

ask the experts Staying Sharp

Memory and Aging



NRTA: AARP's Educator Community

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Memory and Aging

How many times have you walked into a room and forgotten what you came for? Searched in vain for keys that have mysteriously disappeared? Or forgotten the name of someone you should know?

Moments of forgetfulness happen to everyone, even the young. But as we get older, they may leave us wondering if we're losing our mental edge. The specter of Alzheimer's disease or some other debilitating dementia may even loom in our minds. Such feelings are natural—surveys suggest that cognitive dysfunction is one of the most feared health problems—but it can be comforting to know the facts, to understand the differences between normal memory changes and serious disease, and to take steps to improve your brain health when possible.

What's Normal, What's Not

What kinds of changes in cognitive function might be expected as a normal consequence of getting older? Is forgetfulness an inevitable

part of aging or a sign of a disease process? How can we tell if memory loss is due to Alzheimer's disease or some other problem that may be reversible? What can we do to maintain our mental acuity and to lower our risk of developing dementia?

One message is clear: Memory problems that interfere with day-to-day functioning should never be equated with “just getting older.”

Scientists are just beginning to sort out the answers to these questions. Much of the news from brain research is good. Mental decline is not inevitable as we age, experts say, and Alzheimer's disease is by no means a normal part of aging. While advancing age is often accompanied by some decline in cognitive abilities, which include memory as well as a range of other intellectual functions, the degree of change varies greatly among individuals.

Scientists understand some of the reasons for this variability, but many remain a mystery. Moreover, we can do many things that seem to impact our memory and overall brain health as we age.

Medical evaluation as early as possible is essential to identify potentially modifiable reasons for changes in cognition. Early treatment for any problem offers the best hope for staving off further decline.



Getting to Know Your Brain

Every aspect of brain function, whether it's solving a mathematical problem, hitting a ball with a club, or feeling the warmth of the sun, is represented in the brain as patterns of electrical and chemical signals traveling between nerve cells. Each thought, action, or sensory perception stimulates distinct sets of nerve cells and brain chemicals. Imagine each cell as a musician in an elaborate symphony orchestra, playing its individual notes in harmony with other sections of the orchestra to generate pieces of the musical score. The concerto that emerges from all the sections working together is nothing less than human behavior itself.

Nerve cells, or neurons, are the workhorses of the brain.



Their fibers, or axons, form connections called synapses with other neurons. When activated, a neuron sends low-level electrical currents down its axon, releasing brain chemicals (neurotransmitters) that diffuse across the gap where one neuron meets another and latch on to receptors on the receiving neuron. This sets off a cascade of changes inside the receiving cell that ultimately pass the signal along, like runners in a relay race.

When we experience something repeatedly, such as practicing a musical score, we are reactivating the same circuit of synapses. After several repetitions, the synapses physically change, enhancing the efficiency of the circuit and encoding the experience or behavior into a long-term memory.

Scientists believe that long-term memories are encoded within specific patterns of synapses in the cortex, the irregular folds and ridges on the surface of the brain. The frontal lobe of the cerebral cortex, especially the prefrontal cortex, is essential to

high-level mental functions such as reasoning and planning. The hippocampus, the amygdala, and neighboring structures within the temporal lobe form the core of the brain's memory-processing system. These structures are connected to the cortex by elaborate pathways of neural circuitry.

