



# HCSP FACT SHEET

HCV ADVOCATE

• HCV AND THE LIVER •

## Alcohol and the Liver

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### Foreword

If you have chronic hepatitis C the best strategies to help keep your liver healthy is to stop drinking alcohol or to greatly reduce the amount of alcohol consumed. The damage to the liver caused by alcohol is well known, but there are additional problems that alcohol can cause to the health of people living with hepatitis C. Some of the potential problems include:

- Lower the immune response in people with hepatitis C
- Help the hepatitis C virus replicate or make more copies of itself
- May lower HCV treatment response
- Add to the emergence of HCV quasi-species
- Increase the level of iron stored in the liver
- Increase fat accumulation in liver cells

This fact sheet will focus on understanding how alcohol is absorbed, metabolized and distributed throughout the body and the damage that can occur with excessive or prolonged alcohol use.

When alcohol reaches the stomach it then goes to the small intestine where it passes into the blood stream. The stomach is the first organ that processes alcohol—about 20% is absorbed through the lining of the stomach and the remaining ~80% is absorbed through the small intestines. Once the alcohol enters the blood stream it is carried to and processed by the liver. After one drink of alcohol the concentration of alcohol in the blood peaks in about 30 to 45 minutes and drops back to normal levels in about an hour provided that no additional alcohol is consumed.

The liver is responsible for converting the alcohol into a substance that is safe for the body. Of note, there may be a very small amount of alcohol that does not reach the liver—this is excreted in the urine and breath. That's why breath analyzers are able to measure the amount of alcohol someone has consumed.

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The information in this fact sheet is designed to help you understand and manage HCV and is not intended as medical advice. All persons with HCV should consult a medical practitioner for diagnosis and treatment of HCV.

This information is provided by the Hepatitis C Support Project a nonprofit organization for HCV education, support and advocacy

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## **HCV – Alcohol and the Liver**

### **Liver**

There are certain liver enzymes that are responsible for converting alcohol into a safe substance: alcohol dehydrogenase (ADH), aldehyde dehydrogenase (ALDH) and cytochrome P450IIE1 (CYP2E1). ADH is the main enzyme responsible for converting alcohol. In people who are chronic alcohol drinkers the liver will make more CYP2E1 in an effort to compensate for excess alcohol intake. Unfortunately, the extra production of CYP2E1 does not do much to stabilize the effects of long-term alcohol abuse that damages the liver.

For people without liver disease, chronic alcohol abuse will lead to the deposit of fat in the liver cells, leading to inflammation and cell death. After a time the cell death will cause light scarring of the liver and after years of chronic alcohol abuse the liver can develop cirrhosis. If you combine the effects of alcohol abuse and hepatitis C the damage to the liver can be much faster.

There are differences in what causes intoxication in people. Some factors that influence the degree of absorption and, therefore, intoxication include:

- The amount of alcohol consumed in a certain timeframe—the liver can only metabolize a certain amount of alcohol per hour.
- The rate of metabolism differs depending on the amount of ADH and ALDH enzymes in the liver and this differs by gender, race and ethnicity.
- Food can affect the amount of alcohol absorbed by the body. If there is food in the stomach it can slow down the absorption of alcohol. Foods high in carbohydrates and fat help to slow down the process of the stomach pushing the food (and alcohol absorbed) into the small intestine and therefore how long it takes for the alcohol to be absorbed. Mixing alcohol with beverages can also affect the absorption of

alcohol—alcohol mixed with fruit juice or water is absorbed more slowly than alcohol mixed with carbonated beverages.

- Muscle tissue contains more water than fat tissue so the more muscle tissue a person has the more diluted the alcohol will be.

### **Gender Differences**

There are differences in the way that men and women metabolize alcohol. The amount of body water affects the rate at which alcohol is absorbed. In general, women have higher body fat composition (less body water); men have a higher body composition of muscle (more body water). For this reason women will have higher concentrations of alcohol in their bodies than men who consume equal amounts of alcohol. In addition to gender differences, total body water composition decreases as people age so a person over 60 years old has less total body water than someone under 40 years old.

But the main reason why women metabolize alcohol differently is that they have less of the enzyme called ADH. ADH is responsible for converting alcohol into levels that the liver can handle or process safely. This means that women who drink the same amount of alcohol as men will absorb twice as much alcohol into the bloodstream than a man who drinks the same amount.

This is the reason for the different recommendation of alcohol use for healthy men and women (without liver disease): Women should not drink more than 1 alcoholic drink a day and men should not drink more than 2 alcoholic drinks per day.

### **Alcohol and Genetics**

Alcohol affects some racial and ethnic groups differently. For instance, some East Asians, Aboriginal Australians, and native Americans are

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known to be deficient in aldehyde dehydrogenase (ALDH) an enzyme produced by the body that is one of the enzymes responsible for converting alcohol into safe levels. Typically, these populations have a higher incidence of alcoholism compared to other racial and ethnic groups who have higher levels of ALDH and lower rates of alcoholism.

### **Excess Alcohol**

The liver can only absorb and metabolize so much alcohol during a certain time period. The excess alcohol is distributed to other areas throughout the body can affect other bodily organs and a person's psychological well-being.

Excess or abuse of alcohol use can cause a variety of problems including:

- Hypertension (high blood pressure)
- Irritation of the gastrointestinal system causing ulcers, gastritis, and inadequate absorption of nutrients
- Central nervous system disorders, including brain disorders, vitamin B deficiency, and peripheral neuropathy (numbness and pain in the extremities)
- Male and female sexual impotence
- Depression, anxiety, and many other psycho social problems





Drinking excessive amounts of alcohol in addition to having chronic hepatitis C will decrease the way your body is able to control hepatitis C and will lead to a faster and more serious liver disease progression and overall damage. If you cannot stop drinking consider seeking help from family, friends, counselors and medical providers. Alcoholism is an insidious disease that affects millions of people and destroys many lives. Resources listed at the end of this fact sheet can offer help and guidance to stop drinking.

