TOBACCO KILLS

A SURVEY OF TOBACCO INDUCED DISEASES

An important topic
Relation of cancer with tobacco

Compiled and Edited by

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<th>Mechanism of action</th>
<th>Desired mental effect</th>
<th>Side effect</th>
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<tbody>
<tr>
<td>LSD and Mushrooms</td>
<td>Hallucinogenic thought to bind to serotonin receptors in the brain, increasing the normal response to serotonin.</td>
<td>Heightened sensory perception and bizarre changes in thought and emotion, hallucinations.</td>
<td>Hallucinations can lead users to dangerous actions. Heavy use leads to permanent brain damage, including impairments of memory and attention span, and can lead to psychosis.</td>
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<tr>
<td>Marijuana</td>
<td>There are receptors for THC in the portions of the brain that influence mood and pleasure, memory, pain sensations, and appetite. THC is thought to work by increasing dopamine release.</td>
<td>Altered sense of time, an enhanced feeling of closeness to others, and an increased sensitivity to stimuli. Large doses can cause hallucinations.</td>
<td>Marijuana use impairs driving ability by slowing reaction time, reducing coordination, and impairing one’s ability to judge time, speed, and distance. Marijuana is also thought to impair short-term memory and to slow learning because it interferes with one’s ability to pay attention and to store and acquire information. Since there are receptors for THC on the hypothalamus, the part of the brain that regulates sex hormone secretion, long-term marijuana use can decrease testosterone production and disrupt menstruation. Long-term use is also associated with loss of motivation.</td>
</tr>
<tr>
<td>Nicotine</td>
<td>Nicotine is a stimulant that affects the brain by stimulating neurons in the cerebral cortex that have nicotine receptors to produce acetylcholine, dopamine, serotonin, and norepinephrine.</td>
<td>Increased alertness and awareness, appetite suppression, relaxation.</td>
<td>Smoking cigarettes increases the odds of obtaining virtually every type of cancer. Nicotine also causes increased heart rate and blood pressure.</td>
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<td>Opiates</td>
<td>Hallucinogenic that causes drowsiness. Opiates act by binding to opiate receptors in neurons that control feelings of pleasure. Opiate receptors are thought to have evolved to bind to opiate that are produced by the brain in response to exercise. These opiate are called endorphins.</td>
<td>A quick intense feeling of pleasure, followed by a sense of well-being and drowsiness.</td>
<td>Addiction, poor motor coordination, depression. High doses can cause coma and death. Opiates are thought to change the brain’s ability to respond to normal pleasures.</td>
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<tr>
<td>Caffeine</td>
<td>Caffeine is a general stimulant, one that affects all cells, not just those of the CNS. Caffeine does not bind receptors; it gains access to cells and, once inside, acts to increase metabolism. It does this by increasing the production of glucose. Increased glucose levels mean that the cell can support increased activity.</td>
<td>Mental alertness, increased energy.</td>
<td>Side effects of caffeine use include insomnia, anxiety, irritability, and increased heart rate.</td>
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<tr>
<td>Cocaine</td>
<td>Cocaine is a stimulant that increases the levels of dopamine and norepinephrine by decreasing reuptake.</td>
<td>A rush of intense pleasure, increased self-confidence, and increased physical vigor.</td>
<td>Increased heart rate and blood pressure, narrowing of blood vessels, dilation of pupils, a rise in body temperature, and reduction of appetite. When cocaine wears off, its effects are followed by a period of deep depression, anxiety, and fatigue. Abuse of this drug can leave a person unable to feel positive feelings without the drug.</td>
</tr>
<tr>
<td>Ecstasy or MDMA</td>
<td>Stimulant and hallucinogenic: it acts to prevent serotonin reuptake. It also floods neurons with several other neurotransmitters.</td>
<td>Euphoria, enhanced emotional and mental clarity, increased energy, heightened sensitivity to touch, and enhanced sexual response.</td>
<td>Studies in rats have shown that ecstasy use permanently damages neurons involved in utilizing serotonin, and may also result in permanent memory damage. Short-term problems include confusion, anxiety, paranoia, depression, and sleeplessness that may last for several weeks. When combined with physical exertion, such as dancing, Ecstasy use may lead to severe dehydration and hypothermia, a serious condition characterized by a life-threatening decrease in body temperature.</td>
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<tr>
<td>Alcohol</td>
<td>Alcohol is a depressant. It gains access to cells in the brain by simply diffusing across cell membranes. It does not require the presence of specific receptors. Alcohol is a central nervous system (CNS) depressant because it inhibits neurotransmission in the reticular formation, thus inhibiting the activity of a large variety of neurons in the brain.</td>
<td>Reduced anxiety and a sense of well being, loss of concern for social constraints.</td>
<td>Impaired judgment, slurred speech, unsteady gait, slower reaction times, uncontrollable emotions. Chronic alcohol abuse leads to loss of intellectual ability and liver damage. Alcohol kills nerve cells that cannot be regenerated. As nerve cells die, the brain actually gets smaller. The frontal lobes, where judgment, thought, and reason are centered, are the first to die.</td>
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<tr>
<td>Amphetamines</td>
<td>CNS stimulant that increases bodily activity by increasing the activity of the reticular formation. These drugs mimic the actions of the neurotransmitter norepinephrine, a hormone produced in response to stress. Amphetamines can also block reuptake from the synapse and inhibit the enzyme that normally breaks down norepinephrine resulting in prolonged stimulation of the postsynaptic cell. Can also increase dopamine release.</td>
<td>Small doses make a person feel more energetic, alert, and confident.</td>
<td>Effects wear off quickly, causing the person to suddenly “crash” when neurotransmitter stores are depleted, leading to depression and fatigue. Over time, the brain responds to amphetamines by decreasing the amount of its own neurotransmitters, leaving the user reliant on increasing doses to achieve the desired effect. Prolonged use of amphetamines also results in aggressiveness, delusions, hallucinations, and violent behaviors. Amphetamine use also causes blood vessels to spasm, clot to form, insufficient blood to flow to the heart, accumulation of fluid in the lungs, and death.</td>
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Amphetamines
Used legally to treat obesity, asthma, and narcolepsy. Herbal products containing ephedra, a drug originally procured from the Mahuang plant and also synthesized in laboratories, have been marketed as treatments for weight loss and for performance enhancement. Methamphetamine is an illegal amphetamine. A crystalline form of methamphetamine called ice is smoked to produce effects similar to crack cocaine.
(a) Resting nerve cell