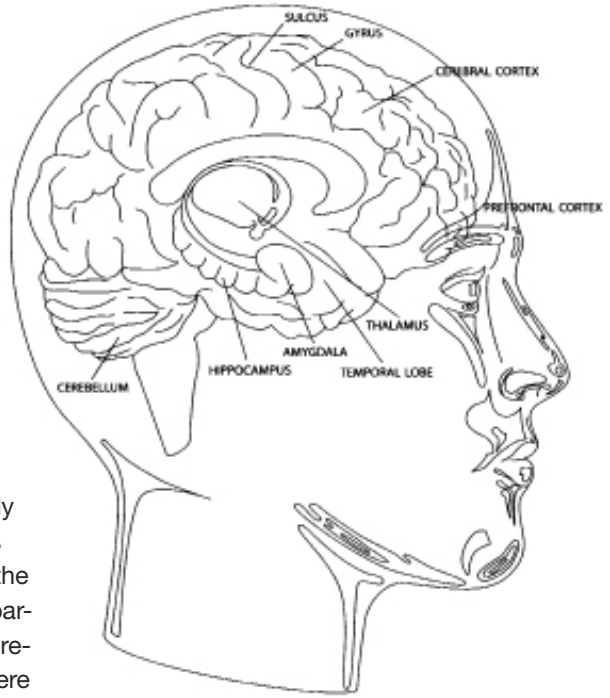
Where Memories Are Made

Memory is not a single process but rather a series of interrelated processes that begin when we learn something new or are exposed to new experiences. The brain registers new information, encodes it into nerve cell connections, and, in the right conditions, stores it for later retrieval. "Memory" generally refers both to the encoding of information and to the recall of that information when it is needed or triggered.

The brain seems to have different but overlapping systems for the two primary types of memory: declarative and nondeclarative.

▪ Declarative

(also called explicit) memories are those that we can recall consciously and describe verbally. They include the facts, people, places, and things that we encounter daily. Declarative memories primarily involve the brain's temporal lobes—the hippocampus in particular—and the prefrontal cortex, where higher intellectual functions seem to originate.



▪ Nondeclarative

(also called implicit) memory is the capacity for learning skills and procedures, including motor skills such as those used when playing golf or dancing. It involves brain structures outside the temporal lobes, including the amygdala and movement-related areas such as the cerebellum and the motor cortex.

Cognition vs. Memory

Many studies of brain aging address a range of cognitive abilities. Cognition includes not only remembering and forgetting but also abstract thinking, reasoning, attention, imagination, insight, and even appreciation of beauty.

Forgetting and Normal Memory Loss

As brain functions go, forgetting may be almost as important as remembering: It would be inefficient for our brains to try to retain every bit of information we're exposed to throughout life. How the brain sorts out what makes it into long-term memory and what doesn't is a matter of continuing debate, and many influences are involved, including our emotional state, stress level, environment, previous memories, biases, and perceptions.

Brain scientists believe that memory changes associated with normal aging may result from the subtly changing environment within the brain. With aging, the brain seems to lose cells in areas that produce important neurotransmitters, thus upsetting the brain's delicate balance of these chemical messengers. Other changes occur in the brain's white matter, made up of nerve-cell fibers that act as telephone cables for brain cells—the wiring through which communication with other cells takes place. Such changes

may therefore decrease the efficiency of cell-to-cell communication, which can make memory retrieval and other cognitive processes sluggish.

Scientists do know that as we get older, our ability to lay down new memories may be affected, making it more difficult to learn new things. It's not so much that we forget more easily but that we may take longer to learn information in the first place. Memory studies have shown that about a third of healthy older people have difficulty with declarative memory. Yet a substantial number of 80-year-olds perform as well as people in their 30s on difficult memory tests.

More good news: Even if it takes a bit longer for older people to learn something, once we do learn it, on average we retain it equally well no matter our age group.

In practical terms, this means that as we get older, we may have to pay closer attention to new information that we want to retain or use different strategies to improve learning and to trigger memories. (Please see “Keep Your Memory Sharp,” page 10.)

Tenets of Successful Brain Aging

We all know people who stay as sharp as a tack well into old age, or who seem to blossom creatively in the second half of their lives. A large and growing collection of scientific research focuses on determining what is different about people who tend to age successfully—that is, with minimal declines in cognition and memory. It turns out that they seem to share certain characteristics, described below, which may contribute to keeping them mentally sharp.

Physical activity is strongly linked with lifelong brain health. In particular, moderate aerobic exercise (such as walking, biking, or swimming) seems to sharpen memory skills. A recent study found that strength training also improves cognition in older women.

Mental exercise, especially learning new things or pursuing activities that are intellectually stimulating, may strengthen brain-cell networks and help preserve mental functions.

Longer formal education is associated with mental sharpness among older people, possibly because continued learning creates a neural reserve of denser, stronger nerve-cell connections that increase the brain's ability to compensate for age-related changes in neural structure and function. Better-educated people also may tend to lead brain-healthier lifestyles in general.

Self-efficacy, the sense that we exert some control or influence over our lives and the lives of others—that what we do makes a difference—seems to prevent cognitive decline. The reasons are not entirely clear, but some experts believe that self-efficacy may be related to a greater resilience to stress.

