

The health effects of **SMOKING**

Many years of research

Over 57,000 reports have examined the connection between cigarette smoking and disease:¹ in fact one major review has stated that 'It is safe to say that smoking represents the most extensively documented cause of disease ever investigated in the history of biomedical research'.²

The effects of smoking have been observed for a very long time. As early as the 1820s, research identified nicotine in tobacco as being extremely poisonous, and tobacco use was linked with a variety of illnesses.³ During the 1920s and 1930s, increases in the number of patients with lung cancer were recorded by hospital staff.^{4,5} Medical research finally found a clear link between smoking and lung cancer in 1950,^{6,7} and in the years since then, smoking has been linked with a number of other diseases that can cause many years of illness, and death. This TAP unit looks at the range of health problems caused by smoking.

What does smoking do to us?

If you smoke, or are around smokers, you will probably notice a number of things – like the smell of smoke on the breath, hair and clothes. The irritating chemicals in tobacco smoke can make your eyes water, and make you want to cough.

Just smoking one cigarette has an immediate effect on the body. Although a smoker might feel relaxed while having a cigarette, the nicotine in cigarettes actually increases heart rate and makes the blood pressure rise. Nicotine also tightens the blood vessels. This slows down blood flow to the skin, and skin temperature drops. Nicotine also stimulates, then reduces, brain activity, and affects food digestion.² People new to smoking often feel sick when they smoke. Their bodies are responding to the effect of nicotine, a strong poison.

Added to this, the carbon monoxide breathed in with cigarette smoke enters the blood stream, taking the place of vital oxygen needed by the muscles and organs.⁸ This means that the body is not able to perform at its best.

Chemicals in tobacco smoke harm the airways and lungs, damaging the lungs' self-cleaning system, and making the smoker more open to coughs and chest infections.⁹ Teenage smokers cough more than teenagers who don't smoke, and by the time they become adults, many young smokers will already have abnormal changes in the cells lining their small airways.⁹ Teenage smokers also have more asthma and allergic symptoms than non-smokers of the same age,¹⁰ and get more puffed out when exercising.¹¹

As you can see, many parts of the body are affected by smoking. Just one cigarette makes a difference, and even young smokers can show signs of damage due to smoking. Smoking can also make people who breathe in other people's smoke, sick. This is called passive smoking. You can find out more about passive smoking by reading Tobacco Action Pack: Passive Smoking.

Smoking and disease

When people become regular users of tobacco, they can find it very difficult to stop. Starting smoking when young, and smoking for a long time, makes it more likely that a smoking-caused disease will develop.^{8,9,12} Around one in two smokers will die of a tobacco-caused illness.¹³

Smoking leads to a wide range of diseases, including heart disease and stroke, a number of different kinds of cancer, and chest and lung illnesses. Stomach ulcers are caused by smoking. Smoking also affects the unborn baby, and fertility of males and females.

Smoking, heart disease and blood vessel disease

Cigarette smoking is a major cause of heart disease and blood vessel disease. Smoking affects the working of the body's blood supply in a number of ways. It makes the arteries (important blood transport vessels) narrow and sticky, causing a build up of dangerous fatty deposits. This damage starts so early that if an autopsy were performed on the main artery of the heart (the aorta) of a smoker as young as 15 years old, a doctor could tell if he or she smoked by the amount of fatty material there. If the aorta was squeezed, fatty material would ooze out like toothpaste.⁵⁴ Smoking also raises blood pressure, and makes the heart work harder. The carbon monoxide in smoke deprives the body of oxygen. Acting together, these things can cause death, or permanent disability. Narrow arteries may burst under pressure of the blood trying to get through. This is called an aneurysm, and is life-threatening. Blockages in the blood supply around the heart lead to a heart attack. A blockage to the brain causes a stroke, which may cause death or disability, depending on the part of the brain affected. If the blockage to blood supply occurs in the arms or legs, severe pain will result, and the body part may need to be amputated. This type of blood vessel disease is called peripheral vascular disease.^{8,14}

Other important causes of heart disease that people can avoid are having high blood fat levels, high blood pressure and being overweight. If you smoke as well as have any of these other risk factors, then you have a much greater risk of developing heart disease.¹⁴

Around one quarter of Australian men and women die from heart disease.¹⁶

Smoking and cancer

Long-term exposure to the chemicals in cigarette smoke can lead to cancer in different parts of the body. Smoke contains 43 different chemicals known to cause cancer.¹ Certain chemicals damage an important gene called p53. The p53 gene is found in the nucleus of every cell in the human body, and its main role is to prevent cancer cells evolving. Cigarette smoke is the main cause of p53 mutations in lung cancer.¹⁷

