

# LIVING TO 100:

## What's the secret?



FROM  
HARVARD MEDICAL SCHOOL

*Trusted advice for healthier life*

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**S**tarting in the year 2012, 10,000 people a day will start turning 65. We are aging differently than previous generations, however. Physically and mentally, the health of today's 70-year-old now equals that of a 65-year-old in the 1970s. In that period, deaths from heart disease and many cancers have dipped. And while most older adults have at least one chronic health problem, disability has slowly but significantly declined.

Our life expectancy continues to inch upward, a happy trend, although some wonder if we could be doing better, since the United States has been slipping downward in longevity rankings compared with many other countries. Infectious disease and acute illnesses, once the leading causes of death, have given way to chronic ailments and degenerative illnesses — like heart disease and Alzheimer's disease — that people often live with for decades.

How long are you likely to live? Will your later years be blessed by healthy aging or marred by a host of illnesses? Certainly, the answers to those questions rest partly with the genes you've inherited. Yet at the turn of the millennium, more than a third of deaths in America were tied to smoking, poor dietary choices, and inactivity.

This report attests that the actions you take today matter. Simple lifestyle choices have an enormous impact on your longevity and quality of life.

What is essential for healthy aging? Full engagement with life. People who are curious, open, and eager to make connections with the world most enjoy the last decades of their lives. Even in the face of disabilities, these people seem to thrive and find joy despite their challenges. Depressed, anxious, or grumpy people in good health can also live long lives, but take far less pleasure in them. No magic pill, no secret potion can make us long-lived and healthy. But if you bring to your life appreciation and respect, and embrace aging with good humor, grace, vigor,

and flexibility, you will — at the very least — be happy to grow old.

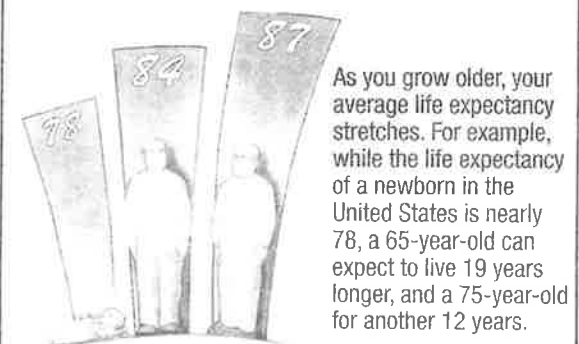
### *How long do we live?*

Nowadays, life expectancy at birth is nearly 78 years in the United States. This is a great leap forward from 1900, when the average newborn couldn't expect to reach age 50. Indeed, in the 20th century the life span of the human species — in developed nations — expanded more than it had in any century since the birth of mankind.

When the numbers are crunched more carefully, though, there are obvious differences between men and women and people of different races. A newborn boy born in 2004 or after can expect to live a bit more than 75 years, while his sister can expect to live to slightly more than 80. Life expectancy measured from birth is more than five years shorter for a black person than a white one, although the gap narrows to less than two years for those who survive to age 65.

If you live to celebrate certain milestones of age, your life expectancy stretches (see Fig. 1). In other words, the longer you live, the longer you're likely to live. Because many people who have chronic ailments or engage in behaviors that raise the risk of accidents or illness get cut from the herd much earlier, the oldest old are often remarkably healthy.

**Figure 1: Increasing life span**



Why did life expectancy increase so much in the 20th century in developed nations? Whether individuals develop a particular disease is usually determined by three things: their lifestyle (including diet and exercise), their environment (such as exposure to infectious microbes or toxins), and their genes. Increased life span surely has nothing to do with genes: our genes today are the same as they were a century ago. Instead, changes in lifestyle and environment are responsible.

Changes in the environment — such as better sanitation, the use of antibiotics, and many other improvements in medical care — can claim much of the credit. As for lifestyle, in developed nations, nutritional deficiency diseases largely were eliminated in the last century. Still, not all nutritional changes have been entirely for the better. In the United States, at the turn of the 20th century, most Americans lived on farms or in rural communities. We ate fresh, unprocessed food every day, and we worked hard physically. Today, our diets are less healthful in many ways, and we exercise less.