Social interaction—staying socially active and regularly engaging with family and friends—is an important predictor of healthy brain aging; and the flip side, social isolation, is associated with greater cognitive decline and other health problems. How social interaction benefits the brain is not well understood; one theory is that a strong

social network may facilitate new learning and help people better manage stress. People who are socially engaged are

also likely to be more active, both mentally and physically, which may help explain the apparent brain benefits.

Keep Your Memory Sharp

What may seem like a faltering memory may in fact be a decline in the rate at which we learn and store new information. Practice these memory skills to enhance learning and to make remembering easier:

Relax: Tension and stress are associated with memory lapses, and managing stress improves memory.

Concentrate: Your teachers were right: If you want to recall something later, pay attention.

Focus: Try to reduce distractions and minimize interferences. Multitasking taxes the brain's ability to focus and learn something well.

Slow down: If you're rushing, you may not be focused or paying full attention.

Organize: Keep important items in a designated place that is visible and easily accessed.

Write it down: Carry a notepad and calendar, and write down important things.

Repeat it: Repetition improves recall; use it when meeting new people and learning new things.

Visualize it: Creating a visual image of something you want to remember can improve recall.

Associate: New information can be encoded into the brain more strongly if it is associated with something that was previously learned well, so try to relate things you want to remember to something you already know.

When Is Memory Loss a Sign of Dementia?

Memory loss is one of the earliest symptoms of Alzheimer's disease and other types of dementia. Yet despite having some symptoms in common, dementia and what scientists call normal age-related memory loss have clear differences, both in the way symptoms might be experienced and in the underlying biological changes in the brain. While dementia involves a broad loss of cognitive abilities, normal age-related memory loss is primarily a deficit of declarative memory (memory for facts and events). Forgetting where the car is parked can happen to anyone, but forgetting that you took the car to get somewhere would be cause for concern.

Also important: Not all dementia is caused by Alzheimer's disease. Dementia is an umbrella term to describe conditions that affect intellectual and social functioning severely enough to interfere with daily activities. Alzheimer's disease is one form of dementia—probably the most common one. However, recent

studies have highlighted vascular dementia, a type caused by restricted blood flow to the brain, as a growing problem. Some experts believe that vascular dementia may account for as much as a third of all dementia, and “mixed dementia”—Alzheimer's plus vascular disease—may make up another third or so. Alzheimer's and vascular dementia share several risk factors, including high blood pressure, diabetes, obesity, and high cholesterol. Controlling these risk factors through lifestyle modifications and appropriate treatment could significantly reduce the incidence of dementia, experts say.

Typical Age-Related Changes or Cause for Concern?

Typical Age-Related Changes	Cause for Concern
Making a bad decision once in a while	Poor judgment and decision-making
Missing a monthly payment	Inability to manage a budget
Forgetting which day it is and remembering later	Losing track of the date or the season
Sometimes forgetting which word to use	Difficulty having a conversation
Losing things from time to time	Misplacing things and being unable to retrace steps to find them

Source: The Alzheimer's Association

Brain researchers are working hard to pin down where forgetfulness ends and Alzheimer's or other dementia begins. The question is difficult and the subject of much debate among experts on brain aging. One important clue from neuroscience research is that people with Alzheimer's disease are able to retain significantly less information after a period of delay than healthy people are (a difference in so-called delayed recall). That means that new information

may be learned, but little will be remembered even a few hours later.

Other studies have suggested that mild cognitive impairment (MCI), a condition marked by repeated lapses in short-term memory, may in fact be early-stage Alzheimer's in some patients—but probably not all. Distinct changes in memory that occur over the course of a year or two and can be verified with psychological testing are hallmarks of MCI. Such

changes, which a loved one often notices first, may be mild enough that daily functions are not significantly disrupted.

If you or someone you love is experiencing significant changes in memory or persistent forgetfulness that interfere with work or home

responsibilities, seek a doctor's help. Stress and fatigue can affect memory, and even if MCI is diagnosed, the cause may be something other than Alzheimer's, such as side effects from medications, depression, stroke or mini-strokes, or a head injury.



Taking Charge of Brain Health

Feeling old is a state of mind, many have said, and the cliché may be truer now than ever. Modern medicine has extended our life span and is now rewriting the old rules of aging. Indeed, “normal aging” may be an outdated and misleading concept, as how people age differs greatly, and many factors influence our quality of life as we get older.

