

BEYOND THE BASICS

Binge Drinking

*What is binge drinking?*¹⁻⁴

In Canada, a standard drink of alcohol (ethyl alcohol or ethanol) contains 13.6 grams or 17 mL of absolute alcohol – the amount contained in a 12-ounce (341 mL) bottle of regular (5%) beer, five ounces (142 mL) of (12%) of table wine or 1.5 ounces (43 mL) of 80-proof liquor.

Episodic, or binge drinking, refers to the consumption of five or more drinks in one sitting for men, and four or more drinks in one sitting for women, at least once within a one-month period. Generally speaking, this drinking of excessive amounts of alcohol is deliberate and with the intent of becoming “drunk.” Binge drinking is also referred to as bout drinking, intensive drinking, spree drinking or heavy drinking.

*Medical Use*⁵

Studies have shown that when individuals participate in healthy lifestyles – including abstinence from smoking, maintaining a healthy weight (including an appropriate BMI, or body mass index), incorporating daily exercise and following a healthy diet – consumption of moderate amounts of alcohol (one drink a day for women and one or two drinks a day for men) may reduce their risk of heart disease.

Studies of alcohol’s role on classic risk factors, biomarkers and imaging parameters reinforces the positive effects of alcohol on protection of the heart; however, it is clear the benefits are short-lived and are only sustained with continued use of moderate amounts of alcohol. Further, the research clearly demonstrates binge drinking erases any health benefits to the heart and/or other systems and is, in fact, associated with increased myocardial infarction risk and all-cause mortality.

Although some physicians may recommend alcohol in moderation, this is not common medical practice. If a person is generally healthy and does not drink, it is not recommended the person begin drinking alcohol for any potential health benefits.⁶

Prevalence of Use

Young men with a family history of alcoholism are most at risk for alcohol misuse. Psychiatric illness and illicit drug abuse are also highly prevalent among people who misuse alcohol.⁷

The 2004 Canadian Campus Survey, funded by the Canadian Institutes of Health Research, identified that alcohol was used by 85.7% of students in the past year and by 77.1% of students in the previous 30 days. A total of 27.8% of the students reported

heavy drinking patterns (16.1% drinking more than five drinks daily and weekly drinking; 11.7% drinking more than five drinks daily and less than weekly drinking). The study also reinforced that men are more likely to be heavy frequent drinkers.⁸

The 2008 Canadian Alcohol and Drug Use Monitoring Survey (CADUMS) of Canadians 15 years of age and older reinforces these findings. While most respondents (77.3%) reported drinking in the previous 12 months, the prevalence for youth ages 15 to 24 for heavy infrequent drinking (drinking less frequently than once a week and consuming five or more drinks on each drinking occasion) was almost five times higher (12.7%) than for adults 25 years and older (2.6%). The prevalence of heavy frequent drinking (drinking one or more times per week and usually consuming five or more drinks on each occasion) among youth (13.5%) was almost four times higher than the rates for adults 25 years and older (3.6%).⁹

This pattern of drinking is associated with a range of both immediate and potential negative academic, social and health effects. In addition, other individuals present – whether as participants in the binge drinking or not – may experience negative effects as a result of someone else’s binge drinking behaviour.

Of significant concern is the association between underage use of alcohol with brain damage and cognitive deficits, with implications for learning and intellectual development. Impaired intellectual development may continue to affect individuals into adulthood.⁹ Furthermore, participating in these drinking patterns at young ages appears to predispose the individuals to problems with alcohol later in their lives.¹⁰

Pharmacokinetics

Alcohol is mainly absorbed into the bloodstream through the small intestine. As a small molecule with both lipophilic and hydrophilic properties, ethanol is then widely distributed in tissues throughout the body.