## The secrets of centenarians

Each year more Americans drift into the upper age brackets on census forms.

According to the 2000 census, there are more than 330,000 people ages 95 and over in the United States, while 85- to 94-year-olds number 3.9 million. Studies of people who reach the century mark note that their health is surprisingly robust despite advanced age. Once decline does set in for these centenarians, death follows fairly quickly. That's an attractive prospect for those who fear a drawn-out loss of health and independence in their waning years.

What's the centenarians' secret? Not surprisingly, genes play a role. A study of Swedish twins ages 80 and older attributed about half of the changes in mental function to genes. Other twin studies suggest genes are responsible for up to 35% of the physiological changes of age and that longevity itself is 25% to 35% inheritable.

But don't start viewing your genetic inheritance with rue or glee. Genetics is only part of the equation. Simple math tells you there's plenty of room left for the role that other factors — such as your diet, exercise routine and regular exams for illnesses — play in how you age.

## Extending your life

It's all very well to pile up statistics on average life span and speculate about factors in the aging process and the biological limits of life. Yet what does this tell you about your own life? Not enough. Clearly, more work needs to be done to crack the code of aging. But you don't have to wait until the final answers are in to take steps that may extend and enhance your life right now.

How well you age will help dictate how long you stay alive and how happy you are to do so. Whether or not your family is long-lived, the answers lie less in your genes than in your actions. Do you smoke? Do you eat well or poorly? Do you stay active? Are you a healthy weight? What ailments do you have now and, judging from family background and your current lifestyle, which ones are you likely to get?

If your answers seem discouraging, take heart. It's not too late to make changes. A 2007 study in the *American Journal of Medicine* focused on adults who adopted a healthier lifestyle during middle age. The researchers followed 15,700 adults (ages 45 to 64) for a decade and noted that 970 of these people embraced a healthier lifestyle by the sixth year of the study. These individuals ate five or more daily servings of fruits and vegetables, worked out at least two and a half hours per week, didn't smoke, and avoided obesity. Benefits appeared quickly. Just four years later, the group of individuals who made these four changes had a 40% lower rate of death for any reason and 35% fewer cases of heart disease compared with the participants who made fewer of these changes.

No matter what your age or stage of life, you have the power to change many of the variables

that influence disability and longevity. With these 10 steps outlined below, you can learn how.

### 10 steps toward a longer healthier life

1. Don't smoke.
2. Build physical and mental activities into every day.
3. Eat a healthy diet rich in whole grains, vegetables, and fruits, and substitute healthier monounsaturated and polyunsaturated fats for unhealthy saturated fats and trans fats.
4. Take a daily multivitamin, and be sure to get enough calcium and vitamin D.
5. Maintain a healthy weight and body shape.
6. Challenge your mind.
7. Build a strong social network.
8. Protect your sight, hearing, and general health by following preventive care guidelines.
9. Floss, brush, and see a dentist regularly. Poor oral health may have many repercussions, including poor nutrition, unnecessary pain, and possibly even a higher risk of heart disease and stroke.
10. Discuss with your doctor whether you need any medication—perhaps to control high blood pressure, treat osteoporosis, or lower cholesterol—to help you stay healthy.

### *Optimism and survival*

It's obvious that healthy people live longer than sick people. If optimism actually improves health, it should also boost longevity — and according to two studies from the U.S. and two from the Netherlands, it does.

The first American study evaluated 839 people in the early 1960s, performing a psychological test for optimism–pessimism as well as a complete medical evaluation. When the people were rechecked 30 years later, optimism was linked to longevity; for every 10-point increase in pessimism on the optimism–pessimism test, the mortality rate rose 19%.

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A more recent U.S. study looked at 6,959 students who took a comprehensive personality test when they entered the University of North Carolina in the mid-1960s. During the next 40 years, 476 of the people died from a variety of causes, with cancer being the most common. All in all, pessimism took a substantial toll; the most pessimistic individuals had a 42% higher rate of death than the most optimistic.