Some of the changes to body and mind that are normally associated with aging may not be normal at all but rather the result of treatable health conditions or a lifetime of poor health habits. What may seem like declining mental fitness in older people may

actually be symptoms of an illness that should be medically evaluated and treated. For instance, the incidence of depression increases with age. Yet depression, a brain-based illness that can be successfully treated in most people, is often not recognized or treated properly. Many chronic health disorders, such as heart disease and high blood pressure, as well as many of the medications older people may need to take, can cause changes in mental functioning.

Experts say that only about 30 percent of physical aging can be traced to our genes; the rest is up to us. And we can do a lot to take charge of our

health and improve our quality of life, no matter how old we are.

We might prevent many of the scourges of aging if we followed the old-fashioned advice of eating right, staying active, and getting plenty of rest. In fact, that same advice, along with a few new insights from aging research, can go a long way toward keeping not only our bodies but also our brains healthy as we age. Good mental health—or cognitive fitness, as some have called it—is as important to overall quality of life as physical health is. And it demands similar attention.

Stay Socially Connected

Loneliness kills. A wealth of research evidence suggests that people with good social networks live longer and are physically and mentally healthier than people who are socially isolated. In fact, experts say social

connect-
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is one of
the most
important
predictors
of health
and inde-
pendence
in later
years.

A major
public
health
study
involving
more than
116,000
people
found that



those with strong relationships had less mental decline and lived more active lives free of pain and physical limitations. Other studies support the findings, including suggesting that people with the most limited

social connections are twice as likely to die during a given period than those with the widest social networks. Several small studies of patients with metastatic breast cancer or melanoma have shown an association between participation in support groups and longer life.

Older people may be more likely to lead solitary lives, especially if family and friends have moved away or died. Many experts believe that social isolation may create a chronically stressful condition that accelerates aging.

Combating loneliness requires effort, both in establishing new relationships and in deepening existing ones. Here are some suggestions:

- **Get involved** in projects that entail regular contact with others.
- **Investigate** the options available in your community and take advantage of programs and services that are offered at community centers, local offices for aging, and senior centers.

- **Seek out people** who may share your interests through involvement in houses of worship, clubs, hospital foundations, and nonprofit organizations.
- **Volunteer** your time for a cause in which you believe.
- **Get connected** while you improve your health: join a walking club, go to a church supper, or take an adult-education course in something that interests you.
- **Don't overlook** animal companionship; furry or feathered friends can bring great joy and purpose into our lives.

Diet

It's no secret that eating right is important to your health. In fact, the food choices we make throughout life can decrease—or increase—our risk for many of the diseases that cause premature death or disability in later years, including heart disease, cancer, stroke, and diabetes.

Consider, for example, these insights from three long-term studies involving almost

300,000 people that are being conducted by the Harvard School of Public Health:

- The incidences of breast and prostate cancer are higher in people who eat fewer vegetables.
- Colon cancer is more common in both men and women who eat more red meat.
- Diets high in fat, especially saturated fat and trans fatty acids, increase the risk of heart disease, diabetes, stroke, and some types of cancer.
- Eating lots of highly refined carbohydrates, such as commercially prepared cakes, cookies, crackers, and breads, increases the risk of obesity, diabetes, and heart disease.

Being overweight or obese is a leading cause of many of the diseases that may rob us of quality years in later life. While exercise is important in weight management, what we put in our mouths may be the biggest problem. Americans have a notoriously high-fat, high-salt diet, and most Americans don't eat enough whole grains, vegetables, fruits, or low-fat dairy products. Salt intake is a

growing concern because of its link to high blood pressure, and the U.S. government recently reduced the recommended daily maximum of salt to 1,500 milligrams. Most of the salt Americans consume comes from processed foods, so be sure to check labels for sodium content and avoid the saltshaker at mealtime.

Our need for energy to fuel body and brain processes does not change much as we age. We may require somewhat fewer calories, but we need just as many essential nutrients, or more in some cases. For example, our body's ability to produce vitamin D decreases with age, so we may need to consciously choose foods that are good sources of vitamin D, such as egg yolks, fortified dairy products, and liver.