When consumed, ethanol is primarily metabolized in the liver by alcohol dehydrogenase (ADH) through oxidization to acetaldehyde.⁵ For the average person, alcohol is metabolized at the rate of about two-thirds of a standard drink per hour. However, with aging or chronic disease, the liver may not function as efficiently and the rate of metabolism will be slowed.⁶

Generally, women require less alcohol to reach the same blood alcohol concentration (BAC) as men. Two factors are largely responsible for this disparity. First, women tend to have smaller physical statures than men and their bodies contain less water in which to dilute the alcohol, resulting in a relatively higher BAC after drinking the same volume of alcohol.⁶ In addition, women have less of a gastric form of ADH than do men. This results in more unchanged alcohol entering a woman's bloodstream. Importantly, women develop alcohol-related health problems, such as cirrhosis of the liver, with lower levels of alcohol use over a shorter period of time than men.⁶

Genetic factors account for about one-half of the pharmacokinetic and pharmacodynamic effects of alcohol.¹¹

Pharmacodynamics

As a central nervous system (CNS) depressant, alcohol affects the CNS in direct proportion to the amount of alcohol in the bloodstream.⁶ With continued consumption, a person will experience a gradual reduction in the level of consciousness, from drowsiness to light sleep, deeper sleep, coma and possibly death.⁶

In 2003, the U.S. Department of Health and Human Services released a report that linked a genetic factor to a possible predisposition among young people to excessive or harmful drinking habits. The research found students who shared a particular variant of the serotonin transporter gene (5HTT) consumed more alcohol per occasion, more often drank with the intention of getting drunk and were more likely to engage in binge drinking than students without this particular genetic variant.¹²

Short-term Effects

Usual effects of small doses of alcohol are euphoria, drowsiness, dizziness, flushing and release of inhibitions and tensions.¹

Larger doses produce slurred speech, staggering, double vision and stupor. Alcohol, even in fairly low doses, impairs the ability to drive or to operate complex machinery. In combination with other drugs, the effects of the alcohol may be exaggerated. Large doses of alcohol consumed over a relatively short period of time can result in short term memory loss (black outs) or unconsciousness.^{1,13}

A study of adolescent binge drinkers found that even relatively infrequent exposure to large amounts of alcohol during the teen years may compromise the integrity of the brain's white matter, which is critical for the efficient relay of information within the brain. The teen binge drinkers who were studied exhibited lower levels of white matter fibre coherence, as measured in 18 separate areas of the brain, relative to the controls. These findings could indicate a risk factor for increased alcohol use, or it may indicate results of excessive use of alcohol.¹⁴

Long-term Effects

Regular consumption of more than two drinks a day may gradually produce damage to a number of vital organs and systems, including the liver, pancreas, stomach, brain, heart and reproductive system. Heavy use over a long period of time may result in stomach ulcers, vitamin deficiencies, impotence, decreased sperm production, infertility, certain types of cancer, emotional changes, brain damage and memory loss (including blackouts), and circulatory problems.¹⁵ Chronic heavy use may result in disruption of the drinker's social, family and working life.^{1,13}

Toxic Effects

Very large doses of alcohol can block the brain's control over respiration and result in death.⁶ Binge drinking specifically can cause alcohol poisoning resulting in vomiting, unconsciousness and sometimes death.¹⁵

Up to ten years ago, it was thought approximately 80% of alcohol-related deaths in Canada were due to chronic disease associated with use of alcohol. Recent estimates indicate the rates of chronic disease attributed to alcohol misuse are lower, and conversely, the rates of alcohol-related deaths resulting from acute causes are higher, particularly accidents and suicides. It is now believed acute causes account for half of all alcohol-related deaths.¹

Tolerance and Dependence

Regular use of alcohol induces tolerance, making increased doses necessary to produce the desired effect. After chronic use, people may drink steadily without appearing to get drunk. Their condition may go unrecognized, even by themselves, for some time. Chronic drinkers are likely to become both physically and psychologically dependent.¹

Withdrawal

Withdrawal symptoms from alcohol range in severity and will manifest depending on an individual's physical condition and the duration and extent of his or her relationship with alcohol.

After a night of binge drinking, an individual may experience withdrawal commonly referred to as a "hangover." Withdrawal symptoms may include headache, shakiness, light and sound sensitivity, jumpiness, insomnia, sweating, nausea and vomiting. A person who has been misusing alcohol over a sustained period of time may also experience withdrawal symptoms that include aches and pains, increased blood pressure, rapid pulse and breathing, tremors, seizures, hallucinations, depression, convulsions and even death.^{1,13}

Medical supervision is recommended for dependent drinkers who are attempting to stop their alcohol use or who are already experiencing significant withdrawal symptoms.

