Warwickshire Stop Smoking Service

Chemicals in Tobacco Smoke

- There are at least 4,000 chemicals in tobacco smoke
- Around 69 of these are carcinogenic, which means that they are proven to cause cancer

Some of the chemicals in tobacco smoke and their common uses

Chemical	Other Uses
Arsenic	A powder in insecticides and glass
Acetic acid	Vinegar
Acetone	A colourless liquid, small quantities found in urine and solvents
Ammonia	Used in toilet cleaner
Benzene	Petrol fumes
Butane	Lighter fuel
Cadmium	Found in batteries
Carbon Monoxide	Found in car exhaust fumes
Copper	A metal that has poisonous salts
Cyanide	Used in chemical weapons
DDT	Insecticide
Ethanol	Used in rubbing alcohol
Formaldehyde	Used by morticians
Hexamine	Barbecue lighter
Hydrocarbons	Found in methane which is used in gasoline
Hydro Cyanide	Used in gas chambers
Lead	Contains poisonous salts
Methane	Found in sewer gas
Methanol	Used in rocket fuel
Napthalene	Used in moth balls
Nicotine	A highly addictive substance found in insecticides
Phosphorus	Found in matches and fertiliser
Polonium	Radioactive fallout
Radon	Radioactive gas
Stearic acid	Comes from solid animal fat
Tar	Road surfaces
Toulene	Industrial solvent

*Where do all these Chemicals come from?

Chemicals in Cigarettes come from the tobacco plant itself, its surroundings, added during the manufacturing process and some are produced when burning the cigarette. These chemicals build up in the body over time and although found at low levels in a single cigarette they can build up to higher levels over years of smoking.
Our cells have special cleaner proteins called 'detoxification enzymes' that mop up harmful chemicals, however the chemicals in smoke can either damage or overwhelm these cleaners. Some of the chemicals such as **Formaldehyde** and **Hydrogen cyanide**, which damage the heart and blood vessels, kill cilia, the small hairs that clean toxins from our airways. This is why a smoker's risk of cancer and other diseases increases the more they smoke and the more years they spend smoking. Compared to non-smokers, the breath and blood stream of smokers can have twice as much **cadmium,** 4 times as much **radioactive Polonium-210** and 10 times as much **arsenic** & **benzene.**

The tobacco plant

Nicotine is found naturally in the tobacco plant. It is a neurotoxin; a poison that kills nerve cells and the plant uses this to stop animals eating it. **Nicotine** is the addictive part of cigarettes that works on the nicotinic receptors in your brain to help you become addicted.

The soil

Tobacco plants absorb various chemicals from the soil and fertilisers. These become stored in the leaves and are released when the leaves are burned. These chemicals include metals such as **cadmium, arsenic and chromium.**

The air

Tobacco plants have large leaves with sticky hairs called trichomes. These hairs can capture chemicals such as radioactive **Polonium-210** from the atmosphere and build up higher concentrations than other plants; these leaves also absorb and concentrate chemicals used in fertilisers and pesticides that are sprayed on to tobacco plants.

Processing

Some dangerous chemicals are formed when tobacco leaves are processed and cigarettes are manufactured. When tobacco is cured to remove moisture from the leaves, bacteria produce nitrates that react with chemicals in the leaves. This produces **nitrosamines,** which are very strong cancer causing chemicals.

Burning

Most of the dangerous chemicals in tobacco smoke are formed through the various chemical reactions that occur as cigarettes burn, forming **Polycyclic Hydrocarbons**, which damage DNA, and are also cancer causing chemicals. Sugars that are added to cigarettes produce **Formaldehyde** when burned. **Nitrogen Oxide** is produced in small amounts in our bodies to expand our airways. However when smokers are smoking, it expands their airways even further, making it easier for their lungs to absorb nicotine and other chemicals. When they are not smoking, it shuts off their internal nitrogen oxide production line, causing their airways to constrict. This is one reason why regular smokers often have difficulty breathing.

Additives

Hundreds of chemicals are added to cigarettes, these include **Ammonia**, which increases the addictive power of nicotine. In order to make cigarettes taste nicer and easier to smoke, manufacturers add other harmless chemicals such as vanilla, menthol, chocolate and liquorice to make the taste and smell less off putting, however these don't make the cigarette any safer.

* Reference www.cancerresearch.org.uk