

How Does Alcohol Increase the Risk of Cancer? | Dr. Andrew Huberman

One of the really bad effects of alcohol But that's extremely well documented is the fact that alcohol because of this toxicity of acetyl aldehyde and related pathways can alter DNA methylation It can alter gene expression That can mean many things in different tissues But it is associate with a significant increase in cancer risk in particular breast cancer And in particular because breast tissue is present in both males and females but in women it's especially vulnerable to some of the DNA methylation changes Well breast cancer in women has a relationship to alcohol intake and alcohol intake has a relationship to breast cancer in women In fact there has been proposed to be a anywhere from 4 to 13% increase in risk of breast cancer for every 10 g of alcohol consumed How much is 10 g Well there we need to think a little bit about the variation in the amount of alcohol in different drinks across the world Different countries serve different size drinks and have different concentrations of alcohol in those drinks So without going down too much of a rabbit hole and just giving you some good rules of thumb to work With there have been studies of the percentage of alcohol including different drinks and the sizes of different drinks that are served in different countries And here's a kind of a a patchwork of of those findings in Japan one beer one glass of wine or one shot of liquor as it's served there tends to include anywhere from 7 to 8 g of alcohol in the US one beer which generally is 12 ounces If it's in a bottle one glass of wine or a shot of liquor tends to include about 10 to 12 g of alcohol And in Russia one drink of the various sorts that I just described typically we have as much as 24 g of alcohol because of the differences in the concentration of alcohols and the sizes of drinks that are poured in these different countries Ok Of course there are other countries in the world Those countries are also vitally important but those are the ones that extracted from the studies that I could find What does this mean Well what we're talking about is that for every 10 g of alcohol consumed So that's one beer in the US maybe a little bit more than one beer in Japan or basically a third of a drink in Russia there's a 4 to 13% increase in risk of cancer That's pretty outrageous Right And you might think wait how could it be that you know this stuff is even legal Well look it's as I described before it's a toxin It's also a toxin that people enjoy the effects of I mean in the US at least they tried prohibition Um it certainly did lead yes did

lead to a reduction in alcohol induced health disorders in particular cirrhosis of the liver It also led to a lot of crime because it became a substance that a lot of people still wanted and that people were willing to break the law in order to provide or I should say to sell and provide But the point is that the more alcohol people drink the greater their increase of cancer in particular breast cancer And that's because of the fact that alcohol has these effects on cells that include changes in gene expression and cancer That is the growth of tumors is a dysregulation in cell cycles right A tumor is a aggregation or the proliferation aggregation is stuff sticking together by the way proliferation is stuff duplicating a proliferation aggregation of cells that could be a gliomas glial cells glioma brain tumor right could be lymphoma So within the lymph tissue et cetera the mutations that alcohol induces to cause this are wide ranging Some of those are starting to start to be understood for those of you interested in cell biology I'll just mentioned that the PD one pathway Again this is is super uh specializing for the aficionados only You don't need to know this The PD one pathway seems to be up regulated and and we knew this from the discussion earlier there's a down regulation in some of the anti inflammatory molecules that help suppress this proliferation of cancers Nowadays there's a lot of interest in the fact that the immune system is constantly combating cancers that exist in us all the time You know little little tumors start growing and our immune system goes and gobbles them up Little tumors start growing The immune system senses inflammation sends out these incredible cells these killers B cells and T cells and and and beats them up Cancers proliferate and take hold and cause serious problems When the proliferation of cells exceeds the immune system's ability to gobble up and remove those cells There are other mechanisms of regulating cancers but that's one of the primary one and alcohol hits it again It's a two hit model It increases tumor growth and it decreases the sorts of molecules that suppress and combat tumor growth So again even low to moderate amounts of alcohol can be problematic for the sake of cancers In particular breast cancers epidemiologists and health specialists love to try and compare different substances in terms of how bad they are Rarely do they compare substances in terms of how good they are Um But sometimes they do and what they'll sometimes tell you and what you can find in the literature is that ingesting 10 to 15 g of alcohol a day So that would be like one beer in the US or one glass of wine is the same as smoking 10 cigarettes a day Frankly it's hard to make that direct relationship really stick because you know it's a question of you know how long people

inhale do they have a predisposition to a lung cancer et cetera But even if that number is off by plus or minus two cigarettes or even if that number would be the equivalent of one glass of wine equals one cigarette per day I think there's general consensus now that nicotine consumed by vaping or by cigarette it's bad for us in terms of lung cancer and other forms of cancer And for some reason I don't know why because this knowledge about alcohol and cancer and these established relationships have been known since the late 1980s The first you know kind of landmark paper on this was published in 1987 I can provide a link to that paper It's actually quite interesting uh to read Well the relationship is there and yet we don't often hear about it right In fact in before researching this episode I had heard before that alcohol can increase cancer risk but I wasn't aware of just how strong that relationship is because of the serious nature of what we're talking about And because I would hate to be confusing or misleading to anybody I want you to just emphasize that this statistic that there is a 4 to 13% depending on which study you look at a 4 to 13% increase in the risk of cancer In particular breast cancer for every 10 g of alcohol consumed that's 10 g per day So that's one drink per day But I do want to emphasize that if that equates to seven drinks per week and all those seven drinks are being consumed on Friday and Saturday it still averages to 10 g per day And I also want to emphasize that there are things that people can do to at least partially offset some of the negative effects of alcohol as it relates to predisposition to the formation of certain kinds of tumors and cancers I also want to be clear before I say it that doing the things I'm about to tell you is not a guarantee that you're not going to get cancer nor is it a guarantee that alcohol is not going to lead to an increased predisposition for certain kinds of cancers And the two things are consumption of folate and other B vitamins especially B 12 You know the the consumption of folate and B 12 has been shown to decrease cancer risk in people that ingest alcohol but not completely offset it Why That is isn't exactly clear it probably has something to do with the relationship between FOLATE and B 12 and other B vitamins in gene regulation pathways that can lead to tumor growth at some point soon we will get an expert in cancer biology and in particular in breast cancer biology on the program and we can ask them about this But I realize this is going to raise a number of questions and maybe even cause some of you to go out there and start taking folate and other B vitamins and B 12 Not incidentally a lot of the reported hangover supplements and treatments have include folate and B 12 I don't know if they had the cancer literature in mind when they

created those supplements and and products I doubt they did Alcohol really does disrupt B vitamin pathways both synthesis pathways and utilization pathways So sometimes you'll hear oh you know if you get your B vitamins it helps you recover from from hangover more quickly Again the literature doesn't support that But also again there aren't a lot of studies but more to the point as it relates to alcohol in the formation of tumors and cancers it does appear that decreased folate and other B vitamins like B 12 are partially responsible for the effect of alcohol and increasing cancer risk And it does appear that consuming adequate amounts of folate and B 12 might again might partially really want a bold face and underline and highlight partially offset some of that increased risk