Legal Issues

The sale of alcohol and use of alcohol in public places is subject to both federal and provincial legislation.⁶

Purchase and consumption of alcohol in Manitoba is restricted to persons 18 years of age or older. Section 93 (3) of the *Manitoba Liquor Control Act* identifies the exception to the consumption of alcohol by minors. Purchasing alcohol on behalf of a minor is illegal.

With respect to the impacts of excessive alcohol use, the courts in many jurisdictions across Canada have found that alcohol providers have a "duty of care" to prevent incidents resulting from excessive alcohol use that may lead to injury. This duty of care requires the alcohol provider – whether it be a bartender, server or an individual hosting a party in their own home – to take reasonable steps to prevent harm occurring to an intoxicated person, particularly since the courts have recognized that an intoxicated person is not able to exercise that care for him or herself because of impaired judgment.⁶

In Canada, two levels of government deal with impaired driving. The federal Criminal Code is applied at BACs of 80 mg/dL and over (which generally occurs when a male consumes five drinks and a woman consumes four drinks within

a couple of hours¹¹). In addition, Manitoba imposes license suspensions of four to 24 hours on drivers whose BAC is 50 mg/dL or over.¹⁶

Risks & Other Harms

Alcohol mixed with any other drugs, particularly other CNS depressants, is particularly dangerous and potentially fatal.¹⁵

With harmful alcohol use, there are potential adverse consequences related to the law, a person's financial situation, family relationships, and generally putting oneself at risk by participating in unsafe behaviours while under the influence of alcohol.⁷

The 2004 Canadian Campus Survey found that 43.9% of undergraduates reported at least one indicator of harmful drinking, such as feeling guilty, experiencing memory loss or an injury and having others express concern about their drinking. The most common harms reported by these students were experiencing a hangover (53.4%), memory loss (25.4%), regrets (24.5%) and missing classes due to a hangover (18.8%). Hazardous alcohol-related behaviours were reported by students, including unplanned sexual relations (14.1%), driving after drinking too much (7.4%), engaging in unsafe sex (6.0%) and driving while drinking (3.8%).⁸

Pregnancy & Lactation

Consumption of alcohol during pregnancy may result in infants being born with a fetal alcohol spectrum disorder (FASD).³ FASD is caused by exposure to alcohol during pregnancy; however, effects of alcohol on the fetus vary widely. These effects may include cognitive, behavioural, physiological or physical impairments.

It is uncertain how much alcohol will produce adverse effects on a fetus; however, it appears the greatest risk of harm to the fetus arises from binge drinking and frequent drinking (more than seven drinks a week).⁶

Alcohol consumed by a nursing mother can pass through breast milk to the nursing baby and affect the baby's sleep patterns. In addition, the exposure to alcohol may influence the baby's gross motor development and early learning. Alcohol use may slightly reduce milk production and impair milk release.¹⁵

Interventions

Good patient-doctor communication is an essential risk management approach. A comprehensive medical history puts physicians in the best position to determine appropriate interventions.⁴

Continued ...

Identifying a patient's problem with alcohol is an important role for general practitioners. The CAGE questionnaire can be an effective tool to assist in problem identification. Two affirmative answers within the context of the following questions can predict with 90% reliability that the patient has an alcohol use disorder:

- Have you felt you needed to **C**ut down on your drinking?
- Have you felt **A**nnoyed by criticism of your drinking?
- Have you felt **G**uilty about drinking?
- Have you felt you needed a drink first thing in the morning (**E**ye-opener)?⁷

Brief motivational interventions by a healthcare practitioner take less than five minutes and are highly effective in encouraging problem drinkers to address their heavy drinking.⁷

Several pharmaceutical therapies are available to assist problem drinkers. These include the alcohol abuse deterrent disulfiram (Antabuse®) and the opioid receptor antagonist naltrexone (ReVia®). While the use of disulfiram has declined over the past several decades, naltrexone shows some promise in reducing alcohol consumption and preventing relapse. Compliance with naltrexone therapy is poor due to its gastrointestinal side effects.⁷

Treatment can also involve detoxification and traditional behaviour-oriented therapies, such as individual counselling, group or family therapy, contingency management and cognitive-behavioural therapies.¹⁰

Substance Use & Mental Health

- Substance use and mental health problems can often occur together. This is commonly referred to as a co-occurring disorder.
- Substance use may increase the risk of mental health problems.
- People with mental health problems are at higher risk of developing substance abuse problems:
 - Sometimes they use alcohol and other drugs in an attempt to relieve themselves from mental health symptoms.
 - For most people alcohol and other substance use only covers up the symptoms and may make them worse.