Food sources—not vitamin supplements—are the best way to get the nutrients you need. In fact, some vitamin supplements, as well as many herbal preparations, can interfere with the actions of prescription medicines, so it's important to tell your doctor about any supplements you are taking. Supplements are unregulated, and many have not been properly studied to determine their effectiveness or possible side effects.

Sometimes physical problems can interfere with our ability to eat well. For example, missing teeth or gum

disease can make chewing difficult, and gastrointestinal problems such as constipation, diarrhea, and heartburn may limit what we can eat. Our senses of taste and smell may diminish as we age, and some prescription or over-the-counter medications can alter how food tastes. If we are depressed or lonely, we may not feel like eating or preparing meals. Significant changes in eating habits or appetite might be a sign of a medical condition or side effects of medications, and you should discuss them with your doctor.



Healthy Eating Habits

Eating right doesn't have to be complicated. Following the Food Guide from the U.S. Department of Agriculture, which emphasizes whole grains and fresh fruits and vegetables as the foundation for a well-balanced diet, is a good starting point. Other suggestions:

Drink eight to ten cups of fluids every day, and make at least five of them water. Limit caffeinated and alcoholic beverages, which act as diuretics and may flush nutrients from your body.

Reduce your intake of saturated fat (such as that in animal products) and replace it with monounsaturated fat (such as that in olive, canola, sunflower, safflower, and soybean oils).

Eliminate trans fatty acids, which are found in many processed foods and appear on ingredient lists as hydrogenated vegetable oils.

Reduce salt intake: Check labels for sodium content—processed foods are the biggest sources—and try not to add more salt from the shaker when you're eating.

When snacking, stick to healthy choices such as fruit, vegetable sticks, or whole-grain products.

Ask for and follow special diets recommended by your doctor or a nutritionist.

Join a cooking class to learn low-fat, healthy meal-preparation techniques.

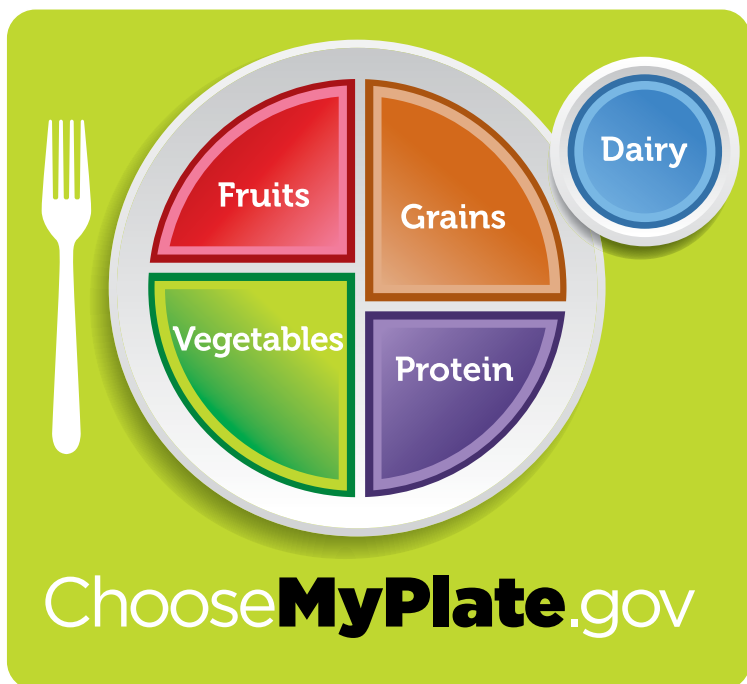
Make eating fun: Join family, friends, or community functions when possible.

Adapted from the National Institute on Aging

Cutting Calories

It's no secret that obesity is an epidemic in America, nor that carrying around extra pounds adversely affects health and

shortens life span. That's why public-health recommendation Number one is to maintain a healthy weight. But how low can one go for health's sake?



A great deal of evidence from animal studies suggests that restricting calorie intake by 30 percent or more significantly increases animals' longevity and appears to decrease the incidence of age-related disease. Applying these findings to humans is not so simple, though, and no one is recommending that people starve themselves to live longer. The National Institute on Aging is funding an ongoing clinical study to test whether normal-weight young and middle-aged people benefit

from a 20 percent decrease in daily calorie intake. Until results from that large study (called CALERIE) are in, the best advice is to avoid being overweight by making smart food choices and getting regular exercise.

