The Australian Wine Research Institute

Fact Sheet
WINE AND HEALTH

How a glass of wine affects the body

Introduction

A glass of wine affects different people in different ways and may affect the same person in different ways on different occasions. A standard amount of wine consumed will not result in a standard effect between any two consumers. Body size, food consumed, ethnicity, gender, health, other drugs consumed and emotional state will contribute to the difference in effects.

Did you know?

- Women are more sensitive or susceptible to organ and tissue damage from the alcohol contained in wine than men.
- There are certain characteristic effects on the body that occur as the blood alcohol concentration increases. The alcohol contained in wine affects the following organs and tissues: brain and central nervous system, heart, immune system, stomach and small intestine, liver, kidneys and pancreas.

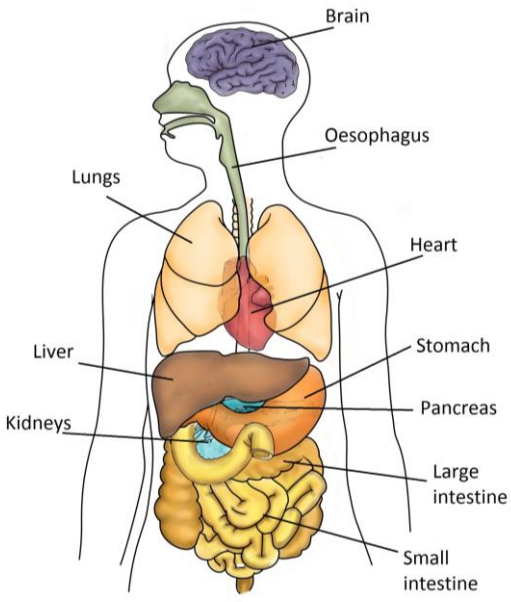

Figure. The organs and tissues that can be affected by alcohol circulating in the blood stream.

Effects of the alcohol contained in wine

Brain and central nervous system

Generally, the effects of alcohol on the brain and central nervous system are proportional to the blood alcohol concentration.

When the concentration of alcohol in the cerebro-spinal fluid surrounding the grey matter is relatively low, the brain cells of the central nervous system become temporarily disconnected or unplugged, and do not transmit every electrical message. The messages that are transmitted, therefore, become uncoordinated. The first brain cells to be disconnected are the cells that control thinking and worrying, so that inhibitions can be lessened or lost. Second, are the cells that control our five senses, such as sight and speech.

As the alcohol diffuses through the brain, it affects the brain cells and tissues controlling coordination and emotion, such as anger, happiness and sadness. It can also disconnect the brain cells which connect the right to the left side of the brain, so that sight becomes blurred, speech slurred and a person's personality changes quickly; for example, from angry to laughing to crying and back to angry.

If the concentration of alcohol is high, when alcohol reaches the brain stem, it disconnects brain cells, which shut down the automatic nervous system. For example, the sleep centre is affected so that consciousness is lost. When the concentration of alcohol is excessive (BAC>0.3), the automatic functions of breathing and heart beating are affected and can switch off, and death occurs. Furthermore, when the concentration of alcohol in the brain is high or excessive, the brain cells die and are not necessarily replaced by new cells.

Cardiovascular system (heart and lungs)

Alcohol acts directly on blood vessels and the heart. Alcohol also acts indirectly on blood vessels and the heart via the brain. The actions and effects are also dependent on the amount of alcohol consumed.

When you drink a low to moderate amount of alcohol, the blood vessels relax and blood flow is increased though the skin and tissues. Your blood pressure is reduced but your heart rate is increased to pump the blood and maintain blood flow to the organs.

Low to moderate amounts of alcohol also increase the concentration of the good cholesterol in the blood and increase the production of anti-blood clotting chemicals in the blood, which reduces the risk of a heart attack or stroke.

When you drink excessive amounts of alcohol your blood pressure conversely increases. Over a prolonged period of time, excessive drinking can result in high blood pressure, heart disease and heart failure. High blood pressure increases the risk of a heart attack or a stroke. Binge drinking excessive amounts can result in an irregular heart beat which increases the risk of sudden death.

Immune system

The immune system is a network of specialised cells and tissues which defend the body against foreign compounds such as viruses, bacteria and parasites, which can cause an infection and can be associated with infectious diseases.

Prolonged excessive alcohol drinking suppresses the immune system and acts to decrease resistance to infections and infectious diseases.

Stomach and small intestine

Alcohol irritates the lining of the stomach and small intestine by stimulating the production of acid. Acid is necessary to breakdown and digest foods, but excessive acid from prolonged excessive alcohol drinking breaks down the lining. Sores and then ulcers can develop in the lining and, if untreated by drugs which suppress the production of acid, the ulcers can bleed and may increase the risk of stomach and intestinal cancer.

Alcohol can also damage the cells lining the stomach and intestines, which can block the absorption and breakdown of nutrients in those organs.

Liver

Prolonged excessive alcohol drinking initially causes fat deposits to develop in the liver. The liver may become inflamed resulting in alcoholic hepatitis which can result in liver failure and death. Prolonged excessive alcohol drinking can also permanently scar and damage the liver resulting in liver cirrhosis. Liver cirrhosis is a build-up of scar tissue which changes the structure of the liver and blocks blood flow and increases the risk of liver cancer.

Kidneys

Alcohol inhibits the secretion of an anti-diuretic hormone from the pituitary gland, which regulates the re-absorption of water in the kidneys. Without this anti-diuretic hormone, water is minimally reabsorbed back into the blood from urine, and the volume of urine is increased. This is why you urinate (and feel that you need to) more when drinking alcohol and also why you feel dehydrated after drinking alcohol.

Pancreas

Continuous excessive alcohol drinking causes pancreatitis, where the cells of the pancreas leak digestive enzymes into the pancreas tissue, such that the pancreas tissue begins to digest itself and the pancreas cannot function.

Did you know?

- Drinking wine is also a source of dietary calories but is not a primary cause of obesity. A 100 mL glass of red or white wine contains approximately 68 calories or 283 kilojoules.
- Drinking wine also increases the risk of cancer in the liver, pancreas, rectum, breast, mouth, pharynx, larynx and oesophagus.

Contact

For further information, please contact:

Dr Creina Stockley

Phone 08 8313 6600 **Fax** 08 8313 6601

Email helpdesk@awri.com.au

Website http://www.awri.com.au

Address Wine Innovation Central Building, Corner of Hartley Grove & Paratoo Rd, Urrbrae (Adelaide), SA 5064