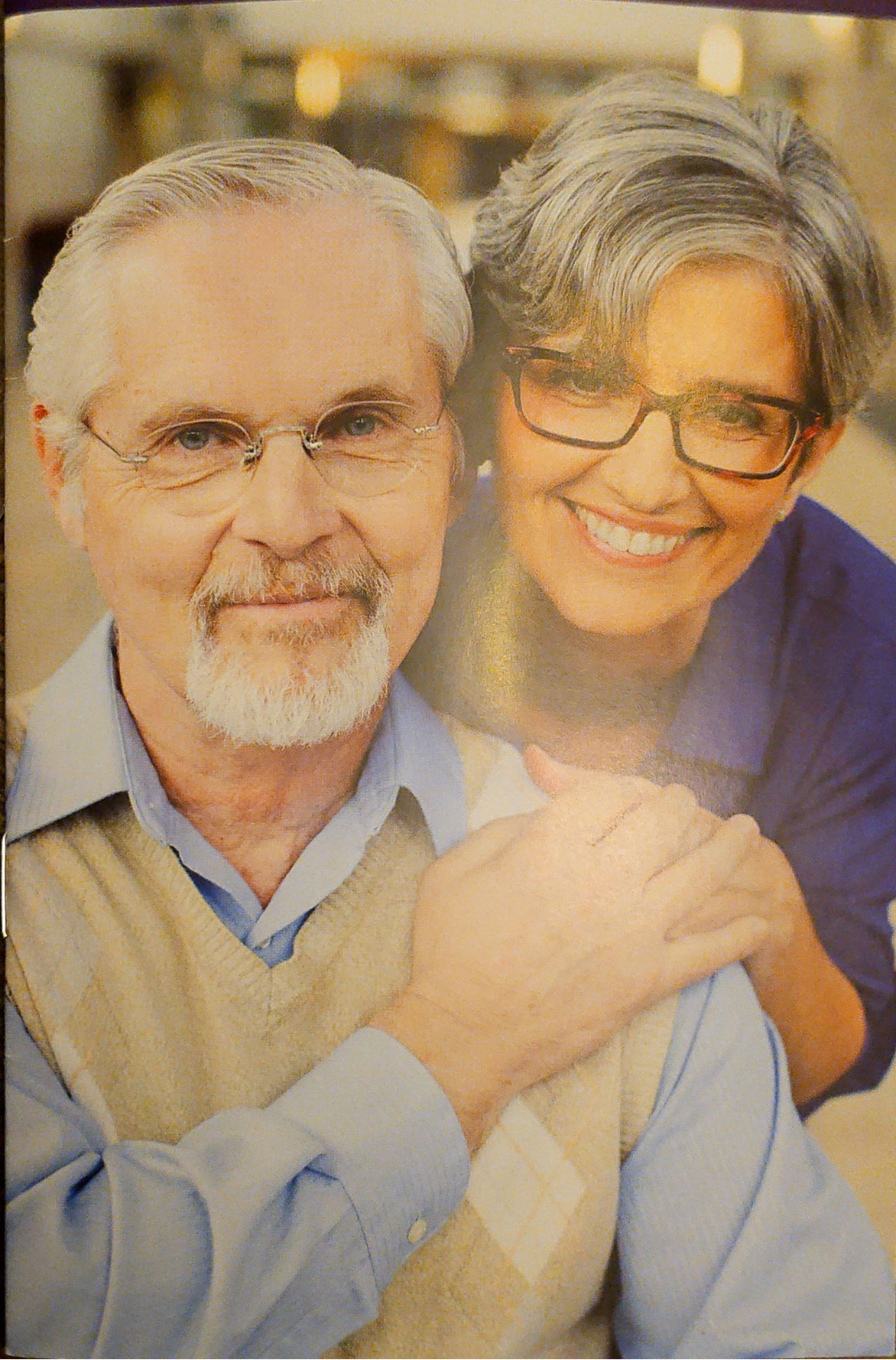
ALZHEIMER'S ASSOCIATION®

UNDERSTANDING ALZHEIMER'S AND DEMENTIA

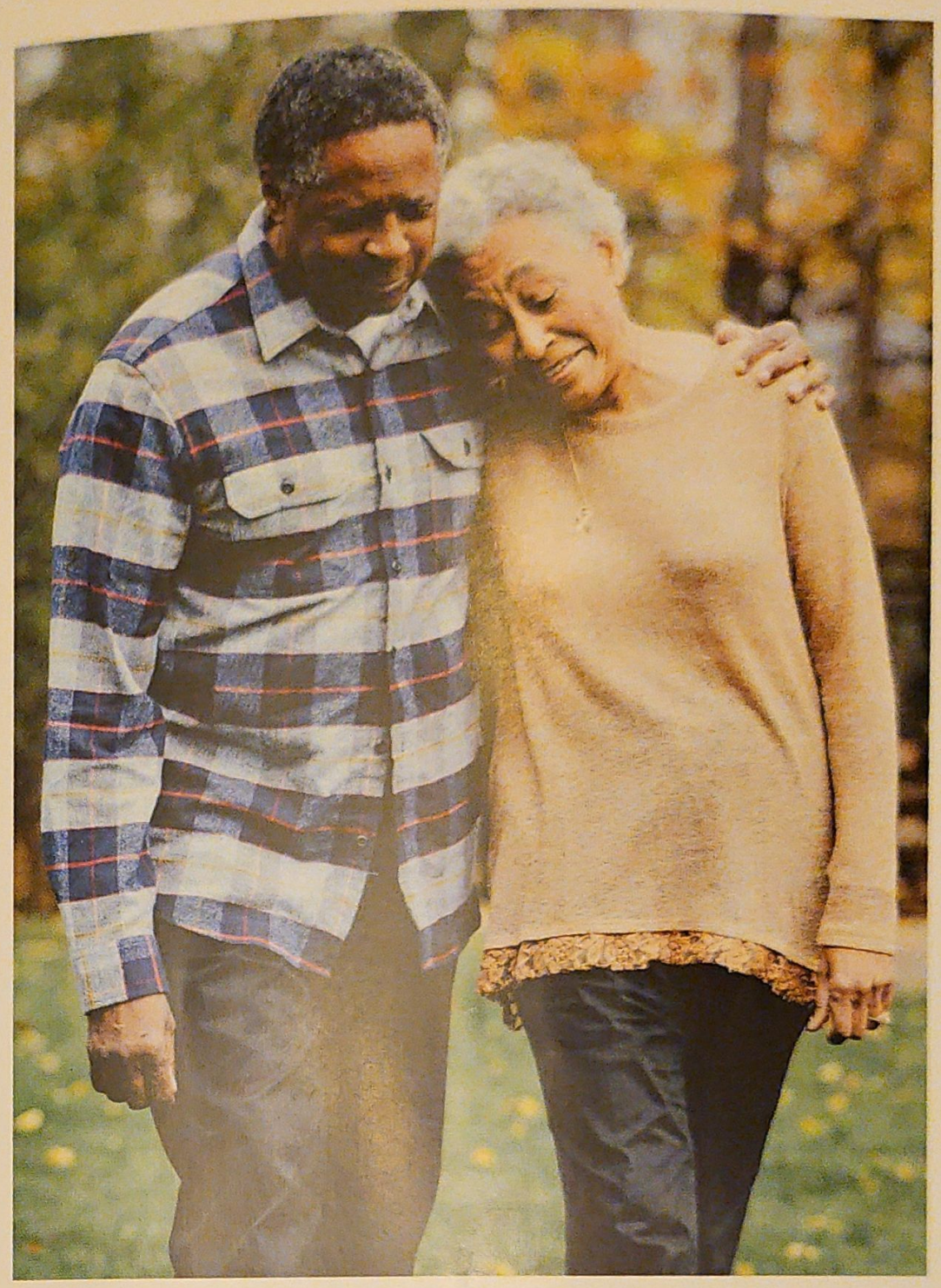


THE IMPACT OF ALZHEIMER'S AND DEMENTIA

Currently, over 55 million people worldwide are living with Alzheimer's or another dementia, including nearly 7 million Americans. Without changes in prevention or treatment, it is estimated there will be nearly 140 million people living with Alzheimer's disease worldwide by 2050, including nearly 13 million Americans.

