

Inside story: the body

Want to know more about what happens when you:

Sniff solvents?



This resource booklet tells you all you need to know!

Be creative – make a PowerPoint presentation

Use the information (including the gory photographs) to construct a profile of 'somebody' who abuses solvents. Choose your own 'somebody' from the pictures on slide one. You may be able to scan in a photograph 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 solvents.

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

Discover what solvents do to 'somebody'.

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 that 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.

Solvent abuse

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1. Solvent abuse- commonly known as glue sniffing

Sniffing glue or other solvents to achieve a 'high' (euphoric, intoxicating, drunk effect) is known as '*volatile solvent abuse*' (VSA).

In science, volatile means evaporating quickly.

History of VSA

125 young people a year die in the UK after using solvents, but it is not a new thing. There are references to the inhalation of vapours in Greek and Judaic history.

A wide range of substances are 'sniffed':

- solvent based glues;
- dry cleaning fluids;
- thinners;
- paint;
- correcting fluids;
- aerosol sprays (deodorants, hair sprays, furniture polish etc.);
- butane gas (particularly in cigarette lighter refill canisters);
- petrol;
- fire extinguishers
- and others.

The average home contains about 30 'sniffable' products. There are an enormous number, possibly over 1,000 products, which are commonly available and could be subject to abuse. To be used in this way it would have to:

- easily evaporate at room temperature to form a gas;
- have a psychoactive effect (affect behaviour).

The misused compounds are:

volatile gases/solvents - lighter fuels, spray paint

aerosols - hairsprays, pressurised products

anaesthetic gases - nitrous oxide, ether

nitrites - amyl nitrite and butyl nitrite (poppers)

These products can also be grouped by their active ingredients:

Butane, isobutane, propane	Cigarette lighter refills, fuel gas
Chlorofluorocarbons (halons)	Aerosols, refrigerants, fire extinguishers
Toluene, hexane, xylene	Adhesives, paints, thinners
1,1,1-trichloroethane, Trichloroethylene (Trilene), Tetrachloroethane	Typewriter correcting fluid, degreasing agents, dry cleaning fluid

Look at some products in the home – how many can you find with these substances in them?

The methods of use vary:

- directly inhaling products from their containers;
- pouring substances into plastic bags and inhaling from the bag;
- spraying aerosol sprays directly into the mouth.

2. Why does *'somebody'* do this?

The 'drunk' feeling is apparently not too unpleasant, the effects do not last too long and they are more readily controlled than those of alcohol because the effect is so rapid. So if *'somebody'* feels ill doing it then they may be able to stop sniffing. It's not as easy as that though. See the health effects in section **(3)**.

The symptoms of too much alcohol last much longer and the 'hangover' is much worse than that from solvents. Solvents are also cheaper and the substances are more readily available to young people.

Most 'glue sniffers' are very young, as buying alcohol under the age of 18 is illegal. Nowadays it is also illegal for young people under 16 to buy some substances such as butane lighter fuel because of the dangers of solvent abuse.

Does *'somebody'* use solvents?

Between 6% and 9% of school age children have tried solvents.
There are:

Experimental users –sniffs once or twice to see what its like then does not bother anymore because 'What's the point?'

Regular users - sniffs regularly for several months, then stops because they realise how stupid they are being.

Habitual or long-term users – for some young people they move from regular to long-term use. If they have serious problems in their lives sniffing solvents may seem like a way of coping with them. These people need professional help.

3. What are the effects of solvents?

The effects of solvents are similar to alcohol but are less predictable; people react in different ways.

'Somebody' may:

- feel drowsy and unsteady on their feet;
- have visions and hallucinations;
- have slurred speech;
- have a general feeling of confidence;
- imagine they can fly or swim;
- feel sick (nausea);
- have ringing in the ears (tinnitus)
- suffer sneezing fits
- have flushing (red cheeks)
- suffer coughing fits.