The two Dutch studies reported similar results. In one, researchers tracked 545 men who were free of cardiovascular disease and cancer when they were evaluated for dispositional optimism in 1985. Over the next 15 years, the optimists were 55% less likely to die from cardiovascular disease than the pessimists, even after traditional cardiovascular risk factors and depression were taken into account.

The other study from Holland evaluated 941 men and women between the ages of 65 and 85. People who demonstrated dispositional optimism at the start of the study enjoyed a 45% lower risk of death during a nine-year follow-up period.

### *Blue skies*

More study is needed to clarify the link between optimism and good health. It's likely that multiple mechanisms are involved. Personality is complex, and doctors don't know if optimism is hard-wired into an individual or if a sunny disposition can be nurtured in some way. It's doubtful that McLandburgh Wilson was pondering such weighty questions when he explained optimism in 1915:

*“Twixt the optimist and pessimist  
The difference is droll  
The optimist sees the doughnut  
But the pessimist sees the hole.”*

Today's doctors don't think much of doughnuts, but they are accumulating evidence that optimism is good for health. As you await the results of new research, do your best to seek silver linings, if not doughnuts.

# PRESERVING AND BOOSTING YOUR MEMORY

*10 steps to an  
optimal memory*



FROM  
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*Trusted advice for healthier life*

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**N**o matter what your age, it's not too late to take steps to prevent memory loss. A good place to start is with these strategies for improving your memory described in this special report. In addition, good health habits can reduce the risk of illnesses that might affect your memory as well as the likelihood that you'll need medications that could have adverse side effects. And preliminary studies have identified vitamins and at least one medication that may help ward off dementia.

Research shows that the following strategies may help preserve your memory.

## 1. Exercise

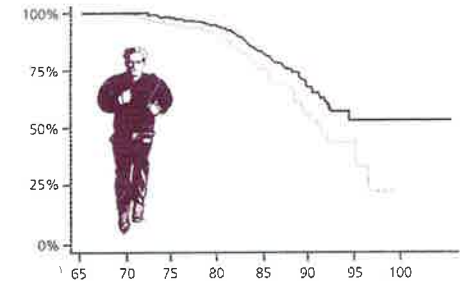
Physical fitness and mental fitness go together. People who engage in regular vigorous exercise also tend to stay mentally sharp into their 70s and 80s. A six-year study of 1,740 adults ages 65 and older, reported in the *Annals of Internal Medicine*, found that people who exercised more than three times a week had a lower risk of dementia than their sedentary counterparts (see Fig 1).

Exercise may help memory in several ways. First of all, it's good for the lungs, and people who have good lung function are sending a higher volume of oxygen through their blood vessels and into their brains. Second, exercise helps reduce the risk for diabetes, high cholesterol, high blood pressure, and stroke — diseases that can lead to memory loss. There is also some evidence that exercise leads to increased connections between brain cells and enhances neurotransmitter function.

Experts recommend that you build physical activity into your daily routine. Here are some examples:

- When possible, walk instead of driving.
- Set aside time each day for exercise — for example, a brisk half-hour walk around the neighborhood. For motivation, ask your spouse or a friend to go with you.
- Use the stairs instead of the elevator.
- Exercise at home, possibly with an exercise video.
- Plant a garden.
- Take an exercise class or join a health club.
- Swim regularly, if you have access to a pool or beach.
- Learn a sport that requires modest physical exertion, such as tennis.
- If you haven't been physically active recently, check with your doctor before starting any exercise program.

**Figure 1: Getting regular exercise fends off dementia**



People who exercise three times a week or more are less likely to develop dementia (a risk of 13 per 1,000) than people who exercise less than three times per week (a risk of 20 per 1,000).

Adapted from Larson EB, et al., *Annals of Internal Medicine* (Jan. 17, 2006), Vol. 144, No. 2, pp. 73–81.

## 2. Keep learning

In one study, the characteristic that correlated most strongly with good mental functioning in old age was a person's level of education. Experts think that advanced education may help keep memory strong by getting people into the habit of being mentally active. Regardless of your level of education, you, too, can be an active, life-long learner.

