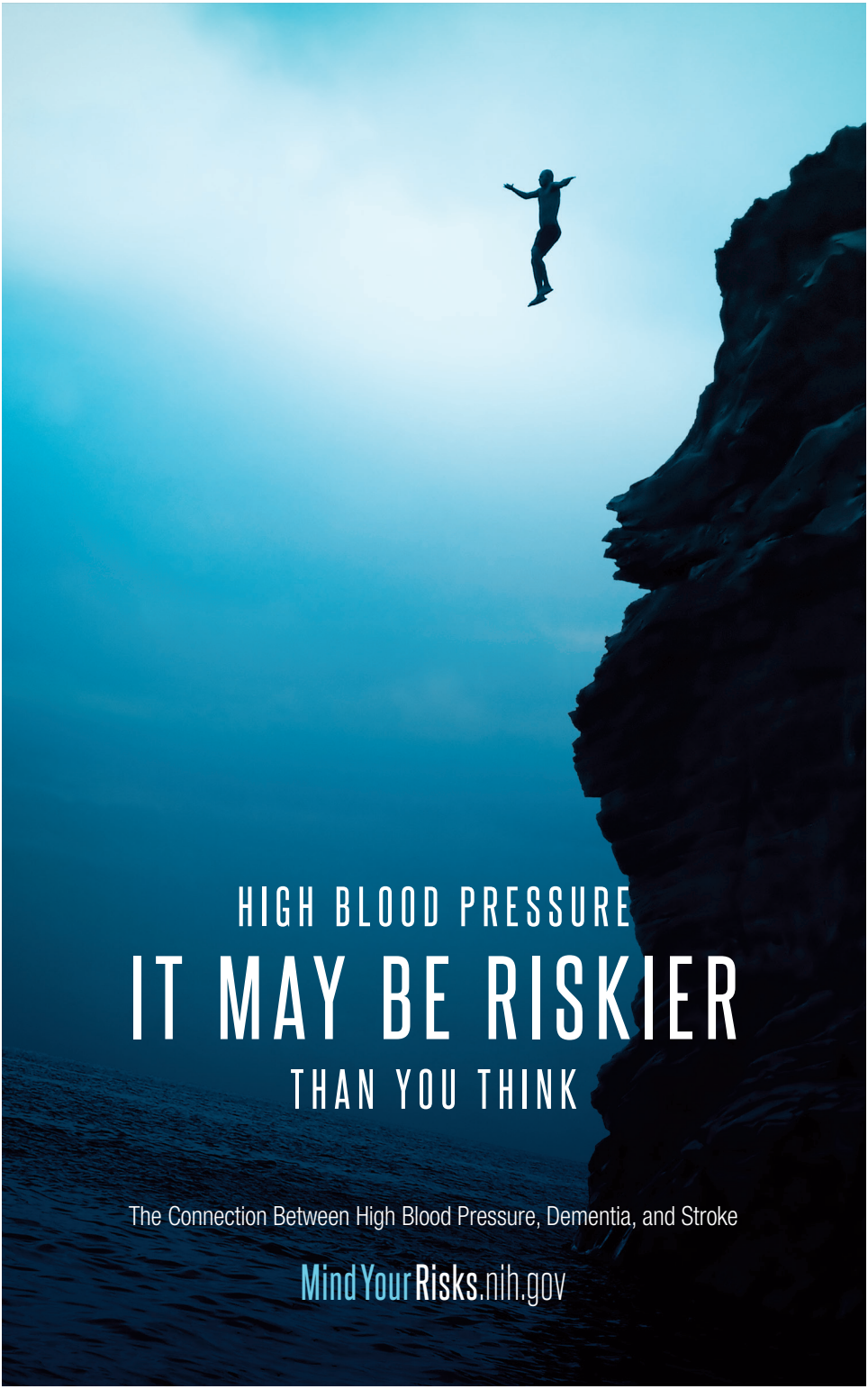

HIGH BLOOD PRESSURE
IT MAY BE RISKIER
THAN YOU THINK
The Connection Between High Blood Pressure, Dementia, and Stroke
MindYourRisks.nih.gov

Mind Your Risks®

We face many risks in our daily lives but we take steps to lower some of them. We put on a seatbelt when we get into a car. We apply sunscreen when we are enjoying the day outside.

