



Institute for Women's Health Research
Putting Women's Health First

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[Sex Differences in Alcohol](#)

[Metabolism](#) According to the World Health Organization, alcohol is one of the most significant risk factors for diseases including chronic conditions like cancer, diabetes, and heart disease.

Dear Friends and Colleagues,

According to the National Institutes of Health, alcohol presents yet another health challenge for women. Much of our information about the effects of alcohol on the body comes from male-oriented studies but as more researchers study both sexes, we are discovering significant differences. Even in small amounts, alcohol affects women much more than men. Based on human studies, women are more sensitive to the consumption and long-term effects of alcohol than men. Furthermore, women have more difficulty physically managing the consequences of overuse.

In this edition, we focus on the sex differences related to alcohol consumption. We encourage you to periodically check our [web site](#) and [blog](#) as new information becomes available.

The Institute Staff



INSTITUTE FOR
WOMEN'S HEALTH
RESEARCH™

AT NORTHWESTERN UNIVERSITY

Women and Alcohol

Among the women who drink (60% of U.S. women have at least one drink a year), 13% have more than seven drinks a week. This level exceeds the recommendations found in the Dietary Guidelines of Americans, published by the U.S. Department of Agriculture and the Department of Health and Human Services. These Guidelines define moderate drinking as no more than one drink a day for women and no more than two per day for men. It is estimated that 1.5 million U.S. individuals abuse or are dependent on alcohol and approximately one-third are women.

Physiological Factors

Women are at greater risk than men for developing alcohol-related



problems. They experience physical impairment earlier in their drinking history despite having consumed less alcohol. The limited research on women focuses on how alcohol is metabolized once it enters the body. We do know that alcohol passes through the digestive tract and is dispersed throughout the water in the body. The more water available, the more diluted the alcohol. Pound for pound, women have less water in their bodies than men. When men and women of the same weight consume equal amounts of alcohol, women obtain a higher blood concentration. Therefore, a woman's brain, liver and other organs are exposed to more of the toxic byproducts of alcohol.

The diminished activity of alcohol dehydrogenase (a primary enzyme involved in the metabolism of alcohol) in the stomach may contribute to a women's heightened vulnerability to alcohol toxicity to the other organs. This process is referred to as "first pass metabolism".

Increasing evidence suggests that the detrimental effects of alcohol in the liver are more severe in women, leading to alcoholic liver disease after a comparatively shorter period of heavy drinking and at a lower level of daily drinking than men. There is some suggestion that the combined effect of estrogens and alcohol may augment liver damage. Heavy alcohol use also harms bones and increases the risk of osteoporosis.

Alcohol and the Reproductive System

Early literature suggested that changes during the menstrual cycle may influence the rate of alcohol metabolism, but more recent reviews do not find consistent effects. Later studies by Romach and Sellers did find significant hormonal changes in postmenopausal women who consume alcohol (1). Women taking menopausal hormone therapy, and consuming 14 or more standard drinks weekly had significantly higher estradiol levels, which are associated with increased risk for heart disease and breast cancer. Menstrual disorders are also associated with chronic heavy drinking and can have adverse effects on fertility.

Alcohol across a Woman's Lifespan

During adolescence, despite being illegal in the U.S., about 37% of 9th grade girls, report drinking in the past month (slightly more than boys). Seventeen percent of these same girls report having had five or more drinks on a single day in the previous month. Young women who drink are more vulnerable to sexual assault and unsafe sex. Both girls and boys who begin drinking before age 15 have a 40% higher risk of developing alcohol abuse or alcoholism sometime in their lives than those who do not drink till they are 21.

Middle-aged women are more likely to drink than older women and there is no single factor that predicts who will drink more. However, research suggests that women who have relationship problems drink more; and heavy drinking is more common among women who have never married, are living with an unmarried partner or are divorced. Depression is closely linked with heavy drinking in women.