Exercise

Exercise provides physical and mental benefits for people of any age, regardless of their current fitness level. Many experts contend that regular exercise is the most important thing we can do to improve

overall health and well-being and to prevent disease. Exercise increases levels of brain chemicals that encourage the growth of nerve cells, which may be why aerobic activity enhances memory skills and why moderately strenuous physical activity is strongly associated with successful brain aging.

Everyone can enjoy physical activity at little or no cost. It does not require a health club membership, fancy machines, or spandex clothing. All it takes is a little initiative.

Even moderate physical activity can impart significant health benefits. Recent studies from the Centers for Disease Control show that getting about 30 minutes of exercise a day—even if it is in 10-minute bouts—most days of the week can provide many of the same health benefits as far more strenuous activity. Day-to-day tasks such as gardening, walking the dog, and doing household chores count as moderate physical activity, so there's little excuse not to reap the rewards.

Studies in humans and animals have found that exercise has the following benefits:

- ✦ enhances memory and learning, as reflected by better performance on a range of cognitive tests
- ✦ improves mood and counteracts depression
- ✦ enlarges blood vessels so more blood and oxygen get into the brain
- ✦ boosts levels of brain-derived neurotrophic factor (BDNF), a growth factor that supports and nourishes brain cells
- ✦ amplifies the rate at which new nerve cells are generated in the hippocampus
- ✦ increases the number of glia, brain cells that support neurons and speed neural processing



For the most well-rounded fitness program and the greatest benefits overall, the National Institute on Aging suggests incorporating four types of exercises into your life:

- endurance exercises, such as walking and other aerobic activities, which increase stamina and may help delay or prevent diabetes, heart disease, colon cancer, and stroke.
- strength exercises with free weights or resistance weights, which help control weight and regulate blood sugar by increasing metabolism,

and may help prevent osteoporosis.

- flexibility exercises, such as stretching or yoga, which may prevent injuries and aid in injury recovery.
- balance exercises, such as standing on one foot, which can help prevent falls.

Use common sense when increasing your physical activity. If you haven't exercised for a long time, start slowly and build up gradually. You don't need to be a marathon runner; a 10-minute walk

around your neighborhood is a great way to start. Before you begin any new physical activity

or exercise program, speak with your doctor about what is right for you.

What Can Regular Exercise Do for You?

Exercise can:

- ✦ increase self-esteem and self-confidence
- ✦ reduce anxiety and stress
- ✦ improve mood and possibly alleviate depression
- ✦ improve sleep
- ✦ increase energy
- ✦ possibly help maintain healthy sexual function
- ✦ decrease the risk of heart disease and help prevent risk factors such as obesity and high blood pressure
- ✦ possibly improve cholesterol levels
- ✦ reduce body fat by increasing the body's calorie-burning efficiency
- ✦ slow the rate of bone loss with age
- ✦ enable the body to use insulin more efficiently
- ✦ lower the risk of certain cancers, including cancers of the breast, uterus, and colon
- ✦ improve cardiovascular health
- ✦ help control weight and prevent obesity

Sleep

Common Sleep Problems

There are more than 70 sleep disorders, and most can be managed effectively once they are recognized and accurately diagnosed. The most common ones are detailed on this sleep disorders chart.

Sleep Disorder	Who Is Affected	Common Features
Insomnia (almost always a symptom of another problem)	60 million Americans (40 percent of women; 30 percent of men) Incidence increases with age	Taking a long time to fall asleep Waking up many times each night Waking up too early and not getting back to sleep Waking up feeling tired
Obstructive Sleep Apnea	18 million Americans (most undiagnosed) Associated with aging More common in men	Loose tissue or sagging muscles block airflow to the lungs Loud snoring, gasping, and repeated interruptions in breathing lasting up to a minute Daytime drowsiness, irritability, sluggishness, poor concentration and memory

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Sleep Disorder	Who Is Affected	Common Features
Restless Legs Syndrome	12 million Americans Most common in the elderly	Runs in families Unpleasant crawling, prickling, or tingling sensations in the legs and feet Urge to move legs to relieve the sensation Leads to constant leg movement during the night
Narcolepsy	250,000 Americans Usually hereditary	Frequent, unexpected sleep “attacks” during the day, even when nighttime sleep is normal (In some cases) lack of muscle control in emotional situations; hallucinations; temporary paralysis when awakened; disrupted nighttime sleep

