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Ten Important Truths About Aging

The more mentally stimulating lives we lead, the less exposed we are to problems as we age

By Elkhonon Goldberg and Alvaro Fernandez

As the legal profession debates various ethical issues pertaining to the “graying of the bar,” it’s important to consider the neuropsychological perspective. According to up-to-the-minute research, aging by itself does not mean decline. As we grow older, we improve in some areas, we get worse in others and, up to a point, we can control the course we take, as the following ten truths will explain.

Aging Means Lifelong Development, Not Automatic Decline

We prefer to talk more about change than about decline. As Sharon Begley wrote in “The Upside of Aging” (*The Wall Street Journal*, February 17, 2007),

But it's not all doom and gloom. An emerging body of research shows that a surprising array of mental functions hold up well into old age, while others actually get better. Vocabulary improves, as do other verbal abilities such as facility with synonyms and antonyms. Older brains are packed with more so-called expert knowledge—information relevant to your occupation or hobby. (Older bridge enthusiasts have at their mental beck-and-call many more bids and responses.) They also store more "cognitive templates," or mental outlines of generic problems and solutions that can be tapped when confronting new problems.

In his most recent book, *The Wisdom Paradox: How Your Mind Can Grow Stronger As Your Brain Grows Older*, Dr. Goldberg explains that as we undergo experiences, we actually change our brains by creating new neurons and synapses. This process never stops; our brains enjoy lifelong plasticity. Until recently, a popular misconception was that neurons die as we age and do not get replenished. Now, neurogenesis, or the ability of our brains to create new neurons until the very day we die, is a proven reality.

Some Skills Improve With Age

In our "Exercising Our Brains" classes, we typically explain how some brain functions improve as we age; that is, we get better at self-regulation and emotional functioning, and we accumulate wisdom. Today, scientists are beginning to talk about wisdom as a biological category. We can define wisdom, at least in part, as the pattern recognition that enables us to solve problems efficiently, develop empathy and insight into others' minds, refine moral reasoning, and most importantly, be able to prescribe (not merely describe) how to adapt to our environment.

For example, as lawyers tackle more completed cases, they develop an "intuition" for solutions and strategies. As long as the environment does not change too rapidly, we can continue to accumulate wisdom.

Some Skills Need To Be Continuously Nurtured And Trained

Some areas of mental functioning typically decline. We usually see this in areas that test our capacity to learn and adapt to new environments, such as effortful problem-solving in novel situations, processing speed, working memory, attention and mental imagery. (These are some of the areas that the computer-based programs mentioned below focus on.)

Not All Instances Of Forgetting Are Of Equal Concern

There is an essential difference between not remembering where you put your car keys today...which happens to all of us when we are too absorbed in something else...and not remembering why you need keys to open the car. Sometimes we tend to worry too much over memory lapses that aren't significant. Memory may decline over the years, but many people can continue to function well before serious problems develop. We should take action as soon as we can, but we don't have to become unduly concerned.

We Are In Control, To A Large Extent

Studies have shown a tremendous variability in how well people age and how, to a large extent, our actions influence our rate of improvement and/or decline. Our awareness that it's not all doom and gloom and that there's much we can do is important. As Atul Gawande wrote in "The Way We Age Now: Can medicine serve an aging population?" (*The New Yorker*, April 30th, 2007):

"For most of our hundred-thousand-year existence—all but the past couple of hundred years—the average life span of human beings has been thirty years or less. (Research suggests that subjects of the Roman Empire had an average life expectancy of twenty-eight years.)"

"Inheritance has surprisingly little influence on longevity. James Vaupel, of the Max Planck Institute for Demographic Research, in Rostock, Germany, notes that only six per cent of how long you'll live, compared with the average, is explained by your parents' longevity; by contrast, up to ninety per cent of how tall you are, compared with the average, is explained by your parents' height. Even genetically identical twins vary widely in life span: the typical gap is more than fifteen years."

In terms of healthy aging, nurture seems to be at least as important as nature, which means that how we age is at least partially under our control.

There Are Four "Pillars Of Brain Health"

According to the existing scientific literature, if we want to maximize our chances of healthy brain aging, we should focus on four pillars: physical exercise, a balanced diet, brain exercise and stress management. And the earlier we begin the better, if we want to build a Cognitive Reserve (more on this later).

1. Physical Exercise

Physical exercise has been shown to enhance brain physiology in animals and, more recently, in humans. Exercise improves learning through increased blood supply and growth hormones.

If you can only do one thing, focus on cardiovascular training—exercise that

gets your heart beating faster, like walking, running, skiing, swimming, biking, hiking, tennis, basketball, playing tag, and ultimate Frisbee.

2. Balanced Nutrition

As a general guideline, what is good for your body is also good for your brain. Eat a variety of foods of different colors while avoiding foods with added ingredients or processed foods.

Add some cold-water fish to your diet (tuna, salmon, mackerel, halibut, sardines, and herring) which contain omega-3 fatty acids.

If you can only focus on one change, eat more vegetables, particularly leafy green ones.

Few supplements have shown long-term benefits on memory and other cognitive functions.

3. Stress Management

Since chronic stress reduces and can even inhibit the creation of new neurons, stress management is important.

