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Retain Your Brain

How to age-proof your most valuable asset

By Marc Milstein, PhD

It's understandable that we're desperate for a quick fix to one of the greatest collective health fears we have: Losing your memory, and your financial assets, because of having your mind go from a high-functioning piece of biological wizardry to a lump of gray matter that struggles to remember what day it is.

When I say "wizardry," I'm not exaggerating. A healthy brain is an amazing thing. It can effectively learn, remember, manage emotions, analyze, make good decisions, create, and innovate. A healthy brain can also let you do the electric slide, laugh (at people doing the electric slide), navigate, and hit a perfect golf shot (well, sometimes). A functioning brain is essential for being the best version of you.

So can we prevent, or at least slow, the aging of our brains?

More and more research points us to a compelling conclusion and powerful message: that we—not our genes—can have control over our cognitive health today and the destiny of our brains.

The action steps you take to protect your brain will optimize your brain health today and tomorrow so you can always be the best version of yourself.

What We'll Cover

- Your age vs. your brain's age
- The importance of brain health
- How to age-proof your brain

"We have strong evidence that simple lifestyle interventions can dramatically improve brain health and lower the risk of disease today, tomorrow, and in years to come."

—Marc Milstein, PhD

Your Age vs. Your Brain's Age

Our brain's age often isn't the same as our chronological age. For example, a person could be 60 years old and have a brain age of 50 or perhaps 70. You have significant control over your brain's age.

While not as comprehensive as a brain scan or evaluation by a neurologist, a few basic questions can help you get a sense of your brain's age.

1 How Well Can I Manage My Day?

It's not uncommon to misplace our keys or forget an appointment occasionally, but any signs of increasing forgetfulness should be addressed. A condition called Mild Cognitive Impairment (MCI) impacts approximately 12 to 18% of those over age 65. MCI isn't dementia but a sign of memory issues and decreasing cognitive function. It can be a precursor and raise the risk of developing dementia.[1]

2 How Well Can I Remember Important Information?

The notion that significant memory loss is a normal part of the aging process is a myth. Recall can also be a use-it-or-lose-it skill. Since most of the things we want to recall are stored in our phones, we need to be more intentional about remembering information without relying on them. Practicing recall further strengthens our memories.[2]

3 How Well Can I Move and Maintain Balance?

Our brain controls our balance, which is another use-it-or-lose-it skill. As we get older, we tend to participate in fewer activities that keep our balance strong.[3] Loss of balance increases the risk of falls, which can lead to head injuries. Head injuries, in turn, increase dementia risk.

4 How Fast Can I Walk?

Studies have shown that walking speed is correlated with memory function. You don't need to power walk everywhere you go but consider short bursts of brisk walking, even for a couple of minutes a day. A study found that just nine minutes per day of intense walking can improve memory.[4]

5 How old do I feel?

There's a powerful connection between your perspective and healthy aging. Studies show that people who have a positive attitude toward aging can reduce their chances of developing dementia by 50%.[5]

You might be wondering how to answer these questions? For example, "Walking fast or balancing relative to what?" Rather than trying to compare your ability to a universal standard or other people, answer the questions according to trends over time. For example, are you able to walk as fast and long as you were a few years ago, or have you noticed a significant slowdown?

Mild cognitive decline can be a natural part of aging and isn't a reason to panic. But if your answers indicate you may be experiencing more than that, consider having an evaluation by healthcare professional.

The Importance of Brain Health

One of the things that make a brain age prematurely is the buildup of "brain trash" and toxins. Brain trash is a by-product of the work your brain cells do. Your brain cells are like a hustling, bustling Manhattan.

