

Alcohol and Cancer

Background

Alcohol is a cytotoxin that, once absorbed through the bloodstream, spreads throughout the body and can damage all organs, especially when consumed in large amounts. The International Agency for Research on Cancer (IARC) classified alcohol consumption as carcinogenic to humans as early as 1988⁴.

Approximately four percent of cancers worldwide are caused by alcohol use¹¹. In Germany, it is estimated that more than 20,000 new cases of cancer could be attributed to alcohol use in 2022². Drinking alcohol is one of the cancer risk factors that can be influenced by lifestyle. However, public awareness of the causal link between alcohol and cancer is low.

Carcinogenesis due to alcohol

The effect of alcohol use on cancer risk has been the subject of research for many decades, and there has been evidence that alcohol use is associated with several types of cancer. The main pathway of carcinogenesis is the metabolism of alcohol into carcinogenic acetaldehyde, which damages genetic

material (DNA)^{9,10}. In addition, alcohol causes oxidative stress in cells, promotes inflammatory processes, interferes with the regulation of the hormone oestrogen and impairs several other pathways; all this contributes to an increase in the risk of cancer. The mechanisms are different for different types of cancer¹⁰. Alcohol use promotes the development of cancer in the oral cavity, pharynx, larynx and oesophagus, as well as in the colon, rectum, liver and female breast¹⁰ (Fig. 1).

Significantly more men than women develop cancer caused by alcohol use¹². According to current calculations, in 2022 about 14,000 cases of cancer in men and 6,200 in women could be attributed to alcohol consumption². This represents 5.7 per cent of all new cancer cases in men and 3.4 per cent in women. The fact that more men than women develop cancer as a result of drinking alcohol reflects the different drinking patterns of men and women: Men drink alcohol more frequently and in larger quantities than women. Colorectal cancer accounts for the largest proportion of all cancers caused by alcohol consumption (45 per cent)².

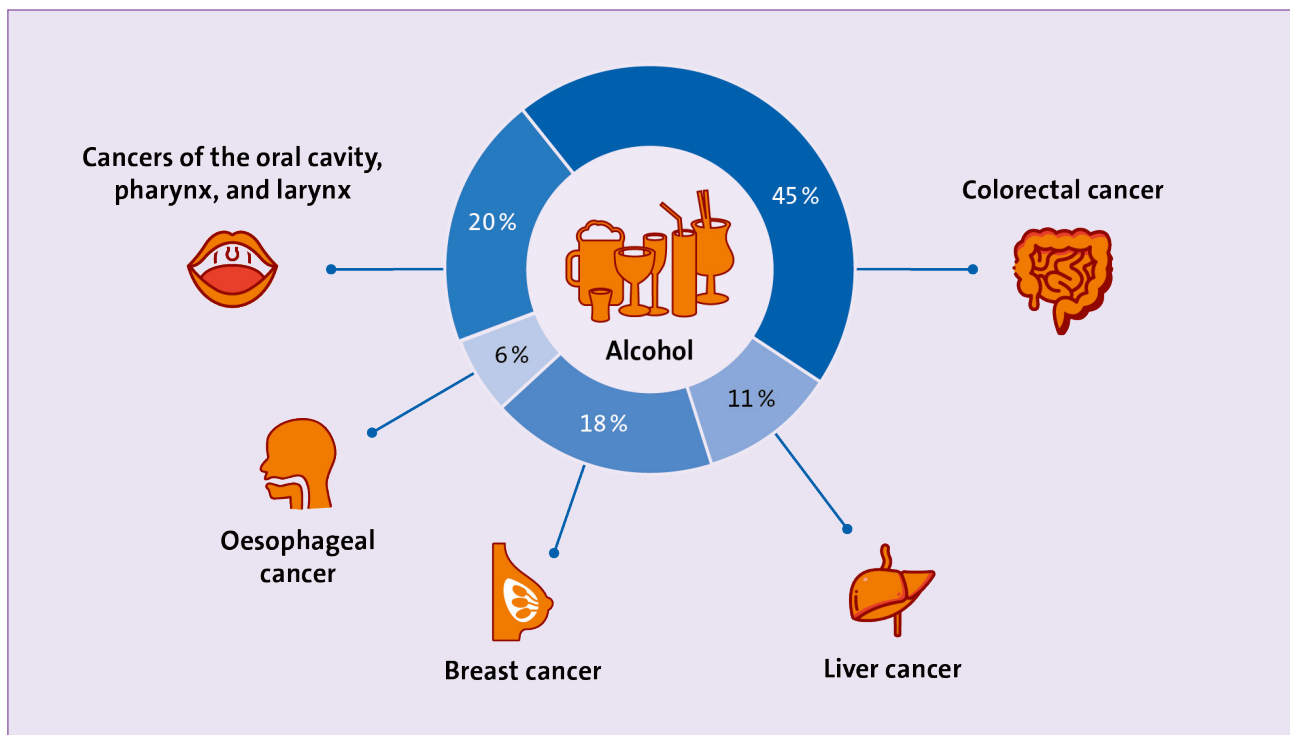


Figure 1: Types of cancer caused by alcohol and estimated proportions of new cancer cases caused by alcohol use out of all new cancer cases caused by alcohol in 2022. Source: Deutsches Krebsforschungszentrum 2022². Illustration: Bohm und Nonnen Büro für Gestaltung GmbH and German Cancer Research Center, Cancer Prevention Unit, 2023

