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Hypertension and Brain Health — How High Blood Pressure Damages Your Brain

Analysis by Dr. Joseph Mercola | January 08, 2026

STORY AT-A-GLANCE

- Nearly half of U.S. adults have undiagnosed hypertension, which increases risks for stroke, heart attack, and early brain impairment due to reduced oxygen and nutrient delivery to neural tissue
- Early hypertension triggers rapid cellular damage, including endothelial aging, neuronal energy loss, myelin disruption, and blood-brain barrier leakage, all of which accelerate inflammation and cognitive decline even before symptoms appear
- Long-term high blood pressure leads to changes such as white matter hyperintensities, microbleeds, and brain volume loss. These findings are strongly linked to slower processing, stroke risk, and dementia
- Dementia risk rises with midlife hypertension, and older adults with high blood pressure show accelerated brain aging; regular monitoring beginning around age 40 helps reduce long-term cognitive decline
- Treatment can reverse some early damage, while lifestyle strategies such as diet changes, exercise, and better sleep significantly lower blood pressure and help protect long-term brain health

According to the American Heart Association (AHA), almost half of all adults in the United States have high blood pressure, also known as hypertension. Even worse, most of them don't know they have it. This is a concerning public health issue because if left unchecked, your risk for stroke and heart attack increases.

But that's not the only matter American adults need to worry about. As you'll learn later, your nervous system largely relies on your cardiovascular system for oxygen and other nutrients to function properly. Without adequate sustenance due to faulty blood vessels, your cognitive function becomes affected. This is one of the most striking findings that was discovered in a recent study published in the journal Neuron.[1]

How Does High Blood Pressure Affect the Brain, Exactly?

Researchers investigated how high blood pressure affects the brain at the level of individual cells. Using an animal model, they observed what happens inside the brain during the very earliest stages of hypertension, long before symptoms show up on a memory test. They mapped out gene activity in thousands of single brain cells to understand which cells struggle first and how it snowballs into cognitive decline.[2,3]

- **A prediction of human physiology —** The researchers used an animal model to simulate the real-world trajectory of adults who live with elevated blood pressure for years. The test mice were healthy before the experiment, which allowed the researchers to watch hypertension disrupt normal brain function from its starting point.

  After establishing a baseline, they administered angiotensin, which is a hormone that raises blood pressure similar to humans. The experiment was completed after 42 days.[4]

- **There is less cellular energy for the body —** In a preprint of the featured study, researchers showed that mitochondrial genes tied to energy production were downregulated, meaning the neurons began producing less adenosine triphosphate (ATP), which is your body's energy currency.[5]

- **Overall increase of risk —** Collectively, the findings explain why people diagnosed with hypertension have a 1.2 to 1.5 higher risk for developing cognitive disorders.[6] In addition, cognitive domains such as executive function, abstract reasoning, memory, and processing speed are affected.[7]

Can Hypertension Damage Your Brain Before Your Blood Pressure Even Rises?

The experiment ran for only over a month; while this timeframe is a small footprint in a human's lifespan, it's already plenty for mice. Thus, the team used this analogy to warn the public about unaddressed hypertension:

- **Changes appeared in just three days —** The researchers immediately observed changes in three categories — endothelial cells, interneurons, and oligodendrocytes.

  Endothelial cells, which are found in blood vessel linings, immediately showed signs of accelerated aging and reduced energy metabolism. Meanwhile, interneurons, which help maintain homeostasis between excitatory nerve signal, are also damaged and show "early patterns seen in Alzheimer's disease."[8]

- **Nerve insulation was damaged —** Oligodendrocytes are the cells responsible for producing myelin, which is coating around nerves. When myelin production stalls, neurons slow down and "eventually lose the ability to communicate with each other, which is critical for cognitive function."[9] And as established earlier, hypertension damaged this important biological process.

- **The blood-brain barrier was compromised —** Once endothelial cells became dysfunctional, blood-brain barrier permeability increased. This shift opens the door for inflammatory molecules, toxic proteins, and oxidative byproducts that should never enter the brain.

  When foreign substances slip in, the immune cells in your brain activate in defense mode, creating a chronic inflammatory environment that accelerates aging in brain tissue. The study's findings show that blood-brain barrier disruption is one of the earliest events under sustained high blood pressure.