The disease also affects the more than 11 million Americans who provide unpaid care for people living with Alzheimer's or another dementia.

The Alzheimer's Association® is available across the country and online to help people understand Alzheimer's and dementia, and receive information and support they can trust.



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1. ALZHEIMER'S AND DEMENTIA

The terms "dementia" and "Alzheimer's" are often used as though they mean the same thing. They are related, but there are important differences between the two.

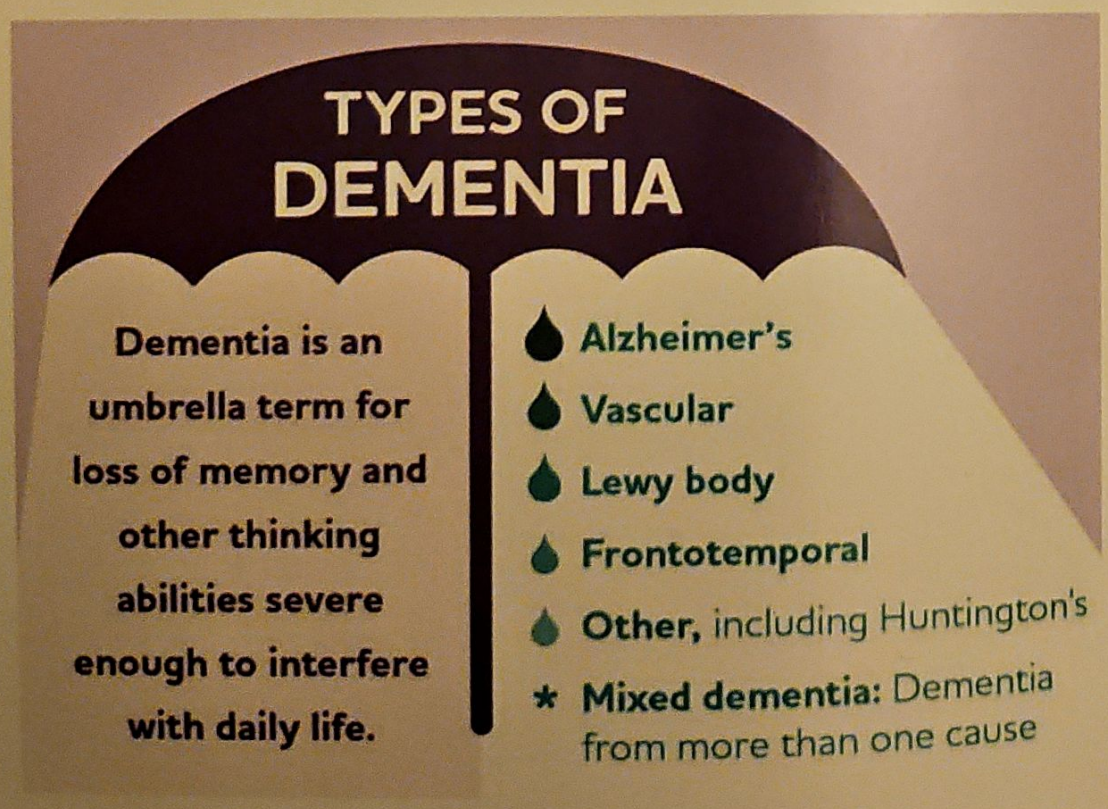
Dementia

Dementia is a broad ("umbrella") term for an individual's changes in memory, thinking or reasoning. There are many possible causes of dementia, including Alzheimer's.

Alzheimer's

Alzheimer's disease is the most common cause of dementia. It is not a normal part of aging — it's a progressive brain disease, meaning it gets worse over time.