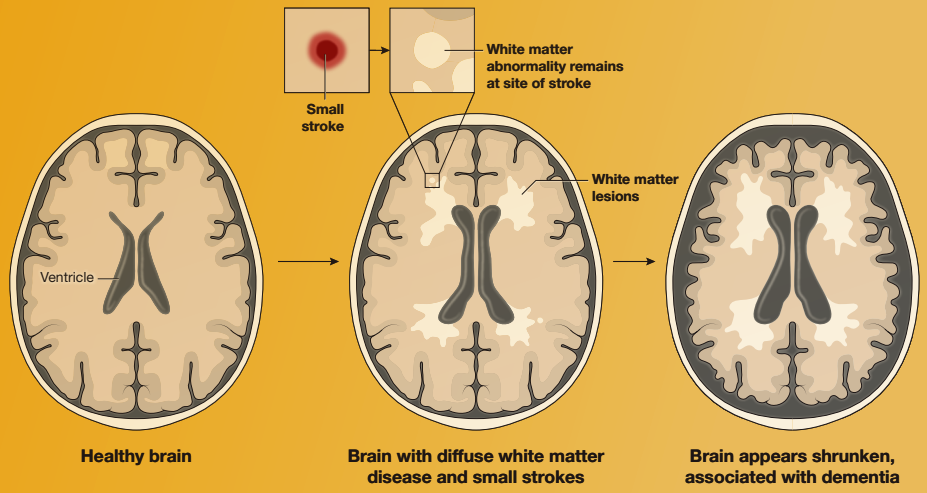
Many people with high blood pressure know about the health risks they face, including stroke, heart attack, and kidney problems. So they take steps to follow a healthier lifestyle. But, let's face it, high blood pressure can be hard to control on a daily basis and only 50 percent of people with hypertension have their blood pressure controlled.

Though it's difficult to achieve, blood pressure control is really important. Now there is another reason to "Mind Your Risks®."

Scientists around the world are learning about the aging process as well as the abnormal cellular changes in the brain that can lead to gradual loss of thinking abilities as we age. This research may someday lead to new treatments for what is called "cognitive impairment" as well as dementia in its most severe forms. In the meantime, we have learned a great deal about risk factors that are associated with cognitive impairment and dementia.

New research tells us that having high blood pressure when you're middle aged may raise your risk for cognitive impairment and dementia, as well as stroke, later in life. Conversely, people with lower blood pressure appear to have a lower risk of cognitive impairment and dementia.

How High Blood Pressure May Be Linked to Dementia



The heart and brain are the two hardest working organs in your body. They are so closely linked that the conditions that put one at risk for poor health may affect the other. Here are the important ways that the heart and the brain are connected:

The heart pumps blood to all the parts of your body, including the brain. The force of the heart's pumping and the resistance of the small blood vessels determine the blood pressure.

When the blood enters the brain, a complicated network of blood vessels distributes oxygen and nutrients to billions of cells and removes byproducts of metabolism from the brain. Brain health is linked to the health of the millions of blood vessels that supply the brain.

Over years, the wear and tear of high blood pressure causes the brain's blood vessels to become scarred, narrowed, and diseased. This can affect the bloodstream's ability to provide the nerve cells with the oxygen and nutrients they need or to remove toxic byproducts.

This leads to chronic brain injury in the form of damage to the nerve fibers and their insulation that affects communications across the central nervous system (diffuse white matter disease). It also leads to multiple, small, usually "silent" strokes. Though there are no immediate symptoms, these brain changes have been linked to development of cognitive decline and dementia.

With aging, damage to the brain's blood vessels, silent strokes, and diffuse white matter disease add to the changes that occur with Alzheimer's disease and result in dementia.