- **Chronic hypertension causes further damage —** While the three-day changes were striking on their own, the end of the study revealed how those micro-injuries evolve into clear dysfunction. By day 42, the researchers found widespread neurovascular

impairment and clear signs of cognitive problems.

What Brain Changes Show Up on MRI in People with Long-Term High Blood Pressure?

Now, it's time to visit the other end of the spectrum — brain health when you already have chronic hypertension. Within this context, damage occurs over years rather than days, and magnetic resonance imaging (MRI) shows a very visible story.

- **The implications of hypertension on your cognitive function —** A study published in The Lancet Neurology shows that midlife hypertension and long-standing high blood pressure are linked with more white matter hyperintensities, more microbleeds, and smaller total brain and hippocampal volumes in later life.[10]

  For context, white matter hyperintensities refer to damage in your brain's white matter caused by dysfunction in the cerebral blood vessels. Basically, higher volumes of this affect your information processing speed, which ultimately leads to dementia.[11]

- **What your brain looks like under an MRI machine —** On an MRI scan, white matter hyperintensities look like bright spots scattered through the brain's wiring. They reflect small areas where blood flow and insulation have suffered. Studies connect a higher burden of these spots with slower walking speed, weaker executive function, and a higher risk of stroke and dementia.[12]

- **Systolic versus diastolic readings —** Blood pressure is interpreted with two numbers — systolic (top) and diastolic (bottom). The first one refers to pressure when the heart pumps, while the second refers to pressure when the heart is at rest.

  Both numbers are important, especially in the context of brain health. Going back to The Lancet Neurology study, researchers noted that higher diastolic pressure in early and mid-adulthood is linked to more white matter hyperintensities and smaller

brain volumes later on. Moreover, very high systolic pressure in older adults often tracks more closely with stroke risk and further white matter damage.

- **The threshold —** It's important to manage your blood pressure to preserve your brain health. The findings indicate that an increase of over 140 mmHg for systolic and below 90 mmHg for diastolic is linked to a higher volume of white matter hyperintensities.[13]

When in Life Does Blood Pressure Start to Matter for Dementia Risk?

Aging is accepted to be a major risk factor behind high blood pressure, and there's plenty of research supporting this belief:

- **Cognitive decline in those with hypertension —** In a report from Johns Hopkins Medicine, researchers noted that seniors (70s to 90s) with high blood pressure added 2.7 years to their brain's aging compared to those who had normal levels. While this may seem like a small difference, it's enough to reach a diagnosis of mild cognitive impairment, or even dementia.[14]

- **It's time to start monitoring earlier —** Based on the findings of the Johns Hopkins Medicine study, The Lancet study provides practical suggestions to keep your brain health in check. Specifically, the researchers recommend measuring blood pressure regularly so you can adjust your lifestyle as needed.

What Symptoms Might Hint That High Blood Pressure Is Affecting Your Brain?

At first, it's hard to detect the signs that hypertension is affecting your brain health. You can live for years with rising blood pressure without feeling white matter lesions developing in your brain. That's why it's important to familiarize yourself with the telltale indicators:

- **Watch out for subtle changes —** You might notice yourself becoming more forgetful, as well as having trouble with multitasking. When this happens, you might feel more depressed, especially once you've been diagnosed with hypertension.[15]

- **Red-flag indicators —** When your hypertension is left untreated, it affects more than just your brain function. You'll also notice facial drooping, vision loss, severe headaches, and loss of coordination. If you develop any of these symptoms, contact emergency services immediately.[16]

Does Treating High Blood Pressure Reverse Brain Damage or Mostly Slow It Down?

Even if the damage has been done, it's no reason to lose hope. Through proper treatment, you can ward off cognitive impairment:

- **Mice show reversal of damage —** In the Neuron study, mice administered with the hypertension drug losartan, which inhibited angiotensin, reversed damage.[17] While this drug did show promise, I don't encourage this method because I believe that a natural, holistic approach is better for managing blood pressure.

- **The impact of natural strategies —** In a report from The Guardian, researchers noted that lifestyle adjustments made an improvement in blood pressure. Methods employed include alcohol reduction, weight loss programs, and regular monitoring.[18]

What Can You Do Now to Protect Your Brain from High Blood Pressure?