Two abnormal brain structures called plaques and tangles are the main features of Alzheimer's disease. Scientists believe they damage and kill nerve cells. Plaques are pieces of a protein fragment called beta-amyloid that build up in the spaces between nerve cells. Tangles are twisted fibers of another protein called tau that build up inside cells.



Other common dementias

- **Vascular dementia** is a decline in thinking skills that happens when blood flow to the brain is blocked or reduced so that brain cells can't get important oxygen and nutrients. Sometimes these changes occur suddenly, such as during a stroke that blocks major brain blood vessels. Vascular dementia is the second most common cause of dementia after Alzheimer's disease.
- **Lewy body dementia (LBD)** is a type of progressive dementia related to buildup of a protein called alpha-synuclein that damages brain cells. Early symptoms include hallucinations and sleep problems.
- **Frontotemporal dementia (FTD)** is a group of disorders. Progressive cell degeneration (or breakdown) causes FTD in two places. One is in the brain's frontal lobes (the areas behind the forehead). The other is in the brain's temporal lobes (the regions behind the ears).

LEARN MORE

Visit **alz.org/dementia** to learn about other types of dementia.

2. ALZHEIMER'S IN THE BRAIN

More than 100 years ago, Dr. Alois Alzheimer described specific changes in the brain. Scientists now call them beta-amyloid plaques and tau tangles. Today we know that Alzheimer's is a progressive brain disease. It is marked by these key changes and impacts memory, thinking and behavior.

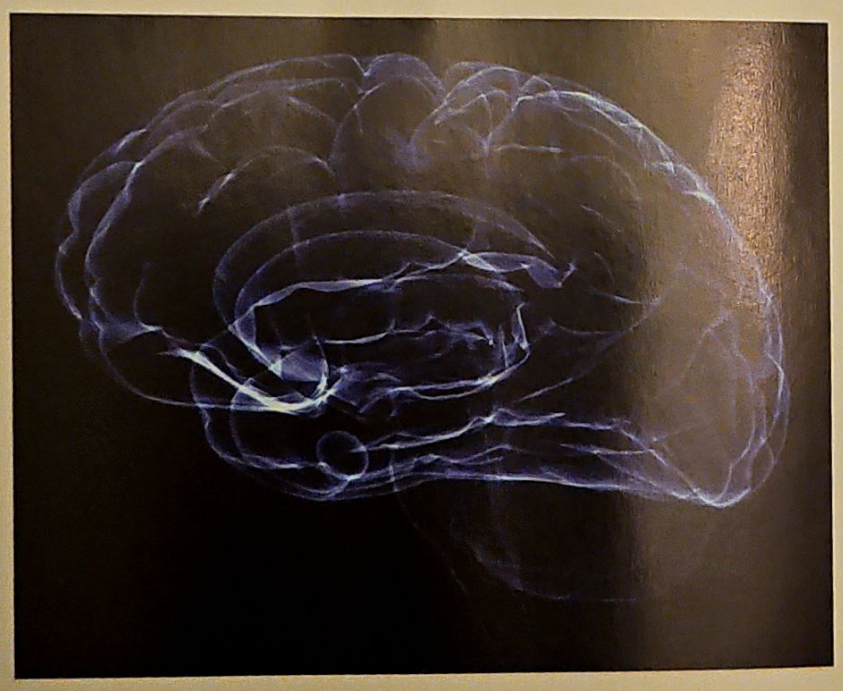
What goes wrong in the brain

The brain has three main parts: the cerebrum, cerebellum and brain stem. Each has a job to do to make the body work properly.

The cerebrum fills up most of the skull. It's the part of the brain most involved in remembering, problem-solving and thinking. There are about 100 billion nerve cells called neurons throughout the brain that send messages in order to make memories, feelings and thoughts.

Alzheimer's disease causes nerve cells to die. This causes the brain to lose tissue (also called shrinkage) and the loss of function and communication between cells. These changes can cause the symptoms of Alzheimer's disease. These include memory loss; problems with thinking and planning; behavioral issues; and, in the last stage, a further decline in functioning, which can even include trouble swallowing.