In some cases, extensive stroke damage itself causes vascular dementia, making this one of the most common forms of dementia after Alzheimer's disease.

High blood pressure is the most important preventable risk factor for stroke. In persons with vascular risk factors, aspirin and other drugs may be effective at decreasing the risk of stroke and heart attack.

Treating high blood pressure and keeping it under control are good for the brain.

Turning the Tide?

Over the past five decades, stroke rates in the US have decreased by 70 percent as blood pressure control has become the standard of care. A number of recent studies have reported decreased dementia incidence rates in the US and other developed countries. Although the cause of this decline is not entirely clear, many believe it is related to decreasing stroke rates. Because only 50 percent of people with hypertension have their blood pressure controlled, there is work to be done.

Steps to Mind Your Risks®

Take these steps now to "Mind Your Risks" and reduce your chance of stroke, cognitive impairment, dementia, and heart disease later in life.

1. **Talk to your healthcare provider** about your risk for stroke, dementia, and heart disease.
2. **Work with your provider to develop a plan** to control your blood pressure and other risk factors.
3. **Stick to the plan.** This is the hard part, but keeping your heart and brain healthy will lead to better health in old age.

A healthy heart and a healthy brain are both crucial to a healthy old age.

Goals to Reduce Your Risks

From staying active to taking medication prescribed by your doctor, these seven simple and effective lifestyle changes can help keep your heart and brain healthy.

- **Take blood pressure medicines as instructed by your healthcare provider**
- **Quit smoking**
- **Lower your cholesterol levels**
- **Eat healthy and keep active**
- **Exercise regularly and manage your weight**
- **Manage your diabetes**
- **Find out whether daily low-dose aspirin is right for you**

Words to Know

Dementia causes people to experience changes in multiple mental abilities, such as reasoning and remembering, that might make it difficult to do things that were once routine daily activities. People also may experience personality changes and behavioral problems, such as agitation, delusions, and anxiety. While severe memory loss is a common symptom of dementia, memory loss by itself does not mean that a person has dementia.

A **stroke** occurs when blood circulation to the brain fails, either due to a clot that blocks blood flow or a blood vessel that ruptures and bleeds into surrounding brain tissue. As a result, brain cells can die and the consequences can range from mild to severe, depending on the size and location of the stroke.

Silent strokes (or micro infarcts) show up as multiple areas of ischemic tissue damage (which occurs when an artery to the brain is blocked) on MRI scans or in brains examined after death. In contrast to strokes that cause immediate and obvious consequences, silent strokes go unnoticed because they are so small, or because they occur in areas that are not directly responsible for movement, speech, vision, or other critical functions.

Diffuse white matter disease is a change in brain structure that can be seen on MRI scans in the majority of older people, affecting as many as 80 percent of those over age 80. Research has shown a connection between white matter lesions and blood pressure, with higher blood pressure levels over time being linked to more areas of white matter damage. Some studies also suggest a link between severe white matter lesions and lower performance on tests of cognitive function.

For More Information

About the connection between high blood pressure, stroke, and dementia, visit the *Mind Your Risks®* website at **www.mindyourrisks.nih.gov**.

About stroke, visit *Know Stroke* at **www.stroke.nih.gov**.

About high blood pressure, visit *Million Hearts®* at **www.millionhearts.hhs.gov**.

About Alzheimer's disease and other dementias, visit the National Institute on Aging at **www.nia.nih.gov/alzheimers**.

About heart disease, visit the National Heart, Lung, and Blood Institute at **www.nhlbi.nih.gov**.

Mind Your Risks® is a public health campaign that educates people with high blood pressure about the importance of controlling blood pressure during middle age (between the ages of 45 and 65) to help reduce the risk for developing stroke and dementia later in life.

Mind Your Risks® is a campaign from the National Institute of Neurological Disorders and Stroke, one of the institutes at the National Institutes of Health (NIH).

Learn more at **www.mindyourrisks.nih.gov**.

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