Exercising your brain with challenging activities is believed to stimulate communication between brain cells. Some ways of challenging your mind are obvious — for example, doing crossword puzzles, reading, participating in a book discussion group, playing chess, or taking classes. But you don't have to go to great lengths to find mental stimulation. Mental challenges also come from the unexpected occurrences that take you out of your daily routines and make you think. If you're still working, chances are that you get some of these curveballs thrown at you from time to time. But if you aren't working and your time is largely unscheduled, you may need to actively seek novel experiences and learning opportunities. Planning day trips or longer vacations, meeting regularly with friends and acquaintances, going to the theater or to museums, or just making a point of varying your routine can help keep your mind active and engaged.

### 3. Don't smoke

Smokers perform worse than non-smokers in studies of memory and cognitive function. Smoking increases the risk for stroke and hypertension, two other causes of memory impairment. No one knows whether smoking directly impairs memory or is merely associated with memory loss because it causes illnesses that contribute to poorer brain function.

Regardless of the exact nature of the link between smoking and memory loss, if you smoke, it pays to quit. Research shows that people who stop smoking have less cognitive decline than people who continue to smoke.

### 4. Drink alcohol only in moderation

While heavy drinking can harm your memory, moderate consumption of alcoholic beverages may actually be beneficial. Research suggests that moderate drinking reduces the risk of dementia. But excessive consumption of alcohol is toxic to neurons and is the leading risk factor for Korsakoff's syndrome, a disorder that causes sudden and irreversible memory loss. If you have been a heavy drinker, cutting back can prevent further memory loss and will usually lead to some recovery of damaged memory function.

### 5. Maintain a healthy diet

A nutritious diet rich in fruits and vegetables as well as healthy fats from fish, nuts, and whole grains is vital to maintaining brain health. Avoiding saturated fats (in meat and dairy) and trans fats (in commercial products with partially hydrogenated oils) will help keep your arteries clear and cholesterol levels healthy, and that in turn will decrease your chances of heart disease and stroke, including the small "silent" strokes that can damage brain function. Avoid excess calories to maintain a normal weight; this lowers your risk for illnesses such as diabetes and hypertension, which can impair your memory.

Eating a lot of fruits and vegetables can be especially beneficial because many are good sources of vitamins and other nutrients that may protect against diseases and age-related deterioration throughout the body.

### 6. Consider taking vitamins

If you eat a healthy diet, chances are that you are already getting most if not all of the vitamins that you need. However,

aging can make you vulnerable to vitamin deficiencies due to nutritional restrictions and malabsorption syndromes. Taking a high-quality multi-vitamin is a good start toward ensuring that you are getting what you need. Individual vitamin supplements can also play a role.

Certain B vitamins (B6, B12, and folic acid) are important for neuronal protection as well as facilitating the breakdown of homocysteine, an amino acid in the blood that, at high levels, is a risk factor for heart disease, stroke, and peripheral vascular disease. Deficiencies of B vitamins tend to become more prevalent with age. Work with your doctor to monitor your homocysteine level, and correct B-vitamin deficiencies with supplementation when necessary.

And despite the uncertainties, it's reasonable to speculate that a diet rich in vitamin E may help delay or prevent the development of Alzheimer's disease. So include foods such as wheat germ, vegetable oils, whole grains, and leafy green vegetables in your diet. The benefits of vitamin E supplements are less clear. The Alzheimer's Association recommends that people already diagnosed with Alzheimer's take vitamin E only under the care of a physician. One reason for their concern is that high-dose vitamin E can interfere with the blood's clotting ability, raising the risk of hemorrhagic (bleeding) stroke. If you take blood-thinning medication such as warfarin (Coumadin) or aspirin, you should be especially cautious and talk with your doctor before taking vitamin E.