Lung cancer is the most common form of cancer caused by smoking. It can take many years to develop, and almost always leads to death.^{12,18} Most people who die from lung cancer are smokers.¹⁹ Lung cancer is the most common cause of death from cancer in Australian men.²⁰

Smoking also causes cancer of the lips, tongue, mouth, throat, air pipe and pancreas and is linked with cancers of the stomach, bladder, cervix, and kidney.^{1,12,19} It is estimated that smoking causes around a third of all cancer deaths in Australia.²⁰

Smoking and the lungs

Our body's ability to filter the air we breathe is affected by smoking.

When we breathe in, the lungs stretch to let air fill all their tiny air sacs (called alveoli). Oxygen passes through the alveoli wall to the blood. Carbon dioxide leaves the blood as we breathe out. A smoker's lungs also fill with gases from tobacco smoke, so other gases and chemicals enter the bloodstream as well.

The airways are lined with tiny hairs called cilia. Cilia help filter out dust and other particles we breathe in. Chemicals in tobacco smoke, especially hydrogen cyanide, ammonia and formaldehyde have a harmful effect on the cilia.¹² When the cilia are unable to clean the airways, there is a build up of mucus and poisons that can lead to damage and disease.⁹

The lungs and airways respond to the damage caused by tobacco smoke by making more mucus and phlegm, which makes the smoker need to cough. This is sometimes called smoker's cough. Smokers are also more likely to get infections in the lungs and airways due to the extra mucus secretions. This is called chronic bronchitis.

The lungs and airways eventually become so damaged that they lose their ability to stretch, and become hard and narrowed. This makes breathing more difficult and reduces the ability of the lungs to work properly.

Emphysema

Emphysema is damage to the small airways within the lungs. The elastic walls around the air sacs are permanently destroyed, and are unable to contract and expand. This makes areas of the lungs unable to work properly.

Some degree of emphysema is found in almost all people who smoke more than 20 cigarettes per day.⁹

Smoking and fitness

Smoking raises the heart rate and blood pressure, and reduces the amount of oxygen in the blood. Chemicals in the smoke also irritate the airways, and make them narrower. These immediate effects make it more difficult for the body to work at its best level. The carbon monoxide in the blood can also affect eyesight, especially at night, response time, and co-ordination.^{21,22}

Even after one day of not smoking, more oxygen is available to the blood, and physical performance improves.²³

Smoking and women

As well as the diseases and health problems outlined above, women who smoke face extra problems.

Smokers are more likely to have irregular periods,²⁴ and to reach menopause earlier.²⁵ They also have a greater risk of developing cancer of the cervix.²⁶ Smoking has also been linked with the development of osteoporosis (fragile bones).²⁵

Women who smoke and use the contraceptive pill have a greater risk of heart attack, stroke and other cardiovascular diseases than non smokers who use the pill. This risk increases with the number of cigarettes smoked per day and with age.⁵⁰ Smoking is also a problem for women who would like to get pregnant, as research has shown that smoking reduces fertility.^{24,27,28}

Smoking and men

Male fertility is also affected by smoking. Studies have shown that smokers produce less sperm and have more abnormal sperm than non-smokers.²⁴ Smokers are also more likely to have difficulty getting an erection, due to problems with blood supply to the penis.^{29, 30, 31}

Smoking and parenting

Parents who smoke affect not only their own health, but the health of their children, even before they are born.

Smoking while pregnant causes problems for the mother and the baby. Nicotine and other poisons in cigarette smoke reach the baby through the mother's bloodstream.²⁵ The mother is more likely to have a miscarriage, and complications with the pregnancy and the birth. Babies of smokers are, on average, 200 grams lighter than the babies of non-smokers, and twice as likely to be of low birthweight. They are also more likely to be born early, and to die around the time of birth. The effects of smoking on the child's growth and development may continue over many years.²⁴ Even if a pregnant woman breathes in someone else's cigarette smoke, the unborn baby can be affected.^{32,33,34}

Smoking during pregnancy and after the birth is considered one of the major risk factors for sudden infant death syndrome (SIDS or cot death).^{35,36,37} Children of smokers are also more likely to have asthma and problems with their lungs.³⁸

Tobacco Action Pack: Passive Smoking has more information about the ways that children's health can be affected by people smoking around them.