Source: National Institute of Neurological Disorders and Stroke



Tips for Good Sleep Hygiene

- ❖ Exercise regularly, but not within a few hours of bedtime.
- ❖ Eat a balanced diet, and don't eat heavy meals before bedtime.
- ❖ Practice relaxation techniques at bedtime, such as deep breathing, visualization, or meditation.
- ❖ Avoid caffeine, nicotine, and alcohol in afternoon and evening hours.
- ❖ Set regular bedtime and waking hours.
- ❖ If you do not fall asleep within 20 minutes of going to bed, get up and do something else until you feel tired.
- ❖ Keep a sleep journal to track activities, food and drink, emotional circumstances, or other factors that might influence how well you sleep.
- ❖ Keep a steady room temperature in your bedroom (not too warm).
- ❖ Avoid reading, conversation, and watching television in bed.
- ❖ Make the bedroom a safe place, with locks on the door, a smoke alarm, a telephone, and good lighting within reach of the bed.
- ❖ If you snore, avoid sleeping on your back, and elevate your head.
- ❖ Get treatment for allergies, colds, and sinus problems.
- ❖ Wake up to the sun, or use bright lights in the morning to reset the body's biological clock.
- ❖ Do not lie in bed once you are awake in the morning.

Source: National Institute of Neurological Disorders and Stroke

Checklist for a Brain-Healthy Lifestyle

Do:

- ✓ Exercise your body regularly and get involved in physically active leisure pursuits.
- ✓ Keep your mind exercised! Engage in active learning throughout life, and pursue new experiences.
- ✓ Stay socially engaged with friends, family, and community groups.
- ✓ Maintain a positive attitude and a sense of control over your life.
- ✓ Take steps to manage stress.
- ✓ Eat a brain-healthy, balanced diet rich in antioxidants and omega-3 fatty acids, and consider taking a multivitamin supplement that includes antioxidants and folate.
- ✓ Mind your numbers: Lose any extra pounds, lower your cholesterol if it is high, and keep your blood glucose and blood pressure under control.
- ✓ Get adequate sleep.
- ✓ Get proper medical attention and treatment for any underlying health problems.

Don't:

- Drink to excess, smoke, or use illicit drugs.
- Ignore sudden changes in mental status. However, don't be overly concerned about normal slips of memory such as forgetting names or where you put the keys.
- Put off going to the doctor if you notice changes in your physical or mental health.
- Overlook the possibility of drug interactions that can affect mental functioning, especially if you are taking more than one prescription medication.
- Become isolated in your home.
- Think you're too old to take up something new!

Conclusion

Brain science is making tremendous progress that helps us understand just what happens to memory and other cognitive functions as we age. Although many questions remain, it is clear that normal age-related memory loss is distinct from Alzheimer's disease and other dementias. We can do many things every day that may help preserve our mental abilities, and these strategies can help us enjoy a higher quality of life as we get older. They may even help prevent cognitive impairment and dementia.



Resources

AARP

601 E Street, NW
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Toll-Free Nationwide: 1-888-OUR-AARP (1-888-687-2277)
Toll-Free Spanish: 1-877-MAS-DE50 (1-877-627-3350)
International Calls: 1-202-243-3525
www.aarp.org
Email: member@aarp.org

Alliance for Aging Research

2021 K Street, NW, Suite 305
Washington, DC 20006
202-293-2856
www.agingresearch.org
Email: info@agingresearch.org

Alzheimer's Association

225 N. Michigan Ave., Fl. 17
Chicago, IL 60601
1-800-272-3900
www.alz.org
Email: info@alz.org

Alzheimer's Disease Education and Referral Center: National Institute on Aging

P.O. Box 8250
Silver Spring, MD 20907
1-800-438-4380
www.nia.nih.gov/alzheimers

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1-800-222-2225
www.nih.gov/nia

National Institute of Neurological Disorders and Stroke: NIH Neurological Institute

P.O. Box 5801
Bethesda, MD 20824
1-800-352-9424
www.ninds.nih.gov

National Sleep Foundation

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