

FLEX CEUs



Alzheimer's Disease, Prevalence, and Caregiving



Risk Factors for Alzheimer's

With the exception of cases of Alzheimer's caused by genetic abnormalities, experts believe that Alzheimer's, like other common chronic diseases, develops as a result of multiple factors rather than a single cause.

Age, Family History and the Apolipoprotein E (APOE)-e4 Gene

The greatest risk factors for late-onset Alzheimer's are older age,³⁰⁻³¹ having a family history of Alzheimer's³²⁻³⁵ and carrying the APOE-e4 gene.³⁶⁻³⁷

Age

Age is the greatest of these three risk factors, with the vast majority of people with Alzheimer's dementia being age 65 or older. As noted in the Prevalence section (see pages 17-25), the percentage of people with Alzheimer's dementia increases dramatically with age: 3 percent of people age 65-74, 17 percent of people age 75-84, and 32 percent of people age 85 or older have Alzheimer's dementia.³¹ It is important to note that Alzheimer's is not a normal part of aging, and older age alone is not sufficient to cause Alzheimer's dementia.

Family History

A family history of Alzheimer's is not necessary for an individual to develop the disease. However, individuals who have a parent, brother or sister with Alzheimer's are more likely to develop the disease than those who do not have a first-degree relative with Alzheimer's.^{32,38} Those who have more than one first-degree relative with Alzheimer's are at even higher risk.³⁵ When diseases run in families, heredity (genetics), shared environmental and lifestyle factors (for example, access to healthy foods and level of physical activity), or both, may play a role. The increased risk associated with having a family history of Alzheimer's is not entirely explained by whether the individual has inherited the APOE-e4 risk gene.

APOE-e4 Gene

The APOE gene provides the blueprint for a protein that transports cholesterol in the bloodstream. Everyone inherits one of three forms of the APOE gene — e2, e3 or e4 — from each parent. The e3 form is the most common, with 50 percent to 90 percent of individuals

having one or two copies.³⁹ The e4 form is the next most common, with 5 percent to 35 percent having one or two copies, and the e2 form is the least common, with 1 percent to 5 percent having one or two copies.³⁹ The estimated distribution of the six possible e2, e3 and e4 pairs is shown in Table 3.

Having the e4 form increases one's risk of developing Alzheimer's compared with having the e3 form, while having the e2 form may decrease one's risk compared with having the e3 form. Those who inherit one copy of the e4 form have three times the risk of developing Alzheimer's compared with those with the e3 form, while those who inherit two copies of the e4 form have an eight- to 12-fold risk.^{38,41-42} In addition, those with the e4 form are more likely to develop Alzheimer's at a younger age than those with the e2 or e3 forms of the APOE gene.⁴³ A meta-analysis including 20 published articles describing the frequency of the e4 form among people in the United States who had been diagnosed with Alzheimer's found that 56 percent had one copy of the APOE-e4 gene, and 11 percent had two copies of the APOE-e4 gene.⁴⁴ Another study found that among 1,770 diagnosed individuals from 26 Alzheimer's disease centers, 65 percent had at least one copy of the APOE-e4 gene.⁴⁵

TABLE 3

Estimated Percentages of the U.S. Population with the Six Possible e2, e3 and e4 Pairs of the Apolipoprotein E (APOE) Gene

APOE Pair	Percentage
e2/e2	0.5
e2/e3	11
e2/e4	2
e3/e3	61
e3/e4	23
e4/e4	2

Created from data from Raber et al.⁴⁰
Percentages do not total 100 due to rounding.



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