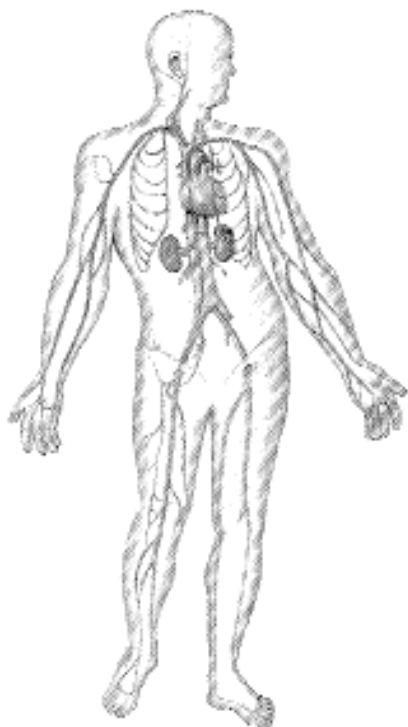


Smoking & cardiovascular disease

Most people are aware that smoking causes lung cancer. But did you know that cardiovascular diseases also claim the lives of many smokers? Cardiovascular disease includes any damage to, or disease of, the heart, arteries, veins and smaller blood vessels. Also included in this sheet is information about **diabetes**, smoking and **blindness**, and smoking and **wound healing**.

How smoking affects the cardiovascular system

Whenever a person smokes a cigarette, the chemicals in the smoke, particularly nicotine and carbon monoxide, damage the cardiovascular system.



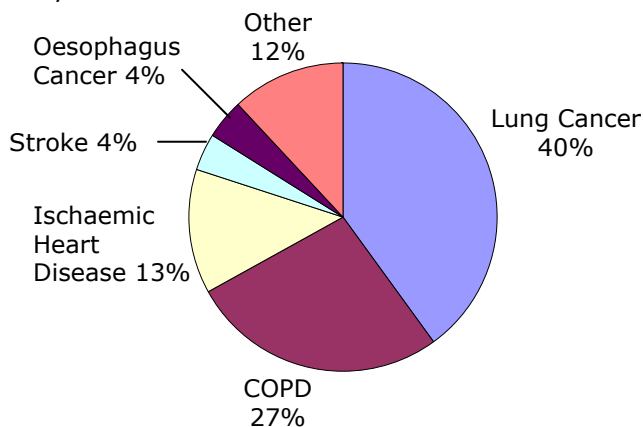
- Nicotine causes both immediate and longer term increases in blood pressure, heart rate, cardiac output and coronary blood flow.
- Carbon monoxide binds to the haemoglobin, which is what normally carries oxygen from the lungs via the bloodstream, and therefore reduces the amount of oxygen reaching body tissues.
- Smoking also makes blood vessels and blood cells sticky, allowing cholesterol and other dangerous fatty material to build up inside them. This is called **atherosclerosis**.¹ This in turn can lead to raised blood pressure and clot formation.

Research has confirmed that smoking damages the blood vessels.² A study looked at the arteries of people aged 15 - 34 who had died from accident, suicide or murder and looked for evidence of fatty build up in blood vessels, and measured levels of cholesterol and thiocyanate, a marker for cigarette smoking. They found that any person who had smoked showed more early signs of atherosclerosis than people who had never smoked. In some cases, material could be squeezed from the arteries like toothpaste.

As well, passive smoking has been identified as a contributor to cardiovascular disease.³

Cardiovascular diseases linked with smoking

There are a number of cardiovascular diseases that are associated with smoking. They include **heart disease**, **stroke** and **peripheral vascular disease**. It is estimated that around 13% of cardiovascular disease deaths are due to smoking. The graph below shows that over 1/5 of deaths due to smoking-related illness are caused by heart disease.



Proportion of deaths attributable to smoking by disease: 2003. In 2003, the estimated total number of deaths attributable to smoking was 15,511⁹

Coronary heart disease (CHD)

Coronary heart disease (mainly heart attack) is the most common cause of sudden death in Australia. It is the largest single cause of death for men and women, with 26,063 deaths in 2002 (20% of all deaths).⁴

Smoking is one of the major risk factors for heart attack. The risk of developing CHD increases with length and intensity of exposure to cigarette smoke. Among people less than 65 years of age, it is estimated that 36% of CHD in men and 33% in women is attributable to cigarette smoking. In all cases, risk increases with increased consumption.⁵ These proportions do not include deaths from atherosclerosis or other heart disease.

Stroke

Strokes occur because of damage to the brain due to one of two things - either the blood supply to the brain is blocked or blood has escaped into the brain. These can happen because of atherosclerosis or high blood pressure.

Smoking may cause an artery in the brain to become blocked by a blood clot or other debris carried in the bloodstream. This cuts off the blood supply to the surrounding brain cells and causes them to die. This can affect thinking, movement, speech and/or the senses. About a third of those who have a stroke die within 12 months. Another third become permanently disabled. About 40,000 Australians have a stroke each year.

