

What causes Alzheimer's? Genes, environment and lifestyle play roles

June 20 2023, by Kirstie Ganobsik



Learning that your loved one has Alzheimer's disease can be frightening

and leave you feeling lost and unsure.

To help you better understand the condition and what you can do to manage it, experts detail what causes Alzheimer's disease. In this guide, you'll learn about the genetic, environmental and [lifestyle factors](#) that scientists think may interact to contribute to the development of this memory-robbing disease.

What causes Alzheimer's?

According to the [National Institute on Aging](#) (NIA) and [Cleveland Clinic](#), Alzheimer's disease involves brain changes that include:

- The buildup of protein plaques called amyloids in brain cells
- The development of tangled fibers called tau (or [neurofibrillary tangles](#))
- The slow death of nerve cells due to these plaques and fibers

What exactly causes these proteins to increase in the brain? Here, you will learn what science has to say.

Genetic factors

You inherit genes from your parents, which code for your biological and physical traits.

The [Alzheimer's Association](#) states that less than 1% of people worldwide have genes called deterministic genes, which means that anyone with these genes will definitely develop Alzheimer's.

"For 1% of all cases, there are three genes that determine definitively whether or not you will have Alzheimer's, and all three relate to amyloid-

beta production, which in these cases is likely the cause of Alzheimer's," [Dr. Gad Marshall](#), director of clinical trials at Brigham and Women's Center for Alzheimer Research and Treatment in Boston, said in a recent [article](#).

The Alzheimer's Association notes that these three deterministic genes are:

- Amyloid precursor protein (APP)
- PS-1
- PS-2

All three of these genes cause early-onset Alzheimer's disease, which means [symptoms](#) typically start when people are in their early 40s to mid-50s.

A second group of genes is called risk genes. Although they can contribute to the development of Alzheimer's, having these genes doesn't mean you'll definitely develop the condition. For example, the risk gene with the highest known likelihood of causing Alzheimer's is called APOE-e4, and it's estimated that 40% to 65% of people with APOE-e4 develop the condition.

The NIA notes that the APOE-e4 gene increases the risk for late-onset Alzheimer's, which is when symptoms start as early as a person's mid-60s.

Environmental factors

According to an article published in [Arizona State University News](#), scientists now believe that in addition to genes, [environmental factors](#) also play a role in causing Alzheimer's disease.

"What we know is that [genes](#) load the gun; the environment pulls the trigger," said [Rolf Halden](#), director of the Center for Environmental Health Engineering at Biodesign Institute, in Arizona.

The [NIA](#) agrees that environmental toxins "probably" combine with other risk factors to cause Alzheimer's disease, and research is ongoing.

A recent study published in the [Environmental Science and Pollution Research](#) journal lists several of these environmental risk factors, including:

- Prolonged exposure to aluminum, lead, mercury and cadmium
- Certain pesticides
- Nanoparticles that contain metal
- [Particulate matter in the air](#), such as dust, smoke and dirt

So, why do these environmental chemicals, toxins and pollutants cause such damage?

According to a review published recently in the journal [Neurochemistry International](#), they may work to trigger Alzheimer's in a number of ways, such as by causing brain inflammation, beta-amyloid plaque deposits, tangles, oxidative damage (cell damage due to oxidative stress) and cell death.

Lifestyle factors

A third potential cause of Alzheimer's is actually a group of lifestyle choices and health markers. While there's no firm evidence that any one of them causes Alzheimer's, they've been shown to contribute to the progress of the disease, according to the [NIA](#) and [Harvard Health](#).

These lifestyle factors include:

- Smoking
- Drinking alcohol in excess
- Having markers that increase your risk for cardiovascular disease, such as [high blood pressure](#) and cholesterol
- A sedentary lifestyle
- An unhealthy diet
- Consistent lack of sleep
- Social isolation

Marshall said there are several strategies you can use to combat these Alzheimer's risk factors, including eating a [Mediterranean diet](#), exercising at least 2.5 hours per week and stopping smoking.

He also said that learning new skills may have some benefits, although evidence on that is limited.

"We think that cognitively stimulating activities may be helpful in preventing Alzheimer's, but the evidence for their benefit is often limited to improvement in a learned task, such as a thinking skills test," he explained.

So, which lifestyle practices work best to reduce Alzheimer's risk?

"They're all beneficial, and if they help you avoid Alzheimer's, all the better," Marshall advised.

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Citation: What causes Alzheimer's? Genes, environment and lifestyle play roles (2023, June 20) retrieved 29 April 2024 from <https://medicalxpress.com/news/2023-06-alzheimer-genes-environment-lifestyle-play.html>

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