

# Inside story: the body

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**Want to know more about what happens when you:**

**Have a cigarette?**



This resource booklet gives you all this info and more!

**Be creative – make a PowerPoint presentation**

Use the information (including the gory photographs) to construct a profile of '*somebody*' who smokes. Choose your own '*somebody*' from the pictures on slide one, or you may be able to scan in a photo of your own. Choose information from this booklet. Create new slides in the PowerPoint presentation. Type in the information you have chosen or found out from other places. Change the order of the slides to create your own presentation.

**Why not prepare a presentation for:**

- **Your friends**
- **Members of your family**

Find out **unusual scientific facts** about tobacco!

Look at some **gory photos**- never seen before in schools!

**Discover** what tobacco does to '*somebody*' – your body!

## **Drugs are chemicals that affect how the body functions**

Solvents are useful chemicals which some people abuse. Alcohol and nicotine (tobacco) are both legal drugs. They are responsible for huge numbers of deaths and illness all over the world – and heavy drinking is often associated with heavy smoking. Here we delve into the cells, tissues and organs of 'somebody' to find out how what effect these chemicals have. The effects differ in many ways, mainly because the chemicals enter the body by different routes.

The information is organised in the following way.

### **Smoking**

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### **1. Brain, nervous system and behaviour**

Smoking affects your sense of taste and smell. People who stop smoking say they can smell and taste much more.

The sensory cells which help 'somebody' taste and smell are on the tongue, in the mouth and in the nose.

Nicotine and smoke act on the brain, causing nausea, vomiting and drowsiness (especially in the early days of smoking).

Smoking is highly addictive.

A report by the Royal College of Physicians suggests that nicotine is as addictive as heroin or cocaine.

Nicotine is an addictive drug, but it does not interfere too much with behaviour.

For people who are regular smokers nicotine relieves stress and anxiety, reduces frustration, anger and aggressive feelings and makes them feel more relaxed.

## 2. Respiratory system

Cigarette smoke enters the body by means of the respiratory (breathing) system. It is not surprising that it affects this system the most.

Nicotine (the main drug in cigarette smoke) is an irritant. If it is used as snuff it causes violent sneezing and loads of mucus.

If nicotine is smoked it irritates all the linings of breathing system.

If tobacco is chewed it increases the flow of saliva. This is because it irritates the lining of the mouth.

Many of the air passages in the breathing system are lined with tiny hairs called cilia. Tobacco smoke paralyses these cilia.

- Cilia lining the 'bronchial tubes' (breathing tubes) are there to clear the airways of rubbish breathed in (e.g. dust, bacteria and even flies!)
- If the cilia cannot work or are damaged the bronchial tubes become clogged up with mucus and dirt.
- Blocked bronchial tubes make breathing difficult.
- Blocked bronchial tubes are more likely to become infected. The phlegm then becomes green and smelly.
- Smoking gives *'somebody'* a 'smoker's cough' and they cough up more phlegm.

### Lung problems

Lung cancer kills more than 20,000 people in the UK every year.

Men who smoke increase their chances of dying from the disease by more than 22 times.

Women who smoke increase their risk by nearly 12 times.

Lung cancer is a difficult cancer to treat - most people who get it die from it. Cells in the body are always dividing to replace cells that become old and die. When this process gets out of control the cells continue to grow and make a cancerous tumour. Tobacco smoke contains chemicals that cause the cells to divide and grow into tumours (cancer).



**Photo 29** Tumours often start in the bronchi and then the cancer spreads down these air tubes into the lungs where the cancer develops further.



**Photos 23 and 24** show cancerous cells developing in the bronchi.

Another health problem associated with tobacco is **chronic obstructive pulmonary disease** (COPD). This is a very technical medical term used to describe a blocking up of the breathing system. Two diseases, emphysema and bronchitis, make up COPD.