### ***Alcohol Facts from Drug Rehabs.org***

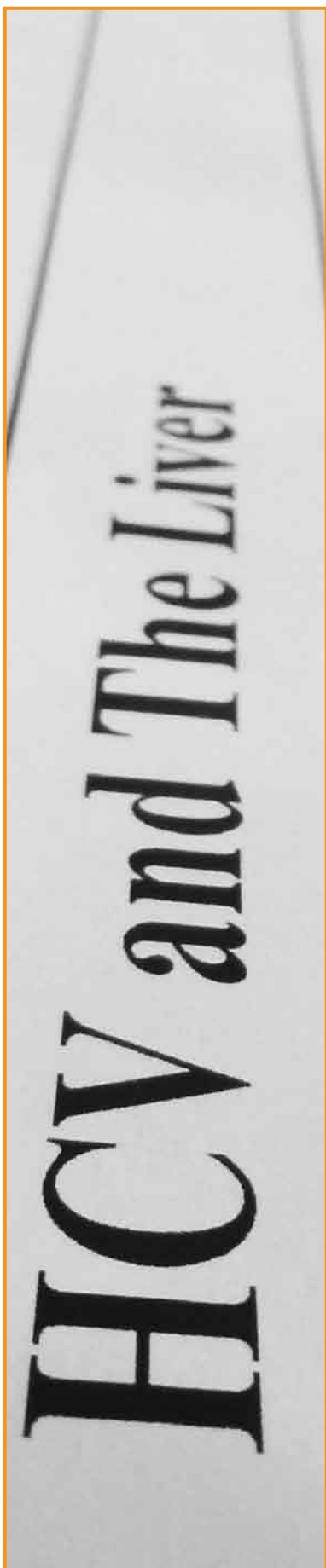
- Between 2% and 3% of the current American college population will die from alcohol-related causes.
- Thirty percent of college failure is alcohol related.
- Drinking and driving is the number one killer of Americans between the ages of 17-24.
- In the U.S., 70 people are killed daily in drunk driving accidents, that is roughly one person killed every 22 minutes.
- 69% of all drownings are alcohol-related.
- One in every three suicides involves alcohol.
- The average female college student spends \$150.00 per year on alcohol.
- The average male college student spends \$300.00 per year on alcohol.
- The average DUI arrest costs the charged person \$3000.00.
- Alcohol plays a role in 50% of all arrests.
- 90% of the vandalism that occurs on college campuses is a result of alcohol use.
- 75% to 90% of campus rapes involve alcohol use.
- 75% of men and 50% of women involved in sexual assaults had been drinking prior to the assault.
- The abuse of alcohol is present in 70% of all murders and other violent crimes.
- 54% of alcoholics have an alcoholic parent.
- One out of 3 Americans don't drink - and that's okay too.

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## Standard drink equivalents

	<p><b>Beer or cooler</b>                      12 oz.,                      ~5% alcohol</p>	<p>12 oz. = 1                      16 oz. = 1.3                      22 oz. = 2                      40 oz. = 3.3</p>
	<p><b>Malt liquor</b>                      8-9 oz.,                      ~7% alcohol</p>	<p>12 oz. = 1.5                      16 oz. = 2                      22 oz. = 2.5                      40 oz. = 4.5</p>
	<p><b>Table wine</b>                      5 oz.,                      ~12% alcohol</p>	<p>a 750 mL (25 oz.)                      bottle = 5</p>
	<p><b>80-proof spirits</b>                      (hard liquor),                      1.5 oz.,                      ~40% alcohol</p>	<p>a mixed drink = 1 or more*                      a pint (16 oz.) = 11                      a fifth (25 oz.) = 17                      1.75 L (59 oz.) = 39</p>

\* Depending on factors such as the type of spirits and the recipe, one mixed drink can contain from one to three or more standard drinks.  
 Source: NIAAA



### Related Publications

- **Alcohol and HCV**  
[www.hcvadvocate.org/hepatitis/factsheets\\_pdf/Alcohol%20and%20HCV.pdf](http://www.hcvadvocate.org/hepatitis/factsheets_pdf/Alcohol%20and%20HCV.pdf)
- **Tips for Staying Alcohol-Free at Social Events**  
[www.hcvadvocate.org/hepatitis/factsheets\\_pdf/Tips\\_Alcohol.pdf](http://www.hcvadvocate.org/hepatitis/factsheets_pdf/Tips_Alcohol.pdf)
- **An Introduction to the Liver**  
[www.hcvadvocate.org/hepatitis/factsheets\\_pdf/The%20Liver.pdf](http://www.hcvadvocate.org/hepatitis/factsheets_pdf/The%20Liver.pdf)

### For more information

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| <ul style="list-style-type: none"> <li>• <b>Medline Plus</b><br/> <a href="http://www.nlm.nih.gov/medlineplus/alcohol.html">www.nlm.nih.gov/medlineplus/alcohol.html</a></li> <li>• <b>National Institute on Alcohol Abuse and Alcoholism (NIAAA)</b><br/> <a href="http://www.ncbi.nlm.nih.gov">www.ncbi.nlm.nih.gov</a></li> </ul> | <ul style="list-style-type: none"> <li>• <b>Alcoholics Anonymous</b><br/> <a href="http://www.alcoholics-anonymous.org">www.alcoholics-anonymous.org</a></li> <li>• <b>HCV Anonymous</b><br/> <a href="http://www.hcvanonymous.com">www.hcvanonymous.com</a></li> </ul> |
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