### 7. Get a good night's sleep

Sleep is essential for memory consolidation as well as overall health. Although people vary widely in their individual sleep needs, research suggests that six to eight hours of sleep a night is ideal. Perhaps even more important than the amount of sleep is the quality of sleep. People with breathing problems during sleep, such as obstructive sleep apnea, can sleep for 10 hours per night but still feel unrested in the morning. Of course, for some people, getting a good night's sleep is easier said than done, particularly because insomnia becomes more common with age. But certain habits can help. For example, try the following:

- Establish and maintain a consistent sleep schedule and routine.
- Plan to do your most vigorous exercise early in the day. Exercising in the hours immediately before bedtime causes physiological changes that may interfere with sleep.

- Avoid coffee and other sources of caffeine (e.g., chocolate, many soft drinks, some brands of pain relievers, many types of tea) after midmorning, because caffeine is a stimulant that can keep you awake for hours afterward.
- Avoid excessive napping during the daytime. Prolonged napping can disrupt your natural sleep cycle and prevent you from feeling tired enough to fall asleep at night.
- Don't take sleeping pills unless nothing else works. If you do take a prescription sleep medicine, work with your doctor on using it effectively but only on a short-term basis, because sleeping medications can be habit-forming. In addition, like sleep deprivation, sleeping pills can cause memory loss.
- Some people find that drinking warm milk before bedtime helps them feel sleepy. Milk contains tryptophan, a chemical that may help you relax.
- Don't try to sleep if you're not tired. If you're still awake after about 20 minutes in bed, get up and read awhile to help you relax.
- If you experience persistent sleep problems, consult your physician so that you can identify the specific issues and get the necessary treatment.

## 8. Be social

According to the MacArthur study on aging and other research, social support — that is, close ties with others — can improve the cognitive performance of older people.

Social support can come from relationships with friends, relatives, or caregivers. There are several ways that social engagement may benefit your memory. Intellectually stimulating activities often go hand in hand with social interaction. Social relationships can also provide support during stressful times, reducing the damaging effects that stress can have on the brain.

## 9. Manage stress

When you're under a lot of stress, it's hard to concentrate. And not concentrating sufficiently is one of the main causes of poor learning and memory. Being under sustained stress for many weeks can impair your memory by altering brain chemistry and damaging the hippocampus. You can't control all the stressful events in your life, but you can control your reactions to those events to some degree.

One way to reduce stress is to work on gaining a greater sense of control over your life. There's no one-size-fits-all strategy for reducing stress. You have to find

strategies that work for you. For some people, taking a brisk walk or getting other kinds of regular exercise helps. Listening to music, meditating, talking to a friend, or engaging in a relaxing activity, such as gardening or knitting, can also help you cope with stressful situations. If you can't lower your stress level on your own, you might benefit from counseling.

## 10. Protect your brain from impacts and toxins

Head trauma is a major cause of memory impairment and a risk factor for future development of dementia. You can prevent head trauma by using the appropriate gear during high-speed activities and contact sports.

Wear seat belts when riding in motor vehicles. Car accidents are by far the most common cause of brain injury, and wearing seat belts greatly reduces the injury risk. Wear a helmet when bicycling, riding on a motorcycle, in-line skating, and skiing. Wear a mouth guard to lower the risk of a concussion by deflecting the force of a blow to the chin during contact sports such as football, ice hockey, soccer, basketball, rugby, and martial arts.

Reduce your exposure to toxic substances by taking sensible precautions. Before using paints, solvents, and pesticides, read the labels for safe handling. Test your home water supply and use a water filter to eliminate lead, if necessary. Avoid sanding, scraping, and otherwise disrupting lead paint on older homes. If you do plan to remove lead paint, hire a government-approved contractor for this work. Have your car and furnace serviced regularly to minimize carbon monoxide emissions.

## Improving everyday memory

Although there is no miracle drug for people with normal age-related memory loss, there are plenty of specific techniques you can learn to improve your ability to retain new information and skills. Doctors and other clinicians who work with people to improve their cognitive performance and memory have found these strategies to be very effective.

They aren't difficult to master. Indeed, many are simple things that you probably do already, but can benefit from doing more regularly. In other words, make an investment of time to reap the rewards of a sharper, quicker mind.