TAKE A CLOSER LOOK



Visit **alz.org/brain** to explore *Inside the Brain: A Tour of How the Mind Works*.

3. RISK FACTORS

Scientists know that nerve cell failure is a part of Alzheimer's disease, but they don't yet know why this happens. However, they have identified certain risk factors that increase the likelihood of developing Alzheimer's.

Age

The greatest known risk factor for Alzheimer's is age. After age 65, a person's risk of developing the disease doubles every five years. Thirty-three percent of people age 85 or older have Alzheimer's.

Family history

Researchers have learned that people who have a parent or sibling with Alzheimer's are more likely to develop it than those who do not. The risk is due to shared genetic, environmental and lifestyle factors, and increases if more than one family member has the disease.

Genetics

Two types of genes may influence whether a person develops a disease: risk genes and deterministic genes. Risk genes increase the chance of developing a disease but do not guarantee it will happen. Deterministic genes cause a disease. This means anyone who inherits a deterministic gene will develop a disorder.

Rare deterministic genes cause Alzheimer's in a few hundred extended families worldwide. Scientists estimate these genes cause less than 1% of cases. Individuals with these genes usually develop symptoms in their 40s or 50s.

Ethnicity, race and sex

Research shows that Hispanic and Black older adults are disproportionately more likely than White older adults to have Alzheimer's or another dementia.

No one knows the exact reason for these differences, but researchers believe the connection may be due to higher rates of cardiovascular disease in these groups — and likely other contributing factors, such as health and socioeconomic disparities. Scientists need to learn more about other potential causes behind this increased risk. To do so, it is critically important to increase the participation of individuals from underrepresented communities in clinical research. See pages 13-14 to learn more.

Also, women live longer than men, making them more likely to develop Alzheimer's. However, longevity doesn't completely explain this difference. Researchers are exploring how biological, social and cultural differences in women may impact disease risk.

Lowering the risk of cognitive decline

Age, family history and genetics are all risk factors we can't change. However, research is starting to show there are lifestyle habits that may help keep your brain healthy and lower your risk of cognitive decline.

Science tells us there is a strong connection between brain health and heart health. The risk of developing Alzheimer's or vascular dementia appears to be increased by many conditions that damage the heart and blood vessels. These include high blood pressure, diabetes, stroke and obesity. Therefore, eating a balanced, heart-healthy diet and getting regular exercise may benefit both your heart and your brain.

Other healthy lifestyle habits that may also be good for your brain include avoiding tobacco and excess alcohol, regularly getting a good night's sleep, and staying socially and mentally active.

Science also shows a strong connection between serious head injury and future risk of cognitive decline. For this reason, it's important to protect your head by buckling your seat belt and put safety measures in place to help prevent falls.

4. STAGES OF ALZHEIMER'S DISEASE

Alzheimer's disease progresses in stages with a range of symptoms that increase in severity over time.

Because the disease affects people in different ways, the rate of progression will vary. On average, a person with Alzheimer's may live four to eight years after diagnosis, but some people live as long as 20 years.

The following descriptions provide a general idea of changes at each stage. Stages of Alzheimer's may overlap, which can make it difficult to know which stage a person is in.

Asymptomatic

On the earliest end of the continuum are people who are asymptomatic (i.e., without symptoms). This means that they may have the biological changes of the disease in their brain but do not show any cognitive symptoms. Researchers are working hard to develop tools that could diagnose Alzheimer's disease in people before they have noticeable symptoms.

Mild cognitive impairment (MCI) due to Alzheimer's disease

Mild cognitive impairment (MCI) is an early stage of memory loss or other loss of cognitive ability in individuals who can still independently perform most activities of daily living. MCI can develop for multiple reasons, and some individuals living with MCI may go on to develop dementia while others will not. MCI can be an early stage of Alzheimer's disease if hallmark changes in the brain, such as beta-amyloid buildup, are present. Symptoms of MCI can include:

- Forgetting important information such as appointments, conversations or recent events.
- Difficulty with making good decisions, judging the time or recalling a sequence of steps needed to complete a complex task.