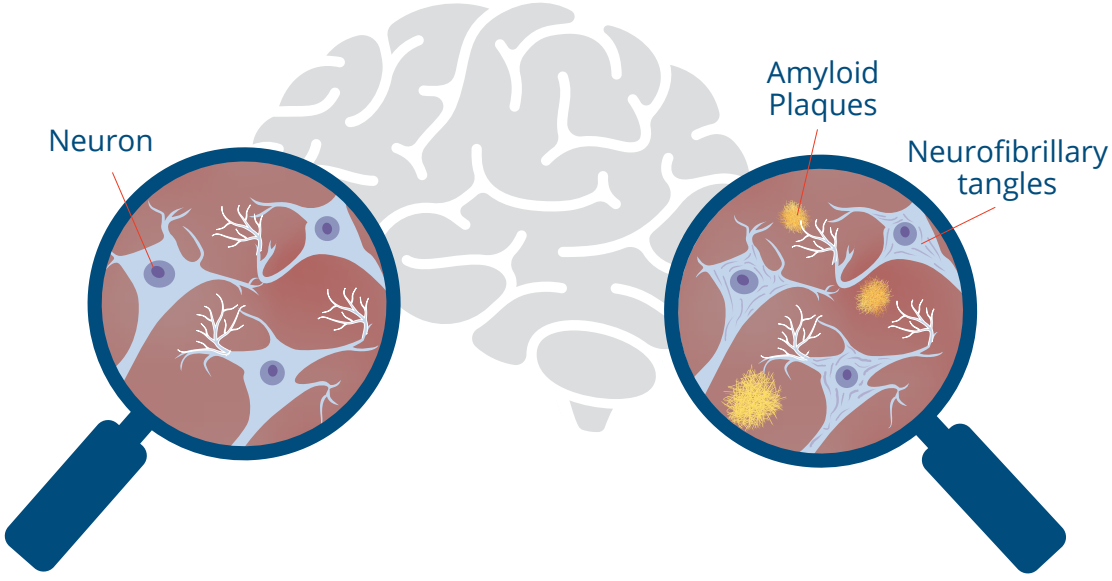
Just like a city gets dirty, your brain does too—filled with residual waste from chemical reactions, environmental toxins, old, damaged cells, and that are no longer needed.

Your three-pound brain makes five pounds of trash a year. Normally, it's recycled or flushed out, but if not, the trash can build up, causing diminished focus, loss of productivity, and a drastic reduction in overall energy.

Brain Trash

- A byproduct of the work your cells do
- A 3lb. brain makes 5lb. of trash per year
- The more built-up trash, the "older" the brain

When Brain Trash Builds: Plaques and Tangles



Many different types of trash can build up in the brain. Plaques and tangles are the two most common forms of brain trash found in Alzheimer's disease. Plaques and tangles can stop communication between nerve cells which can be a part of what causes memory loss.

How Brain Health Can Affect Lifestyle

A youthful, healthy brain is more focused, capable of learning and retaining information, and resilient. But the average human brain shrinks by approximately 5 percent per decade after the age of 40. A shrinking brain can have a devastating impact on brain function.

Healthy Brain Motivators

List a few things you look forward to doing as you age. Many people plan to travel, volunteer, work, socialize, and spend time on hobbies.

1. _____
2. _____
3. _____

Consider how an unhealthy brain could prevent this. This list can be a motivator to keep your brain healthy.

The Financial Cost of an Unhealthy Brain

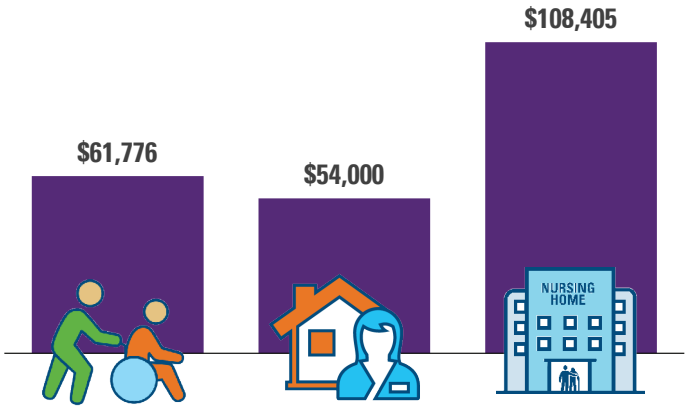
According to the Alzheimer's Association, people 65 and older survive an average of four to eight years after a diagnosis, yet some live up to 20 years with the disease.[6] Since Alzheimer's is a progressive disease, the type, level, and costs of care needed will intensify over time.