Now, it's time to get into the things that really make an impact. When it comes to managing your blood pressure, here are my recommendations:

- **Track your blood pressure regularly —** Most adults wait until they reach their 50s or 60s to monitor their blood pressure. However, as the published research shows, this is a mistake. It's better to do it in your 30s and 40s so you can adjust any factors that contribute to high blood pressure readings.

- **Fix your diet —** I believe that excess linoleic acid (LA) intake is the main reason why chronic disease rates are soaring nowadays. As mentioned in a previous article, it contributes to high blood pressure by hardening your arteries. Thus, it makes sense to avoid it as much as possible.

  Avoid all products that contain soybean, corn, sunflower, safflower, cottonseed, grapeseed, canola, rice bran, and peanut oil. Aside from being used for cooking food in restaurants, they lurk in packaged snacks and salad dressings. Then, replace them with grass fed butter, ghee, beef tallow, and coconut oil.

  Nuts and seeds are often seen as nutritious food sources. However, the issue is that snacking on them eventually ramps up your LA intake. Even worse, macadamia nuts and olive oil, while being lower in LA, oxidize easily under heat or light because they're high in monounsaturated fats. When consumed, oxidation affects your ability to produce cellular energy.

  I recommend cutting back your intake to less than 2 grams a day from all sources. The challenge here is familiarizing yourself where LA comes from, as it also found in grain fed meat, which many people consume. Thus, make sure your meat comes from grass fed, biodynamic sources to lower LA intake as much as possible.

  To help you monitor your diet, sign up for the wait list for the Mercola Health Coach app. It contains the Seed Oil Sleuth, which is a handy feature that helps you calculate your daily LA consumption to a tenth of a gram. For additional tips, read "Top Foods to Help Lower Blood Pressure."

- **Move your body —** Another important aspect that many adults tend to ignore is exercise. Regular physical activity improves vessel flexibility, lowers resting blood pressure, and helps maintain brain volume. Even brisk walking most days of the

week can make a difference. To get you started on walking for longevity, read "Walking Faster Helps Prevent and Reverse Age-Related Frailty."

- **Get proper rest —** Sleep is another cornerstone of optimal health, as it allows your body to repair and regenerate itself. If you're not getting enough sleep, you're interrupting these important processes. As noted in a 2022 study, "sleep deprivation is acutely associated with blood pressure elevation."[19] To boost your sleep quality, read "Sleep — Why You Need It and 50 Ways to Improve It."

Frequently Asked Questions (FAQs) About Hypertension and Brain Health

Q: How soon can high blood pressure start damaging your brain?

A: An animal study showed that brain changes can begin as early as three days after blood pressure rises. During this time, cells lining blood vessels start aging faster, neurons lose energy, and myelin-producing cells begin to falter. The blood-brain barrier also becomes leaky, allowing harmful substances into the brain.

By 42 days, these early disruptions progress into significant neurovascular damage and cognitive decline, suggesting hypertension begins harming the brain long before symptoms appear.

Q: What are the early warning signs that high blood pressure is affecting your brain?

A: Early symptoms tend to be subtle, such as forgetfulness, difficulty multitasking, and lowered mood. As hypertension worsens or remains untreated, more serious neurological problems may appear, including facial drooping, vision changes, severe headaches, or coordination issues. These advanced symptoms indicate urgent medical attention is needed.

Q: Does controlling high blood pressure reverse brain damage or just prevent it from getting worse?

A: Research shows that some damage may be reversible — mice treated with losartan regained normal brain function. In people, lifestyle changes such as reducing alcohol, losing weight, and consistent monitoring help improve blood pressure and slow further injury. While not all harm may be undone, effective treatment clearly prevents progression and offers meaningful protection.

Q: At what age does high blood pressure start raising your risk for dementia?

A: Dementia risk increases earlier than expected. Studies recommend monitoring blood pressure by around age 40, since midlife hypertension is linked to later brain shrinkage and white matter damage. In older adults, high blood pressure adds about 2.7 years of extra brain aging, enough to push some toward cognitive impairment or dementia.

Q: How does high blood pressure change brain scans like MRI?

A: Long-term hypertension leads to more white matter hyperintensities — bright spots indicating damaged wiring — along with microbleeds and smaller brain and hippocampal volumes. These changes correlate with slower thinking, stroke risk, and dementia. Higher diastolic pressure earlier in life and very high systolic pressure in older age both predict more severe MRI changes. Readings above 140/90 are associated with a higher burden of white matter injury.

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