such as planning, working memory, attention, problem solving, and verbal reasoning. (You can learn how I personally adopted Tai Chi in my website article: *Thoughts on Balance – My Personal Story*, published in the Longevity Articles.)

Low-impact activities such as swimming, cycling, or exercise equipment will get your heart rate up without compromising your joints. Above all, do not give up when you fail to follow your exact plan. Being consistent, creative, buddying up, and committed are the most powerful tools you possess to take on your days' unexpected (and expected) challenges with flexibility and less stress.

In summary, find or create a program that you are willing to commit to and as long as you are physically able. Schedule ahead the days and times for each week and show up! Remember, with any new behavior or activity it takes 8 weeks to establish the new neural pathways (re-patterning) in the brain for this behavior to become the *new* normal. Bottom Line: Exercise improves brain health.

Remember, your regular exercise program will be reflected in your lifetime health!

It is not about living longer. It is about living well.

[This article includes excerpts from Michael F. Roizen, M.D. (Chief Wellness Officer and Chair at the Wellness Institute of the Cleveland Clinic); Robb Report - Health & Wellness News (newsletter@email.robbreport.com).]

Mind-body interventions such as meditation, yoga*, and tai chi can reverse the molecular reactions in our DNA that cause ill-health and depression, according to a study by scientists at the universities of Coventry and Radboud.

When a person is exposed to a stressful event, their sympathetic nervous system (responsible for the "fight-or-flight" response) is triggered, which increases production of a molecule called **nuclear factor kappa B (NF-kB)**. That molecule then activates genes to produce proteins called **cytokines** that cause inflammation at the cellular level, affecting the body, brain, and immune system.

That's useful as a short-lived fight-or-flight reaction. However, if persistent, it leads to a higher risk of cancer, accelerated aging, and psychiatric disorders like depression and dementia.

But in a [paper](#) published June 16, 2017 in the open-access journal *Frontiers in Immunology*, the researchers reveal summary findings of 18 studies (featuring 846 participants over 11 years) indicating that people who practice mind-body interventions exhibit the opposite effect. They showed a **decrease** in production of **NF-kB and cytokines** — reducing the **pro-inflammatory gene expression pattern** and the risk of inflammation-related diseases and conditions

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