**Emphysema** means full of air. Coughing due to dirt and phlegm in the breathing system splits the tiny delicate air sacs in the lungs. This reduces the surface area for gas exchange so makes breathing harder. Also the air sacs lose their elasticity and so cannot get rid of the air so easily. If *'somebody'* has emphysema they have to really work hard to breathe out. Their lungs are always full of air. The size of their chest cage increases so they have a huge chest!

Good news! COPD is serious and deadly but is avoidable. Don't smoke!



**Photo 26** The centre of this lung tissue has damaged air sacs. There are huge spaces. There are also black spots from the smoke. This lung damage that causes emphysema is irreversible. It makes breathing extremely difficult. If you can't breathe what else can't you do? Almost everything!!!!



**Photos 25, 27 and 28** show blackened lungs due to smoking.

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### 3. Circulatory system

Nicotine stimulates the heart, causing it to speed up and to beat in an irregular way. Biologically it does not calm you down even though some smokers feel relaxed when they have a cigarette.

It also causes blood vessels to get narrower. This slows down the blood flow. Not only does this stop blood reaching the parts of the body it needs to reach, but it also increases blood pressure.

Smoking damages most blood vessels but particularly those in the legs and arms. This may lead to amputation of toes, fingers, arms or legs. The first symptoms are poor circulation of blood to the extremities, e.g. feet and hands. They turn blue.



**Photo 30** '*Somebody*' has 'Peripheral cyanosis' (cyan means blue), which is caused by poor blood flow to the extremities – in this case the feet. It occurs in conditions such as heart failure, shock and exposure to cold environments but it also occurs commonly in smokers. If the situation does not improve for '*somebody*' then he will have to have both legs amputated.

**Photo 31** '*Somebody*' has peripheral vascular disease and has a blood clot in the vein of one of his fingers (right ring finger). This is slightly bluer than the other fingers. '*Somebody*' is clearly a heavy smoker which makes him more likely to develop this condition. You can see yellowing of the fingers due to nicotine staining.

Once the blood supply is cut off from extremities, the cells die due to lack of oxygen and turn black. This dead tissue must be removed by amputation. About 2000 amputations caused by smoking are carried out each year in UK.

**Photo 33** '*Somebody*' who has had fingers amputated.

**Photo 32** Feet damaged by poor circulation. These toes will have to be amputated.

**Photos 39 and 40** Another sign of circulation disease is that the ends of bones become wider, especially the fingers and toes. It is seen in people with chronic breathing problems and heart failure so is quite common in heavy smokers.

The rise in blood pressure can lead to heart attacks (rather like with alcohol abuse). If '*somebody*' stops smoking then the risk of heart attack reduces. The risk of heart attack falls to about half of that for '*somebody*' who has never smoked if they stop for 5 years. The risk falls to the same as a never-smoker after 10 years.

'*Somebody*' (male) who smokes with high blood pressure is 26 times more likely to be impotent (unable to have sexual intercourse).

As well as nicotine cigarette smoke also contains carbon monoxide, a poisonous gas. It combines with haemoglobin in the red blood cells. Normally haemoglobin carries oxygen around the body. Carbon monoxide attaches to haemoglobin so it cannot carry as much oxygen.

Too much carbon monoxide and you will die. Signs of carbon monoxide poisoning are stiff neck, nausea, pink cheeks and eventually, unconsciousness and death.

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## 4. Cancers

Cells in the body are always dividing to replace cells that become old and die. When this process gets out of control the cells continue to grow and make a cancerous tumour.

Tobacco smoke contains chemicals that cause the cells to divide and grow into tumours (cancer). These substances are easily carried around the body so a lot of cancers are linked to smoking. Cancer is a collective term for a range of diseases and is a leading cause of death worldwide.

Smoking is a risk factor for many cancers, not just lung cancer.



- **Photo 44** cancer of the bladder
- **Photo 42** cancer of the kidney
- cancer of the larynx
- **Photo 29** cancer of the lung
- cancer of the mouth
- cancer of the nose
- **Photo 41** cancer of the oesophagus
- **Photo 45** cancer of the pancreas
- cancer of the stomach
- cancer of the throat

Does *'somebody'* have any of these cancers?