Women drink less when they are older, however, that trend seems to be shifting. Aging reduces the body's ability to adapt to alcohol. Older adults reach higher blood levels of alcohol even when drinking the same volume as a younger person. This is due, in part, because the amount of water our bodies contain is reduced as we age. Heavy alcohol use can result in memory deficits and may increase the risk for Alzheimer's disease in both sexes, but particularly in women, who are more vulnerable to alcohol induced brain damage (2). Alcohol problems among older people are often mistaken for other age-related conditions, thus delaying appropriate intervention.

Race and Ethnic Differences

Black women are more likely to abstain from alcohol than white women, but equal portions of black and white women drink heavily. Data from self-report survey suggest that Hispanic women are infrequent drinkers or abstainers, but this may change as they enter new social and work areas. Studies have demonstrated a higher level of drinking among younger, American-born Hispanic women (3).

What are the Benefits and Risks of Moderate Drinking?

Moderate drinking (one drink/day for women) can have both short- and long-term health effects:

Benefits:

May lower the risk for coronary heart disease, mainly among women over the age of 55.

Risks:

May cause impaired driving, and increase chance of being killed in a single car accident.
Can reduce the effectiveness of some medications, and can combine with other medications to increase negative side effects.
Research suggests that as little as one drink per day can slightly raise the risk of breast cancer in some women, especially if they are postmenopausal or in a high-risk family.
Puts pregnant women at risk for Fetal Alcohol Syndrom.
May lead to alcohol abuse or alcohol dependency.

Heavy drinking can result in liver disease, brain disease, cancer, and heart disease. Excessive drinking over the long-term is more likely to damage a woman's health than a man's, even if the woman has been drinking less alcohol for a shorter length of time.

Sources:

(1). McCance-Katz and Kosten, eds. *New Treatments for Chemical Addictions*. (1998).
(2). Sohrabji , F. *Alcohol Research and Health* 26(4). 2002.
(3). Gilbert,J. *Hispanic Journal of Behav. Sci*, 9(3), 1987.
[Substance Abuse Treatment: Addressing the Specific Needs of Women](#). USDHHS Publication.
[National Institute on Alcohol Abuse and Alcoholism](#). NIH Publication #03-4956 (2008).

Upcoming Events

July 16, 2010

[What a Difference an X Makes: The State of Women's Health Research](#)

Location: Barbara Jordan Conference Center, Washington, DC

July 19-21, 2010

[20th Annual Maternal and Child Health Leadership Conference](#)

Leadership, Legacy and Community: A Retreat to Advance Material and Child Health Scholarship and Practice

Location: Hyatt Lodge at McDonald's Campus, Oak Brook, IL

July 26-28, 2010

[4th National Conference on Women, Addiction and Recovery](#)

Location: Chicago Marriott Downtown, Chicago, IL

Health Tip:

A standard drink equals:

- One 12 ounce bottle of beer or wine cooler; or
- One 5-ounce glass of wine; or
- 1.5 ounces of 80-proof distilled spirits.

The alcohol content of different brands can vary substantially so these standards are not absolute. The alcoholic content in a beverage is determined relative to its proof, which is twice the alcohol content. For example, a glass of 24 proof wine would be 12 percent alcohol. A drink that is 40 percent alcohol would be 80 proof.

Staff News:

Dr. Candace Tingen, PhD comes on board as Director of Research Programs and Coordinator of the Illinois Women's Health Registry beginning in July. Dr. Bristol-Gould (former Director and Coordinator) has accepted a new position within Northwestern University. Candace earned her bachelor's degrees in Biology and Women's Studies from Duke University in Durham, NC and recently earned her PhD in the lab of Dr. Teresa Woodruff studying ovarian development before puberty. Candace has an interest in using her background as a scientist in order to better serve researchers who are interested in the multitude of benefits that come with participation of the group of

highly motivated, forward-thinking women that make up the Illinois Women's Health Registry. She is also very interested in helping these women contribute to the improvement of women's health through the growth and expansion of the registry.

Please join the [Illinois Women's Health Registry](#). To date, more than 4,550 female Illinois residents are participating, and 1,028 have been contacted for possible study participation.

Why should you join?

To gain **access** to groundbreaking research studies and clinical trials.

To help improve **prevention** and **treatment** of certain diseases and health conditions.

To **improve** women's healthcare by making you more aware of your own health issues.

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