Other effects of smoking

Smoking also causes a number of other problems. Smokers are more likely to develop stomach ulcers than non-smokers, and ulcers take longer to heal in smokers.¹ Smoking is also known to affect the body's immune system, which is the way the body protects itself against infection and disease.⁹ Smokers who have operations are more likely to have problems with the surgery and recovery, due to the effects of smoking on the heart, blood circulation and oxygen supply.³⁹

Smokers have a poorer sense of smell than non-smokers,⁴⁰ are more likely to snore,⁴¹ and to have wrinkles around the eyes and mouth. Smoking also affects the colour of the complexion.^{42,43,44}

Cigarettes and lighters themselves also cause injury and even death. Hospital records show that children have been accidentally burnt by other people's cigarettes, and lighters and lighter fluid are also a cause of burns.⁴⁵ Around one in four deaths caused by fires is due to fires started by cigarettes.¹⁹

Low tar does not mean low risk

Due to health concerns about tobacco, the companies that make cigarettes have changed their products to reduce the amounts of tar, nicotine and carbon monoxide that can be detected. There is evidence that the lower-tar brands with filter tips manufactured in the 1960s and 70s caused less lung cancer than the much higher-tar brands smoked in the 1940s and 50s. However there is no evidence that they reduced heart and other lung disease, problems in pregnancy,⁴⁶ and other cancers.⁴⁷

Australian tobacco companies had made an agreement with the Federal Government that the cigarettes they manufacture should not deliver more than the set levels for each of these chemicals (see Tobacco Action Pack: What's in Cigarettes), but are these cigarettes safer? Evidence so far suggests that smokers of lower tar cigarettes may have a slightly reduced risk of lung cancer, but have the same risk of heart disease and stroke, and possibly diseases of the lung, as smokers of regular cigarettes.⁵¹

The amount of tar, nicotine and carbon monoxide actually inhaled by the smokers might be very different to the levels measured by testing equipment. One study measuring the intake of nicotine and tar of smokers of low and medium tar brands found that because these smokers took larger puffs at shorter intervals than the testing machine, they received about twice as much nicotine and tar than was stated on the packs.⁵² Some cigarettes reduce tar and nicotine yields by a system of air dilution holes in the filter, however these may be blocked by the lips and fingers of the smoker, and so increase how much smoke they inhale.⁵³

There is no safe cigarette, and no safe level of smoking.⁴⁶

The final blow

All this adds up to a great deal of sickness and death. Tobacco causes thousands of deaths each year. Smoking kills over four times more people in Australia than alcohol and all other drugs combined.¹⁹ Nine times more people die from smoking each year than from car accidents.⁴⁸

The following table shows the numbers of Australian men and women estimated to have died from smoking-caused illness in one year.

Table 1 Estimated deaths caused by active smoking of tobacco in Australia in 1992, by disease

Condition	Male Deaths	Female Deaths
Cancers		
Lip and mouth	207	47
Oesophagus	277	76
Stomach	89	28
Pancreas	139	78
Larynx	163	14
Lung	3,916	1,147
Cervix	–	48
Bladder	193	45
Kidney	124	49
Heart disease	3,185	1,105
Stroke	859	525
Atherosclerosis	691	283
Pneumonia	174	70
Chronic bronchitis	3,185	1,252
Peptic ulcer	159	80
Low birth-weight	52	40
Sudden infant death syndrome	63	41
Fires	19	12
Other diseases	362	123
Total caused by smoking	13,857	5,063
Total all Australians	18,920	

Source: English et al.¹⁹

It has been estimated that during 1997, almost 18,224 Australians died from smoking-related diseases.⁴⁹ In 1997, Victorians would have made up roughly 4,550 of these fatalities. This means that around 12 people in Victoria died each day from smoking.

The Effects of Smoking – Activities

- 1 Find out how much people know about the health effects of smoking. Conduct a survey including students, teachers, parents and other people you know. Which group of people you spoke to had the most/least knowledge about smoking?
- 2 From your survey decide what information is most needed and develop a plan to provide people with this information.
- 3 Interview some sports people to find out their views on smoking and sports performance. Choose a range of sports. Write a report on your findings.
- 4 Design posters which can be used to inform people about the health effects of smoking (eg. How would a company advertise the truth about cigarettes?).
- 5 Examine health insurance conditions which apply to smokers. Find out what the cost differences are for smokers intending to take out life insurance, compared to non-smokers. Why would this be?

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100 Drummond Street, Carlton, Victoria. PO Box 888 Carlton, Victoria 3053 Australia
Telephone: (03) 9663 7777 Fax: (03) 9635 5510 (International: +61 3 9635 5510) Internet: www.quit.org.au

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