

# Alcoholism:

## Are Some People More Predetermined than Others?

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### Abstract

According to the National Institute of Alcohol Abuse and Alcoholism, nearly 17.6 million American adults abuse alcohol or are alcoholics. Alcoholism causes major social, economic, and public health problems. A review of the scientific literature was performed to investigate the common causes of alcoholism and predetermination for the disease. Signs and symptoms that increase the likelihood that one will become an alcoholic are presented. A strong correlation is seen between alcoholism and social background, genetics, and stress. It is not possible, however, to determine if someone will become an alcoholic. Drinkers and their friends should monitor personal alcohol intake and be knowledgeable of alcoholic symptoms.

### Introduction

According to the National Institute on Alcohol Abuse and Alcoholism, nearly 17.6 million American adults abuse alcohol or are alcoholics (1). Could you or I become one of those statistics? Alcoholism cuts across many societal boundaries, but factors such as genetics, stress, social background, and eating habits affect the development of alcoholism. For example, one study of a Swedish cohort found an increased risk of developing alcoholism if the men worked in an environment characterized by low control over their jobs and life (2). Just because someone comes from an alcoholic family does not mean that they will become an alcoholic and just because someone has no alcoholic tendencies in their family does not mean that they will not become an alcoholic. It is a mixture of many factors. Defined in 1992 by a 23-member multidisciplinary committee of the National Council on Alcoholism and Drug Dependence and the American Society of Addiction Medicine, alcoholism is a "primary, chronic disease with genetic, psychosocial, and environmental factors influencing its development and manifestations. The disease is often progressive and fatal. It is characterized by continuous or periodic: impaired control over drinking, preoccupation with the drug alcohol, use of alcohol despite adverse consequences, and distortions in thinking, most notably denial" (3). Alcohol addiction — physical dependence on alcohol — occurs gradually as drinking alcohol alters the balance of some chemicals in the brain, such as gamma-aminobutyric acid (GABA), which inhibits impulsiveness, and glutamate, which excites the nervous system. Alcohol also raises the levels of dopamine in the brain, which is associated with the pleasurable aspects of drinking alcohol. Excessive, long-term drinking can deplete or increase the levels of some of these chemicals, causing the body to crave alcohol to restore good feelings or to ignore negative ones (4).

### Method

A review of alcoholism and the causes and factors of this addiction and disease in peer reviewed literature, general medical literature, and online hospital resources was done to compile the information on this poster.

### Results/Discussion

Alcoholism is a disease that cuts across gender, social class, race, and geographic area. There are, however, some factors that predispose people to alcoholism. Genetics is the largest factor in determining alcoholism. There have been studies done using the P3 brain wave, which is connected with recognition and attention, and often differs between alcoholics and their close relatives and non-alcoholics (8). Changes in this wave's latency, amplitude and topography are correlated with increased risk for alcoholism. The concept behind the P3 brain wave is that it shows a heightened amplitude after a strong stimulus, so that those with lower P3 brain waves are less able to distinguish between significant and insignificant stimuli (8). In a study of younger populations, ages 7 to 15, the sons and daughters of alcoholics showed a smaller P3 wave amplitude, as well as slow visual responses, drawing a connection between genetics and alcoholism. Follow up with these children found that these abnormalities are significant predictors of subsequent adolescent and young-adult substance abuse (5). Another genetic factor is  $\beta$ -endorphin, which studies have found to be lower in non-alcoholic subjects with strong family histories of alcoholism compared to alcoholics with no family history. This is the 'opoid deficiency hypothesis,' that high-risk subjects have an inherited deficiency in the basal activity of the endogenous opoid system (5). Other studies have found that alcoholics have lower levels of some markers such as prolactin (5). However, these are just symptoms of the larger disease of alcoholism.

A study in Zurich of alcoholism, involving 841 men over a three-year period, established the following risk factors: lack of social integration, negative relations with parents, frequent relations with the peer group, heavy cigarette and cannabis consumption and lower social status of the father. These hint at the influence of social background on alcoholism (6). One study by Hawkins, Catalano and Miller divided alcoholic factors into three groups: home and environmental factors such as parental use and acceptance of alcohol, family conflict and peer attitudes towards alcohol; child behavioral practices such as rebellion, peer pressure, stress reduction; and societal norms such as alcohol laws, prominence of alcohol in the community, and neighborhood economic conditions (7).

### Conclusion

The major conclusion to draw out of this is that alcoholism does seem to have some correlation with genetics, but that it is also influenced by societal characteristics that range from person to person. Alcoholism is a complicated disease which has yet to be comprehensively explained and understood. The best thing that can be done is to monitor alcohol intake and look at familial history to check risk.

### References

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