Breathing in the substance (inhaling) causes the drug to take effect very rapidly, causing a 'rush' or 'high'. The initial effects will last for 15 to 45 minutes, though experienced users have been known to maintain the high for up to 12 hours. As the effects wear off rapidly, users have to sniff repeatedly. *'Somebody'* will feel drowsy for about two hours after sniffing and the most common after effect is a headache.

What are the health effects of using solvents?

125 young people a year die in the UK after using solvents.

Sniffing affects the way in which the heart beats and any physical exertion or fright whilst the heart is in this condition can cause heart failure- the heart stops.

If aerosols are sprayed directly into the mouth, they can freeze *'somebody's'* throat, causing suffocation.

Some products also contain more dangerous chemicals, many of which could lead to cancers.

If plastic bags are used to sniff, '*somebody*' could suffocate.

Being high/intoxicated can lead '*somebody*' to do dangerous things.

Recently fewer young people have died from glue sniffing but the number of deaths from sniffing butane cigarette lighter refills has remained steady. Over half of sniffing deaths are associated with this.

Deaths due to gases, aerosols, glue and similar substances account for one in forty of all deaths among teenagers between the ages of 15 and 19. Sniffing deaths continue to be much more common among boys than girls.

Addiction/Dependence

Solvents do not seem to be as addictive as nicotine and alcohol, but because they have strong psychological effects then '*somebody*' will often continue to use them to escape from reality.

4. How do they work?

They act directly on the nervous system. Like alcohol they are depressants - they slow down the action of the nervous system. The inhaled solvents are rapidly absorbed through the lungs and then quickly distributed to the brain and other organs in the bloodstream. The effects therefore appear within minutes of inhalation.

Some solvents, such as carbon tetrachloride, chloroform and dichloromethane, can cause more toxic substances to be made in the body. These affect the liver and can cause liver cancer.



Photo 14 shows liver cancer.

5. Why do people die suddenly from solvent abuse?

The majority of the sudden deaths are:

- as direct toxic effects produced by the solvent;
- choking on vomit;
- suffocation from a plastic bag over the head;
- burns sustained when gasses have been ignited;
- fatal injury while intoxicated.



Photos 18, 19 and 20 show serious brain damage from accidents.

Serious damage has also been observed in:

(a) Respiratory system

Many solvents such as butane irritate the respiratory pathways and can lead to inflammation of the lungs and associated tubes. Inhaled solvents also reduce oxygen levels in inhaled air, which leads to lack of oxygen and then unconsciousness.

(b) Cardiovascular system

Chemicals in solvents affect the beating of the heart and many of the cases of sudden death in solvent abusers are related to the effects on the heart.

Some users spray aerosols directly into the throat, which can often result in death. This is thought to be due to the very cold temperature on nervous tissue in the back of the throat, which can cause a heart attack.

(c) Nervous tissue

Permanent damage can occur to the brain and this can lead to a whole host of problems, depending upon which part of the brain is damaged and how severely. Common problems include blindness, deafness loss of feeling in fingers and toes, confusion, delusions, hallucinations, memory loss and visual disturbances.

(d) Kidneys

Blood and protein in the urine of users is common- this is a sign of kidney damage. If severe it can cause kidney failure.

(e) Liver damage is common as the liver tries to detoxify the chemicals. There is also a possibility of cirrhosis and liver cancer.



Photos 11, 12, 13 & 14 show liver damage.

(f) Skin

Sniffers' rash - skin reacts badly to the solvents and a distinct rash around the nose and mouth are signs of sniffing.

(g) Digestive system

'Coffee ground' vomit with an unusual smell is a known effect – it just looks like coffee grounds.

Sniffing solvents is too dangerous!

6. For further information on-line

General

Wired for health www.wiredforhealth.gov.uk
World Health Organisation www.who.int/home-page
Health Promotion www.hpe.org.uk
Health Development Agency www.hea.org.uk

Pathology photos – yet more gory photos

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