Smokers have at least double the risk of having a stroke as a person who has never smoked. The longer a person has smoked, and the more cigarettes per day they smoke, the greater their risk of stroke.

While strokes are more common in older people, people in their 20s and 30s die from strokes too. The influence of smoking is most apparent in younger age groups. Among people less than 65 years old, it is estimated that cigarette smoking causes 44% of strokes in men and 39% in women.⁷

Peripheral Vascular Disease

This type of cardiovascular disease occurs mainly in older people. It is a narrowing of the arteries in the extremities caused by blocked arteries which reduces blood circulation. Mostly, this occurs in the legs and feet, but can also occur in the arms and hands.

The main outcome of peripheral vascular disease is pain while walking and resting. Sometimes the blood supply is so reduced that amputation is necessary to prevent gangrene.¹

Nine out of ten people with this disease are smokers. Immediately stopping smoking is the most important treatment for this disease.¹

Cardiovascular disease (CVD) risk factors

Tobacco smoking is estimated to be the risk factor responsible for the greatest burden of disease in Australia, and is one of the main risk factors for cardiovascular disease. Other lifestyle (behavioural), physiological and genetic risk factors for cardiovascular disease include

- High blood pressure
- High blood cholesterol
- Poor nutrition - eg high alcohol, fat consumption
- Low levels of physical activity
- Overweight and obesity
- Diabetes
- Family history of heart disease

As well, men are more likely than women to have CVD, and risk increases with age. Most people have a combination of factors, which greatly increases the likelihood of illness and death due to cardiovascular disease.²

Prevention and risk reduction

As with most smoking related diseases, there would be less cardiovascular disease in Australia if no one smoked.

There are also real benefits of stopping smoking. In the case of Coronary Heart Disease, the risk of death is approximately halved one year after

stopping, and after 15 years, is similar to that of those who have never smoked.⁷

Non-smokers with cardiovascular disease have a better prognosis than smokers - their treatments are more effective, and last longer.

Diabetes

Diabetes is a significant cause of illness and disease in the Australian population. In 1999-2000, around 7.6% of the population were known to be affected by it. Diabetes occurs when the body is not able to adequately control blood sugar levels. There are three main forms - Type 1 (occurring in people <30 years), Type 2 (more common in older age groups) and gestational diabetes (during pregnancy).⁴

People with diabetes are at risk of developing a number of other diseases. These include cardiovascular diseases; kidney disease (nephrothapy); eye disease leading to blindness (retinopathy); peripheral neuropathy (nerve damage) and impotence.

Smoking and diabetes

Recent research has suggested that smoking may be a risk factor for Type 2 diabetes. Smokers with diabetes will find it harder to prevent many of the serious problems caused by their diabetes.

- Diabetes can cause blood flow problems in the legs and feet, which can lead to amputations (loss of limbs). Smoking decreases blood flow even more.
- Diabetes can cause sexual impotence in men. Smoking can make it worse.
- Diabetes can cause high levels of LDL or "bad" cholesterol, which can lead to hardened arteries. Smoking also damages blood vessels.
- Heart disease is the major cause of death among people with diabetes. Smoking makes the risk of heart attack even greater.

Joint and nerve problems and gum disease are also worse in diabetes sufferers who smoke.

Benefits of quitting

Smokers with diabetes have much to gain from quitting. Becoming a non-smoker reduces their risk of a whole range of diseases that are complications of diabetes, and will significantly increase well-being and quality of life.

Smoking and blindness

Age-related macular degeneration (AMD) is the leading cause of blindness in Australia, and a number of studies have shown that smoking is a risk factor for this disease. These studies have shown that smokers are two to five times more likely to develop AMD than non-smokers. Smokers over the age of 50 are particularly at risk.

Although not a vascular disease, AMD causes blindness when blood vessels in the eye burst. It is thought that chemicals in tobacco smoke damage the macula (the most sensitive part of the retina, at the back of the eye). Tiny blood vessels can burst through the macula, leading to irreversible damage, or alternatively, the cells of the macula slowly die. Both eventually lead to loss of vision. There is currently no treatment for blindness due to AMD, and many people are unaware of the condition until the sight in their second eye starts to fail.

Prevention and risk reduction

Never smoking significantly reduces the risk of getting AMD. Quitting smoking does not reverse damage already done, but will stop further damage from occurring.

Smoking and wound healing

Both active smoking and exposure to passive smoke may cause problems with wound healing.

Good blood flow helps injuries and surgical wounds heal quickly. As smoking affects blood circulation, especially to the extremities, smokers' wounds often take longer to heal and complications are more common. This is of paramount importance to burns victims, and those recovering from surgery.

Smokers having cosmetic or reconstructive surgery (eg face lifts, breast reconstruction) are particularly at risk of poor surgical outcomes as a result of their smoking. Some surgeons may refuse to perform elective surgery on smokers who will not quit prior to surgery, due to the increased risk of complications, and the reduced benefit of some surgery to smokers.

Smokers are also at increased risk of infection following surgery, and are at greater risk for complications during and after anaesthesia.

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JANUARY 2008