Remember: A person's experience with any drug can vary. Here are a few of the many things that may affect the experience: the amount and strength of the drug taken, the setting, a person's mood and expectations before taking the drug, gender, overall health, past experience with that drug and whether more than one drug is being used at the same time. Using alcohol and other drugs at the same time can also be dangerous.

Sources

1. Canadian Centre on Substance Abuse. *Alcohol Overview*, 2009. Available at <http://www.ccsa.ca/Eng/Topics/SubstancesAndAddictions/Alcohol/Pages/default.aspx>
2. Canadian Centre on Substance Abuse. *Glossary, Binge Drinking*, 2009. Available at <http://www.ccsa.ca/Eng/KnowledgeCentre/OurDatabases/Glossary/Pages/index.aspx>
3. Canadian Centre on Substance Abuse. *Introduction to FASD Overview*, 2008. Available at <http://www.ccsa.ca/Eng/Topics/Populations/FetalAlcoholSpectrum/Pages/FASDOverview.aspx>;
4. Canadian Centre on Substance Abuse. *Substance Abuse in Canada: Current Challenges and Choices*, Ottawa, ON, 2005.
5. Fenske, T. K. "Alcohol and the heart: a look at both sides," *Perspectives in Cardiology*, Vol. 24, No. 5, 2008.
6. Health Canada website. *Canadian Alcohol and Drug Use Monitoring Survey 2008*. Available at http://www.hc-sc.gc.ca/hc-ps/drugs-drogues/stat/_2008/summary-sommaire-eng.php#alc
7. George, T. P. *Alcohol Use and Misuse*. Canadian Medical Association website, 2007. Available at <http://www.cmaj.ca/cgi/content/full/176/5/621>
8. Centre for Addiction and Mental Health. *Canadian Campus Survey 2004 Highlights*. Available at http://www.camh.net/Research/Areas_of_research/Population_Life_Course_Studies/canadian_campus0905.pdf
9. Zeigler, D. W., et al. "The neurocognitive effects of alcohol on adolescents and college students," *Science Direct*, 2004. Available at http://www.madd.org/docs/21/Brain_article_Prev_Med.pdf
10. National Institute on Alcohol Abuse and Alcoholism. *Alcohol Alert*, No. 59, 2003.
11. Frezza, M., di Padova, C., Pozzato, G., Terpin, M., Baraona, E. & Lieber, C. S. "High blood alcohol levels in women: the role of decreased gastric alcohol dehydrogenase activity and first-pass metabolism," *NEJM*, Vol. 322, No. 2, 1990, p. 95-99.
12. Oxford Journals – Medicine. *Alcohol and Alcoholism*, Vol. 42, No. 2, 2007. Available at <http://alcalc.oxfordjournals.org/content/vol42/issue2/index.dtl>
13. Oxford Journals – Medicine. *Alcohol and Alcoholism*, Vol. 38, No. 5, 2003. Available at <http://alcalc.oxfordjournals.org/cgi/content/full/38/5/446>
14. Alberta Health Services (AADAC). *The ABCs Alcohol*, 2010. Available at http://www.aadac.com/87_149.asp
15. Kain, D. "Binge drinking may hamper information relay system in teens," *UCSanDiego News Center*, 2009. Available at <http://ucsdnews.ucsd.edu/newsrel/health/04-09BingeDrinking.asp>
16. Addictions Foundation of Manitoba (AFM). *The Basics: Alcohol*, 2005.
17. Canada Safety Council. *Blood Alcohol Limits – Canada and the World*, 2006. Available at <http://archive.safety-council.org/info/traffic/impaired/BAC-update-06.html>

The Addictions Foundation of Manitoba (AFM) offers a broad range of prevention and treatment services for alcohol, other drugs and gambling. These are designed to meet the needs of all Manitobans and include harm reduction and abstinence-based programs.

For more information, contact your local AFM office or visit our website: www.afm.mb.ca.

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