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## 5. Are there genes for addiction?

Just like alcohol abuse it is thought that there are genes which make you more likely to become addicted to smoking.

Use **Photo 1** if *'somebody'* has these addictive genes. It is a chromosome map of a female (XX). Somewhere on these chromosomes are genes that make *'somebody'* more likely to become addicted to nicotine. You can only use this photo if your *'somebody'* is female.

Tobacco smoking may have an effect on the mutation rate in a gene called p53.

p53 is thought to be a gene that stops cancerous tumours developing. If this gene is changed (mutated) then tumours can develop. Look at the list of cancers linked with smoking.

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## 6. Facts and statistics

1% of the weight of a tobacco leaf is nicotine. If all the nicotine in a **single** cigarette was absorbed into the body it would be very toxic - even lethal.

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Smokers look older than non-smokers – true. Smokers have more wrinkles than non-smokers of the same age. This may be due to blood vessels going to the skin getting narrower because of nicotine.

First experiences of nicotine are unpleasant. They are nausea, heart palpitations, weakness and even fainting. The body soon becomes tolerant of these toxic effects.

About 450 children in the UK start smoking every day.

Smoking kills more than 120,000 people in Britain every year.

Worldwide, a tobacco related death occurs every eight seconds. Look round the lab. One person every eight seconds. That works out at a class of 30 every 4 minutes.

Worldwide an estimated 3 million people died from tobacco-related diseases in 1990.

It is estimated that 8.4 million people will die from tobacco-related diseases each year by the year 2020.

One person dies every 15 minutes from lung cancer.

Tobacco smoking causes 8 out of 10 cases of lung cancer.

Lung cancer is a very serious disease. Fewer than 10% of lung cancer patients survive five years after they've been found to have it.

Approximately 33% of all cancer deaths in the UK (over 50,000) are caused by tobacco.

Smoking damages blood vessels, especially those in the legs. This may lead to amputation of one or both legs.

About 2000 amputations caused by smoking are carried out each year in UK.

It takes 20 minutes after smoking a cigarette for your blood pressure and pulse rate to return to normal.

It takes 8 hours for your blood oxygen levels to return to normal after smoking.

50 % of the nicotine and carbon monoxide taken in to your body when you smoke is still present in your blood 8 hours after smoking.

It takes up to 24 hours, after stopping smoking, to get rid of all carbon monoxide from the body

There is no nicotine left in the body after 24 hours of not smoking.

If you stop smoking for 5 years the risk of heart attack falls to about half of that of someone who has never smoked. If you don't smoke for 10 years the risk falls to the same as a never-smoker.

Smoking may ruin your sex-life. Men with high blood pressure who smoke are 26 times more likely to be impotent than non-smokers (unable to have sexual intercourse).

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## **7. History of smoking**

Examples of statements from:

<http://www.ash.org.uk/html/schools/keydates.html>

600 - 1000 AD Artwork on Guatemalan pottery shows tobacco being smoked.

1572 Sir Francis Drake brings 'pipe smoking' to Britain from the Americas.

1908 Children's Act bans sale of tobacco to Under 16s.

1930s Britain has the highest lung cancer rate in the world.

1933 Section 7 of the Children and Young Persons Act made the sale of cigarettes to Under 16s illegal.

1951 Findings of a study of the relationship between smoking and lung cancer in 5000 patients in British hospitals was carried out by Doll and Hill and published in the British Medical Journal. 99.5% of the 1357 men with lung cancer were smokers.

1964 Doll and Hill published results of a survey of British doctors. Results showed that the chance of lung cancer decreased in those who gave up smoking compared to those who did not.

1971 Cigarette packs carry Government Health Warnings.

1975 Tar Groupings to be printed on packs.

1987 London Underground bans smoking and tobacco advertising.

1987 British Airways bans smoking on domestic flights.

1992 Nicotine patches available on prescription in UK.

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## **8. Smoking around the world.**

50% of children in England live in households with at least one smoker.

Currently only 28% of adult men and 26% of adult women in the UK are smokers.