In most cases, memory-care facilities aren't covered by Medicare, and placing a family member in a specialized facility can be extremely expensive. Medicaid may pay for nursing home care for patients who a) require that level of care and b) meet the program's financial eligibility requirements. Requirements may vary by state and may change based on the patient's marital status.

The total lifetime cost of care for someone with dementia is estimated to be $392,874 in 2021 dollars.[7] These costs could include home modifications, lost income, legal fees, and hospice.

The Progression of Care Costs

Annual National Average Cost



Source: Cost of Care Survey, Genworth, 2022

ACTION STEPS

Financial preparation for future cognitive decline concerns

1. **Talk to your financial professional**
   They can help plan for the financial costs of cognitive impairment. They may know an elder-care attorney who can create documents such as a durable power of attorney, healthcare power of attorney, and trusts.
2. **Talk with a Life-Care Manager**
   They help evaluate the needs, costs, and quality of medical care, home modifications, in-home care, and various care facilities. They can also identify potential financial resources including Medicare, Medicaid, veterans' benefits, long-term care insurance, and community-based programs.

How to Age-Proof Your Brain

Here are some simple, evidence-based steps that can significantly protect your brain

Sleep: Your Greatest Ally in the Fight to Preserve Your Brain

Sleep is perhaps the greatest ally in the fight to preserve your brain —and quality, deep, restorative sleep is crucial to your brain health.

Sleep Cycles

When we sleep, we go through three stages of sleep that make up a 90-minute cycle. Each cycle creates various levels of brain electricity:

1. **Light sleep:** Electrical activity is similar to the amount when you're awake
2. **Deep sleep:** Very low electrical activity relative to light and REM sleep
3. **REM sleep:** (Rapid eye movement) sleep: A higher level of electrical activity than when you're awake

7-9 hours/night

Most people need between seven and nine hours of sleep for optimal brain health, but the number of hours is specific to you.

There's a rare group of people who can function at high physical and mental levels on significantly less sleep. They're called "short sleepers" and likely account for less than 1 percent of the population.[8] Some people who think they're short sleepers are actually sleep deprived—which makes them vulnerable to all the issues that come with lack of sleep.

If you're sleeping more than nine hours a night, you should be evaluated by a physician. Excess sleep can be a sign of conditions such as heart disease, diabetes, and depression, and can raise the risk of memory issues, back and neck pain, and obesity.

SLEEP: ACTION STEPS

Here are some strategies to improve sleep and keep your brain young and your immune system strong.

1. **Sleep in True Darkness**

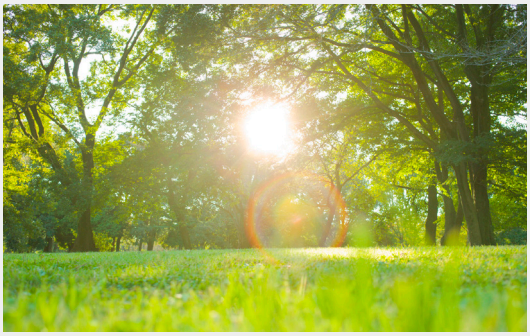
   Is your bedroom completely dark or just kind of dark? Bedrooms are often filled with cell phones, nightlights, televisions, and computers.

   The little bits of light they emit can keep your brain from reaching the deepest, brain-boosting levels of sleep. Unplug these devices before bed or put them in another room. You could also hang blackout shades and curtains.

2. **Chill Out for Better Sleep**[9]

   Most people find it easier to fall asleep in a cool room, and it has to do with your sleep cycle. The first phase of the sleep cycle, light sleep, lasts about 20-30 minutes.

   During this time your brain lowers your core body temperature to transition from light sleep to deep sleep. Slightly reducing the temperature of your bedroom can help you reach deeper, brain-boosting sleep.