Mild dementia due to Alzheimer's disease

Those with MCI due to Alzheimer's typically progress to the next stage of the disease called mild dementia due to Alzheimer's disease (sometimes referred to as early stage, although it is important to note that MCI and mild dementia due to Alzheimer's disease are both early stages).

A person in this stage will typically start to experience symptoms that interfere with some daily activities, such as:

- Problems coming up with the right word or name for something.
- Trouble remembering people's names after being introduced.
- Difficulty with familiar tasks.
- Forgetting something that was just read.
- Getting lost in familiar places.
- Increased trouble with planning or organizing.

Moderate dementia due to Alzheimer's disease

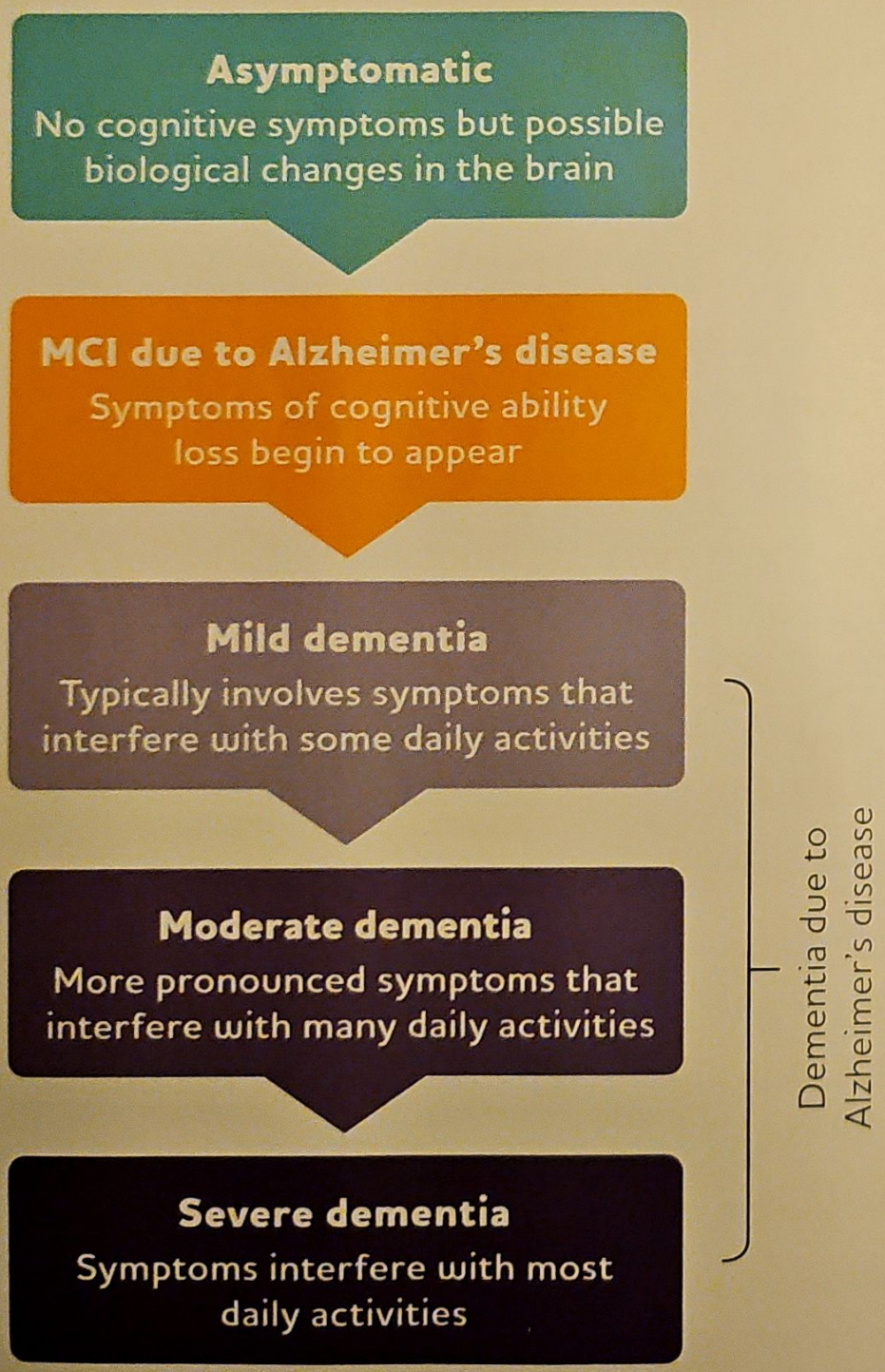
Moderate dementia (sometimes referred to as the middle stage) is typically the longest stage and can last for many years. Significant personal details may still be recalled, but as biological changes of the disease progress, symptoms such as gaps in memory and thinking are more noticeable, and assistance with daily tasks is required. Challenges can include:

- Forgetting events or personal history.
- Feeling frustrated, angry or withdrawn, especially in socially or mentally challenging situations.
- Confusion about where they are or the day of the week.
- Trouble controlling bladder and bowels.
- Needing help to choose the right clothes for the weather or occasion.
- Changes in sleep patterns, such as sleeping during the day and restlessness at night.
- A higher risk of wandering and becoming lost.
- Personality and behavioral changes, such as becoming suspicious or delusional, believing that others are lying, or, repeating a behavior over and over.

Severe dementia due to Alzheimer's disease

In the severe dementia stage (sometimes referred to as the late stage), symptoms will interfere with most daily activities as biological brain changes continue to progress. The person will need a lot of help with personal care. In this stage, individuals may:

- Lose awareness of recent experiences as well as of their surroundings.
- Go through changes in physical abilities. This may affect their ability to walk, sit and, eventually, swallow.
- Have more trouble communicating.
- Be at higher risk of infections, especially pneumonia.



Biological brain changes progress throughout each stage of the disease.

5. FDA-APPROVED TREATMENTS

Progress in Alzheimer's and dementia research is creating promising new treatments for people living with the disease. It is important to talk with a doctor to learn as much as possible about which drugs are available and whether they may be appropriate.

The U.S. Food and Drug Administration (FDA) has approved medications for Alzheimer's. These fall into two categories:

- Drugs that temporarily ease some symptoms of Alzheimer's disease.
- Drugs that change disease progression in people living with Alzheimer's.

Talk with your doctor

When considering any treatment, it is important to have a conversation with a health care professional to determine whether it is appropriate, and weigh potential benefits and risks. A doctor who is experienced in using these medications should monitor people who are taking them and provide information that can help people make informed decisions about their usage and care.