In the UK smoking is highest in the age group 20 - 24. The figures in this group are 42% of men and 39% of women.

In 1999 lung cancer overtook breast cancer as the main cause of cancer deaths in women in the UK.

In the UK in 1999, 9% of children aged 11-15 smoked cigarettes regularly.

<b>Age 15</b> <b>Country</b>	<b>% smoking regularly</b>	
	<b>Boys</b>	<b>Girls</b>
England	25	33
N.Ireland	20	28
Scotland	22	28
Wales	22	29
USA	20	21

<b>Age 13</b> <b>Country</b>	<b>Boys</b>	<b>Girls</b>
	England	11
N.Ireland	12	15
Scotland	9	13
Wales	8	18
USA	8	9

<b>Age 11</b> <b>Country</b>	<b>Boys</b>	<b>Girls</b>
	England	3
N.Ireland	3	2
Scotland	2	3
Wales	2	2
USA	3	2

### **The role of tobacco in the economies of tobacco growing countries**

Some developing countries rely on the income from growing and selling tobacco.

Tobacco as a cash crop is replacing food crops in some parts of the developing world.

66% of the developing countries that export tobacco spend more on cigarette imports than they earn from their tobacco export.

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## **9. Media messages designed to promote or reduce smoking.**

Tobacco advertising and sports sponsorship are used to persuade people to smoke. They project a very glamorous image and are very influential.

Models, film stars, pop stars and sports personalities are role models for many young people. Glamorous images of famous people linked to smoking can influence young people.

### What does this image make you think of smoking?



Many countries have banned tobacco advertising to try and improve health. About 3% of all commercial sponsorship of sport in the UK is provided by tobacco sponsorship.

Cigarette advertising has been banned from television since 1965. Cigarette companies started sponsoring sporting events in 1965 as an alternative way of getting their products on TV. Since then cigarette advertising has been banned in some sports.

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### 10. Why do young people smoke?

- They see their parents and other close relatives smoking.
- They have friends who smoke.
- They want to be sociable.
- They want to appear 'mature'.
- They want to appear 'more attractive'.
  
- They believe that smoking calms their nerves. Studies suggest that the 'calmness' is more likely due to the relief of withdrawal symptoms.
  
- They believe that smoking helps to keep their weight down. Smoking does lead to a reduction in weight for most people, but only a third of people who stop smoking actually put on weight. A third lose weight when they stop.
  
- They get pleasure from smoking. Nicotine affects the brain. Smoking relieves the withdrawal symptoms.

- It makes them feel included. Giving and receiving cigarettes helps to set up and maintain friendships.

Self-esteem is an important factor, particularly among girls. Young people with low self-confidence and poor school achievement are more likely to take up smoking.

Why does 'somebody' smoke?



## Smoking and personal relationships

Smokers' hair, skin, breath and clothes smell of tobacco smoke.

Smokers' teeth and fingers are stained yellow with nicotine

Non-smokers, hair skin and clothes will smell of smoke if they have been in a smoky place.

What is it like to snog 'somebody' who smokes?

Does 'somebody' smell of smoke, have yellow teeth and fingers and lots of wrinkles?

## 11. For further information on-line

### General

Wired for health	<a href="http://www.wiredforhealth.gov.uk">www.wiredforhealth.gov.uk</a>
World Health Organisation	<a href="http://www.who.int/home-page">www.who.int/home-page</a>
Health Promotion	<a href="http://www.hpe.org.uk">www.hpe.org.uk</a>
Health Development Agency	<a href="http://www.hea.org.uk">www.hea.org.uk</a>

### Smoking

Cancer Research Campaign	<a href="http://www.crc.org.uk">www.crc.org.uk</a>
ASH	<a href="http://www.ash.org.uk">www.ash.org.uk</a>

### Pathology photos – yet more gory photos

<http://www-medlib.med.utah.edu/WebPath/webpath.html>

Animated images and clip art on smoking to cut and paste into your PowerPoint presentation. [www.clipart.co.uk](http://www.clipart.co.uk)