3. **Get Out Early**

   Prepare for a good night's sleep by getting natural light first thing in the morning. Spending 10-15 minutes outside walking your dog, checking the mail, or taking a stroll around the block will set your brain clock.

You Are What You Eat (And So Is Your Brain)

Your gut is a lot like a second brain. It contains 500-million brain cells that communicate with your brain. This communication is called your gut-brain axis. What happens in the gut can impact mood, memory, and how we age.

What we eat can calm or increase inflammation, help us lose or make us gain weight, and even improve our brain function.

Research points to a Mediterranean-type diet as being optimal for brain health. This diet is filled with fruits and vegetables, bursting with beans, nuts, and whole grains, and features fish, seafood, and healthy fats such as olive oil. The Mediterranean diet lowers the risk of Alzheimer's disease even in those with a genetic risk factor for the disease.

DIET: ACTION STEPS

1. **What to eat**

   A Mediterranean diet is relatively easy to follow. Diets that are too strict generally aren't sustainable for the long term. Instead of limiting the foods you love, you can add heart- and-brain healthy foods by making key substitutions and additions. Just make sure you include these five items (or most of them) in your shopping cart. If you're already consuming most of them, you're headed in the right direction:

2. **What not to eat**

   Results of a study published in the journal Neurology suggest that combining processed meat such as sausage or cured meat with a starchy carbohydrate such as a potato or sugary snack increases the risk of dementia.[10]

   You might be saying, "You're taking away everything that I love to eat!" Don't despair! In that same study, when people ate heart- and-brain healthy foods at the same time as highly processed/sugary foods, it helped lower their risk for dementia.[10]

Beans
Red kidney beans and pinto beans

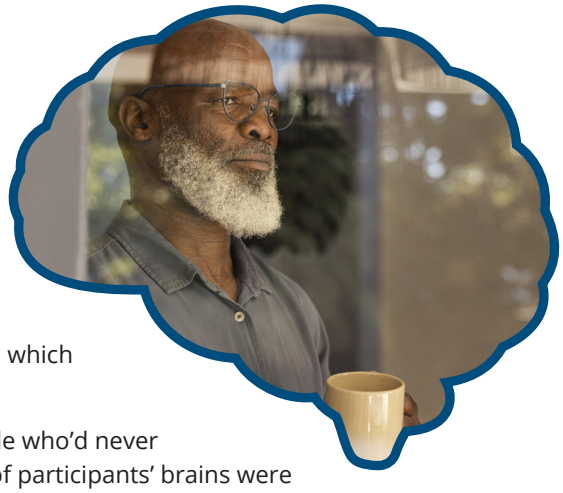
Extra Virgin Olive Oil

Fruits and Vegetables
Leafy greens like kale, spinach, and brussels sprouts. Colorful produce like eggplant, bell peppers, tomatoes, blueberries, strawberries, and blackberries

Nuts
Walnuts, pine nuts, pistachios, and almonds

Fish
Cold water fish: Salmon, herring, mackerel, cod, trout, tuna

The Stress Surprise



We hear it all the time: Stress is bad. But some stress is good for you because it focuses the brain and can even slow down brain aging. How do we find the right amount of stress to keep our brains and immune systems running like finely tuned Ferraris?

A study found that stress and unhappiness can be caused by our minds wandering. When our minds wander, they often go to unhappy, stressful, and anxious thoughts about the past or future. An antidote to this is being present, which is associated with greater happiness and less stress.

One way to be present is to practice mindfulness. A Harvard study asked people who'd never practiced mindfulness to do so for 30 minutes a day for eight weeks. Pictures of participants' brains were taken before they started, during the eight weeks, and after.[11]

Throughout the study, the participants' brains changed. The hippocampus grew—that's the part of your brain that allows you to learn new things. The prefrontal cortex got stronger and longer—that's the part that calms your stress response. And the amygdala shrank—that's the part that manages our fight-or-flight stress response.

We can't control much of what surrounds us, but we can gradually become experts at managing stress.