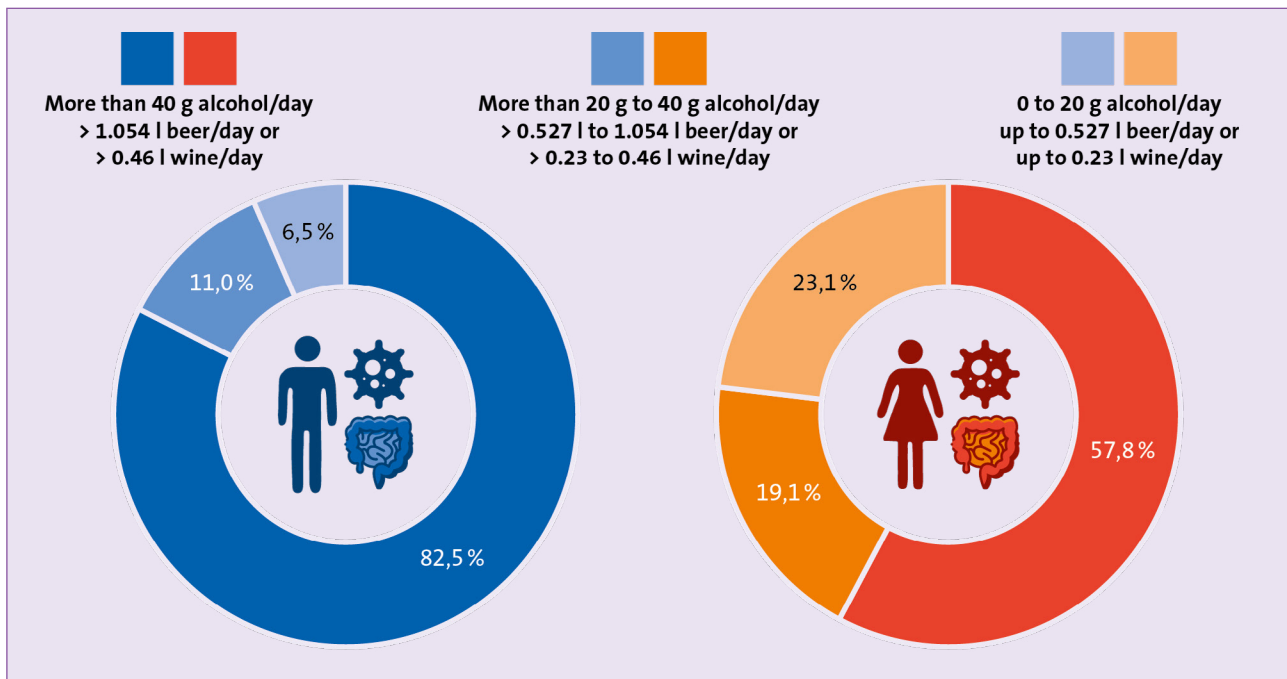


Figure 2: Proportion of colorectal cancer cases among all alcohol-related colorectal cancer cases according to the amount of alcohol consumed per day in men and women. Source: Rehm 2021⁸. Illustration: German Cancer Research Center, Cancer Prevention Unit, 2023

Alcohol drinking quantity and cancer risk

Alcohol is carcinogenic in any amount and in any form^{5,13}. Whether it is beer, wine or spirits, the carcinogenic effect is independent of the type of alcoholic beverage¹⁴. The risk of developing alcohol-related cancer increases with the amount and frequency of alcohol consumption^{8,14}. Even low levels of alcohol use can increase the risk of cancer. A standard glass of alcohol contains between 10 and 12 grams of pure alcohol, a standard glass being a small glass of beer, a glass of wine, a glass of champagne or a double shot of liquor. Even the low consumption of one standard glass of alcohol – up to 12.5 grams of alcohol – per day increases the risk of cancer of the mouth and throat, oesophagus and the female breast. Moderate consumption (12.5 to 50 grams alcohol per day) increases the risk of larynx and colorectal cancer. High consumption of more than 50 grams of alcohol per day increases the risk of cancer of the liver, stomach and pancreas.¹⁰ Most alcohol-related cancers are the result of drinking 20 to 50 grams of alcohol per day (Fig. 2) (30 to 50 grams per day for men, 10 to 30 grams per day for women).¹¹ After stopping consumption, the risk of developing cancer decreases; after

15 to 35 years, the risk is similar to a person who never drinks alcohol.^{1,6,7}

Alcohol and smoking

People using alcohol and tobacco have a much higher risk of developing cancer than people consuming alcohol or tobacco alone. Both substances increase each other's carcinogenic effects, especially in the mouth and oesophagus.³ Alcohol makes the oral mucosa more permeable. As a result, the harmful substances in tobacco smoke can be absorbed more easily.

Conclusion

There is no safe level of alcohol use. Any amount of alcohol as well as any type of alcoholic beverage increase the cancer risk. The more and the more regularly alcohol is consumed, the higher the risk of developing cancer. The combination of alcohol and tobacco increases the risk of cancer even more, as both substances reinforce each other. The best way to prevent cancer is not to drink alcohol at all.

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