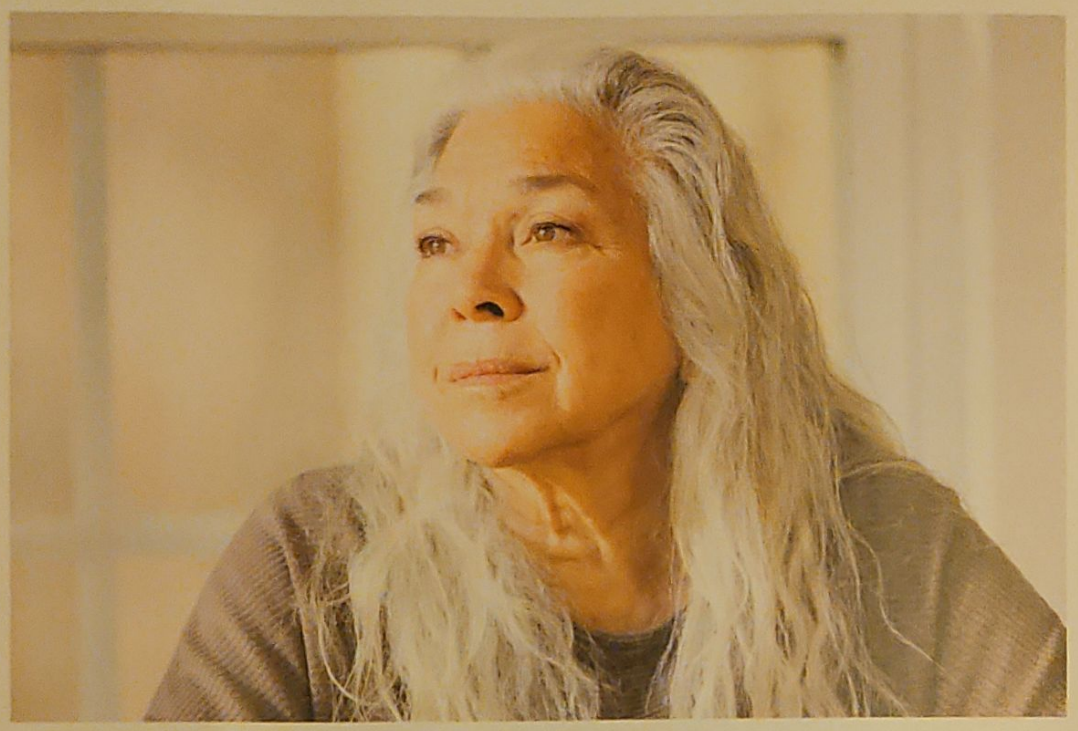
To prevent drug interactions and unwanted side effects, make sure the doctor, pharmacist and care team are aware of all current medications, including over-the-counter and alternative remedies. Visit **alz.org/doctor** for guidance on questions to ask.

LEARN MORE

For more information on FDA-approved treatments for Alzheimer's disease, visit **alz.org/medications**.

Importance of early diagnosis

It is important to seek a diagnosis as early as possible. The earlier a diagnosis is made, the more treatment options may be available. Some medications are only available to people in the early stages of the disease, including those with MCI and mild dementia due to Alzheimer's disease.



6. ADVANCING ALZHEIMER'S RESEARCH

Research shows that Alzheimer's starts many years before people living with the disease notice symptoms. With this knowledge, researchers are working to identify people who are most at risk before symptoms appear, and driving the effort to develop treatments to slow, stop or prevent the disease.

As the world's largest nonprofit funder of dementia research, the Alzheimer's Association has played a vital role in every significant development in Alzheimer's science, and paves the way for future progress.

Clinical studies drive progress

Taking part in a clinical study is one way that anyone can help fight Alzheimer's disease. Without volunteers for research, scientists cannot find ways to prevent, treat and, ultimately, cure the disease. Researchers are seeking people of all racial and ethnic backgrounds to participate in clinical trials to ensure diagnostics and treatments are safe and effective for everyone.

Some clinical studies involve drugs and physical tests, while others involve observation and questionnaires. Every clinical study gives us important knowledge, whether or not the study was successful.

For people living with dementia, there are other benefits to taking part in clinical studies, including access to expert medical care and promising treatments.

Visit **alz.org/trialmatch** to learn more about **Alzheimer's Association TrialMatch®**, a free service that provides customized lists of clinical studies based on user-provided information. The easy-to-use platform allows people living with dementia, caregivers and healthy volunteers to find studies and actively fight against the disease. Search for studies, sign up for study updates or connect with researcher teams with the click of a button.

alz.org

Access reliable information and resources, such as:

» ALZNavigator™ – Assess your needs and create a custom action plan

» Community Resource Finder – Find resources, including your local Association chapter.

» ALZConnected® – Connect with other caregivers or people with dementia.

» Online Caregiver Resources – Get information for all stages of the disease.

alz.org/education

Free online programs, including:

» *Understanding Alzheimer's and Dementia*

800.272.3900

24/7 Helpline – Available all day, every day.

ALZHEIMER'S ASSOCIATION®

The Alzheimer's Association is a worldwide voluntary health organization dedicated to Alzheimer's care, support and research. Our mission is to lead the way to end Alzheimer's and all other dementia — by accelerating global research, driving risk reduction and early detection, and maximizing quality care and support.

Our vision is a world without Alzheimer's and all other dementia®.

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