STRESS: ACTION STEPS

1. Breathing Exercise

There are many mindfulness exercises, and they often involve breathing. Here's one that's simple and effective.

1. Say to yourself or out loud, "breathe in calmness" and inhale through your nose
2. Say "breathe out anxiety" and exhale through your mouth
3. Try to focus on the breath going in your nose and out of your mouth
4. If you're having trouble focusing, place your hand on your stomach and pay attention to your breathing for five seconds. Feel the rise and fall of your abdomen with each breath.

If 30 seconds feels like a long time, that's okay; it may take practice. If you can do 30 seconds, try to add another 30 seconds tomorrow. Think of it like lifting weights and increasing your reps.

STRESS: ACTION STEPS

2. Change Your Perspective

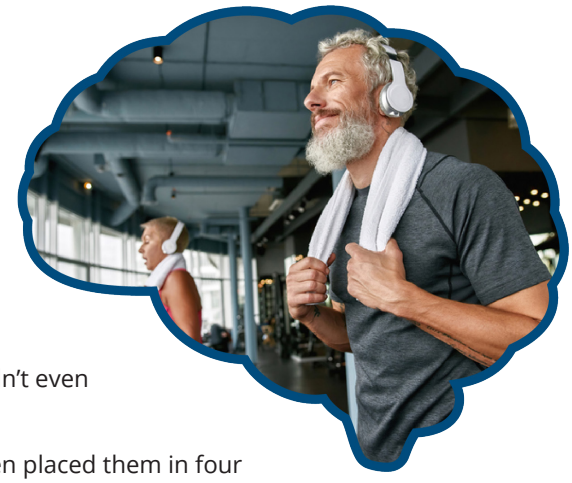
Stress can be quite useful—and you can train yourself to view stress in that light.

Even a bit of stress from sitting in traffic or standing in line at the grocery store can be beneficial.[12] These bursts of acute stress can be healthy for the brain. So next time you're in the "10 items or less" lane at the grocery store, and the person in front of you has 30 items, thank them, and shift your perspective on stress as something that can be beneficial.

3. Rose, Thorn, Bud

Take a moment and think of the best thing that happened in the last 24 hours. That's your rose. Next, think of the most challenging part of the previous 24 hours. That's your thorn. Now think of something specific you are looking forward to in the next 24 hours. That's your bud. This technique was shown in a 2019 study to be an effective means to manage stress and boost happiness.[13]

Get Moving



Exercise is like a miracle drug for the brain. If a drug generated the same brain benefits that exercise does, there would be lines stretching miles long to obtain it.

Lowers Risk of Dementia

A study at Cardiff University in the UK found that simply walking 30 minutes a day lowered the risk of dementia by about 65 percent.[14] Those 30 minutes didn't even have to be done consecutively.

Similarly, another study asked 50-year-old women to use an exercise bike, then placed them in four categories based on endurance. The categories ranged from "high physical fitness" to "could not finish the fitness test." Forty years later the researchers found:

- 5 percent of the women in the high physical fitness category developed dementia
- 25 percent of the women in the moderate and low fitness categories developed dementia
- 45 percent of the women who couldn't finish the fitness test developed dementia

Women who were classified as highly physically fit at 50 years old were 90 percent less likely to develop dementia than the group that couldn't finish the test.

Improves Memory

A study published in the Journal of Alzheimer's Disease investigated two groups of adults age 60 and older. For a year, the group did aerobic exercises while the other group just stretched. Afterward, the aerobic exercise group showed a whopping 47 percent average increase in memory scores while the stretching group saw no memory improvement.

Small Changes Can Make a Big Difference

How much exercise is required to protect your brain? Do you need to drop everything and train for a triathlon? Fortunately, no. It turns out even small changes can have a big impact.

The next time you're given a choice between stairs and an elevator or escalator, consider this: A study found that people ages 19-79 who consistently took the stairs had a younger-looking brain.[15]

"The secret to a healthy brain is just a couple (or few thousand) steps away each day."