Practice meditation, yoga, or other calming activities as a way to take a relaxing time-out. If you want a more high-tech option, use biofeedback devices that measure heart rate variability and allow you to see your levels of stress in real-time.

If you can only do one thing, set aside 5-10 minutes to just breathe deeply and recharge.

4. Brain Exercise

Mental exercise can accelerate the rate that new neurons are created and enhance the chances of their survival, and strengthen the synapses or connections among neurons, thus improving overall cognitive functioning.

The 3 key principles for good brain exercise are:

1. Novelty: you need to try new things, including things you aren't good at.
2. Variety: given that the brain is composed of a variety of functionally distinct areas, you need to ensure a complete mental "workout circuit" to maintain sharpness in all areas. Excessive specialization is not the best strategy for our long-term Brain Health.
3. Challenge: you need to be exposed to increasing levels of challenge, so the task is never too easy.

If you can only do one thing, learn something new every day.

Cross-Training Our Brains Builds Up Cognitive Reserve

It's important to explain brain exercise in more detail. When we cross-train our brains, by doing activities that provide us with novelty, variety and challenge, we are building up our "Cognitive Reserve" or buffer against decline.

The concept of Cognitive Reserve has been around since 1998 when a post- mortem analysis of 137 people with Alzheimer's disease showed that the patients exhibited fewer clinical symptoms than their actual pathology suggested. Their brains also weighed more and had a greater number of neurons when compared to age-matched control groups. The investigators hypothesized that the patients had a larger "reserve" of neurons and abilities that offset the losses caused by Alzheimer's. Since then, the concept of cognitive reserve has been defined as the ability of an individual to tolerate progressive brain pathology (including Alzheimer's plaques and tangles) without demonstrating clinical cognitive symptoms.

In one study of 1772 non-demented individuals over seven years that controlled for factors like ethnic group, education, and occupation, participants with high leisure activity had 38% less risk of developing dementia, and that risk was reduced by approximately 12% for each additional leisure activity adopted. Subsequent research, including imaging studies of cerebral blood flow, continues to build up data showing that frequent participation in cognitively stimulating activities reduces the risk of Alzheimer's disease and slows the rate of cognitive decline. Interestingly, physical, social, and intellectual activities all help, although intellectual activities are associated with the lowest risk of developing dementia.

Participation in stimulating activities spurs neuronal growth and results in a larger number of neurons and neuronal connections to compensate for brain pathology. The net result is this: the more mentally stimulating lives we lead, the less exposed we are to problems as we age.

Computer-Based Brain Exercise Programs Can Help

You can expect more "brain training" computer-based programs to appear in the market over the next five to ten years since they are great tools that help us complement and enhance other activities in our daily lives. Computer-based brain training programs can deliver the right mix of novelty and variety at constantly evolving difficulty levels that ensure constant challenge. SharpBrains constantly reviews programs developed by scientists worldwide. Visit our [website](#) if you want to learn more about a variety of programs and how to select the ones that can be useful to you.

These programs, until recently mostly used by neuropsychologists in clinical settings,

have been adapted and improved to provide healthy individuals with the intense mental challenges that help build the Cognitive Reserve and improve specific brain functions. We have seen both research and testimonials indicating that intensive and well-targeted Brain Fitness Programs can produce good results in as little as 3 months.

Embrace “Good” Stress; Eliminate “Bad” Stress

Stress can be positive. For example, it probably helped you deliver the court room performance of your life. Short term stress can help you focus and perform—if it’s in the right amount and short-lived. In other words, you feel the jitters or adrenaline for a period of time, and then you use it up accomplishing your goal. Afterwards, you need to rest and recover while basking in the glow of your accomplishment.

General Adaptation Syndrome (GAS) describes long-term, chronic stress that just does not go away. GAS may paralyze you into inaction, during which you just stare at the problem and worry without being able to do anything about it. This type of stress is harmful to the brain; disrupts your immune and cardiovascular systems; and makes you anxious, irritable, and unable to sleep. If you’re afflicted with GAS, try meditation, yoga, tai chi, or biofeedback programs.

Retirement Is Overrated

Many baby boomers want to remain active and mentally stimulated beyond arbitrary retirement ages. Given demographic trends, this will create a large group of people working into their 60s, 70s, and 80s. Society at large will have to adapt its education, health and employment policies to benefit from this trend.

In summary, the latest neuroscientific research has shown that, contrary to popular belief, the brain is constantly undergoing neurogenesis. Learning new things and targeted mental exercise promote the development of new neurons and connections between neurons, just as muscle growth is promoted through physical exercise—and this can take place at all ages. Indeed, work itself, and embarking on second and third careers, can provide great cognitive exercise.

RESOURCES

1. Goldberg, Elkhonon, Ph.D., [The Executive Brain: Frontal Lobes and the Civilized Mind](#), Oxford University Press, 2001; paperback 2002.
2. Goldberg, Elkhonon, Ph.D., [The Wisdom Paradox: How Your Mind Can Grow Stronger As Your Brain Grows Older](#), Gotham Books, Penguin, 2005; paperback 2006.
3. SharpBrains' [Brain Fitness Topics](#) and [Blog](#).