—Marc Milstein, PhD

GET MOVING: ACTION STEPS

You might be saying, "I get it! Exercise is good for my brain. But how do I make exercise a habit instead of that exercise bike or treadmill becoming a very expensive coat rack?"

Making Exercise a Habit: CARS (Cue, Action, Reward, Support)

1. Cue: Setup Visual Reminders

Exercise becomes a habit when we make it a default behavior. We can set up a cue that drives us to take action to stick to an exercise program.

Placing your walking shoes where you can't miss them will remind you to take your daily walk. A smartwatch that reminds you of your steps can be another visual cue.

2. Start Small

When it comes to exercise, it's best to start small and build.

For example:

- Walk in place during TV commercials or before the next episode of a program you're streaming
- Stand and/or walk during phone calls
- Park farther away from the grocery store
- Do 10 jumping jacks every hour (you can set your smartphone to remind you to do this)

3. Reward: Do Something You Enjoy

Exercise must be fun and rewarding, or you likely won't make it a habit. Pairing exercise with something you enjoy can be very helpful, such as exploring a new hiking trail or learning a new sport.

Variety is the spice of life—especially when it comes to fitness. The body can acclimate to the same activity, and results will diminish. The same is true of the brain. Keep your workouts fun and fresh.

4. Support: Find a Workout Buddy

Active participation in a team sport has clear brain health benefits.[16] Not just playing but socializing boosts the brain. If team sports aren't your thing, find a workout buddy to keep you company—and accountable.

You're going to have challenges when you're establishing your exercise habit but stick with it. If you can't fit in a 40-minute walk, three short (think 10-15 minute) walks a day can reap significant brain benefits.

Cross-Train Your Brain

Hopefully, by reading this workbook, you've learned some new information. That very action was protecting your brain: learning new information plays a significant part in disposing of brain trash via a "power wash" that uses one of your body's most effective brain cleansers: norepinephrine.

Norepinephrine Takes Out the Trash

Norepinephrine is a hormone and neurotransmitter that regulates heart rate, attention, memory, and cognition.[17] Maintaining a healthy brain and strong memory is not all about Sudoku, crossword puzzles, and brain games. Those can be fun, and they have brain benefits, but they aren't the only things we can do for brain exercise.

When you learn something new, your brain squirts norepinephrine from a brain structure called the locus coeruleus.[18] The norepinephrine breaks up the waste and trash in your brain so it can be excreted when you sleep. This keeps your brain young, healthy, and able to make new connections.

Myelination Speeds Up Processing

Learning helps produce new myelin, a coating around your brain cells that makes the electrical signals travel faster. Myelin is like the insulation you see around an electrical wire. The thicker the myelin coating gets, the more easily you can learn new things.

Embrace the Challenge of Learning

Learning a new language or a musical instrument is good for your brain. A study found that being bilingual or a musician at any age made the brain more efficient in day-to-day memory tasks.[19] But to get a real good spray of norepinephrine, embrace the challenge, and sometimes frustration of learning something new.

"Study after study has found that learning new things significantly lessens the risk of memory loss and slows down brain aging."

—Marc Milstein, PhD

CROSS-TRAIN: ACTION STEPS

1. **Mix It Up**

   Approach learning something new the way you would fitness training. For instance, you wouldn't go to the gym and only exercise your forearms. You want to work out different muscles on different days and work on your aerobic fitness as well as building muscle.

   The same goes for the brain. Learning a language or a musical instrument versus a sport exercises different parts of the brain. You can cross-train your brain by mixing mental and physical learning activities.

2. **Try the Pomodoro Method**

   This time-management technique was developed in the late 1980s. To try it, begin by eliminating all distractions: silence your cell phone and put it out of sight along with any other distractions. Set a timer (not on your cell phone!) for 20 minutes and focus on just one important task. If your mind wanders, bring it back to your task. Commit to 20 minutes of distraction-free work.

   Take a five-minute break and do it again. If you're having trouble reaching 20 minutes without distraction, try just 10 minutes. Increase the time until you hit 20 minutes of pure focus. You can go past 20 minutes but that's the minimum. There's no magic formula for the number of reps you do, as it's based on how much work you need to get done.

   Don't forget that five-minute break, though. Your brain needs a little distraction to reengage focus; it can be as simple as standing up and walking around the room or a quick stretch.

3. **Put Away Your Phone**

   Our phones are amazing, wonderful, and powerful, but they can be a distraction. The information on them can be important and meaningful or it can be a waste of time.

   Just seeing your phone can be enough to make your brain wonder what you're missing—did you just get a text message, a post, or an email? This kind of distraction can have a significant impact on your brain performance.

   If you want to get in the deepest levels of learning focus, place your phone (or computer or tablet) out of sight, so it is out of mind.

Friendships Can Help Protect Your Brain

Can going to a dinner party preserve your memory? People over fifty-five who regularly participated in, or hosted, dinner parties or other social events had a lower risk of losing their memories.[20] It wasn't because of what they ate or where they went; it was the effect of the repeated social connection with other people.

How important is social interaction to our mental and physical health? We're used to hearing about the dangers of smoking and obesity, but loneliness has the same impact on mortality as smoking fifteen cigarettes a day, making it worse for us than obesity.[21]

Additionally, loneliness is associated with poorer decision-making, attention, cognitive ability, and brain shrinking and aging.[22]

It's normal to feel lonely from time to time, but there's a greater risk of loneliness as we age, as family and friends pass and children move away. That persistent loneliness makes us feel socially isolated.

FRIENDSHIP: ACTION STEPS

1. **Spend Time With Family and Friends (Especially Friends)**

   A study investigated whether people find more joy in being with their friends or family. (In this study, family was defined as people who share a home.) They found people were happier when they spent time with their friends instead of family.[23]

   One reason people didn't feel the same happiness and joy with family members that they did with their friends involved how they spent time together. Activities with family members were more likely to involve chores: doing laundry, washing dishes, taking out the trash, doing housework, and paying bills.

   We tend to reserve fun activities for our friends. We need to try to ensure that family time isn't just about chores and to-do lists.

2. **Get a Hearing Check**

   People with mild untreated hearing loss are twice as likely to develop dementia than those without hearing loss. Those with severe loss are five times as likely to develop dementia.[24]

   There are a few reasons for this connection between hearing and memory loss. First, hearing loss can lead to social isolation and a lack of engagement and learning.

   There's also a theory that hearing loss causes changes in brain activity that can promote abnormal proteins that are the hallmark of brain trash.[25]

   Using a hearing aid doesn't just improve hearing, it protects the brain, too. If you know someone who needs a hearing aid but is resisting getting one, you can tell them they aren't just improving their hearing; they're also protecting their brain.

"It's a relief that having fun and hanging with friends protects your brain."

—Marc Milstein, PhD

To Summarize

First, your brain age may not be the same age as your chronological age. Second, your brain health can impact your finances and lifestyle. Third, it's possible to age-proof your brain with brain-healthy habits.

The Bottom Line

Many people use the word "senile" to describe what happens when someone has reached a certain age and their mind (especially their memory) doesn't function like it used to. You may say, "Oh, that's part of aging. There is nothing anyone can do." But there's a lot you can do. If you take care of your brain properly, it should keep up with your body as you age. A sharp mind into old age isn't just a bit of luck—it's within reach for most of us.

Next Steps

- Within a week, choose an area to focus on: sleep, diet, stress, exercise, or learning
- During the next month, begin implementing the tips suggested in that area
- Talk to your financial professional about any financial issues related to future cognitive decline concerns

"A sharp mind into older age isn't just a bit of luck—it's within reach for most of us"

—Marc Milstein, PhD

Marc Milstein, PhD

Dr. Marc Milstein is a leading scientific researcher on neuroscience, health, and happiness. His insights provide science-based solutions to keep the brain healthy, lower the risk of dementia, boost productivity and maximize longevity. He earned both his Ph.D. in Biological Chemistry and his Bachelor of Science in Molecular, Cellular, and Developmental Biology from UCLA.

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