Sodium pump maintains positive charge outside the axon of a resting nerve cell, at the nodes of Ranvier.

(b) Generation of nerve impulse

Sodium channel opens, allowing Na⁺ to flow into the cell.

(c) Propagation of nerve impulse

1. Nerve impulse starts with inflow of Na⁺ ions, which attract negatively charged ions and repulse positively charged ions.

2. The spread of positively charged ions toward the next sodium channel causes it to open, allowing the Na⁺ to rush in.

3. The depolarization passes down the axon, propagating the nerve impulse.
There is a great deal of evidence linking disturbances in neurotransmission to various diseases. For example, Alzheimer's disease, a progressive mental deterioration in which there is memory loss along with the loss of control of bodily functions that eventually results in death, is thought to involve impaired function of the neurotransmitter acetylcholine in some neurons. Drugs that inhibit the enzyme cholinesterase, which breaks down acetylcholine, can temporarily improve mental function but cannot stop this progressive illness. Depression, a disease that involves feelings of helplessness, despair, and thoughts of suicide, may be caused by or result in decreased levels of the neurotransmitter serotonin. Antidepressants blocking the actions of enzymes that degrade serotonin or inhibit its reuptake help alleviate many symptoms of this disease in some people. Abnormal levels of the neurotransmitter dopamine are believed to be involved in producing the symptoms of ADD [Attention Deficit Disorder]. This neurotransmitter controls emotions and complex movements. Some researchers hypothesize that people with ADD symptoms may have less dopamine than other people. Decreased dopamine levels may cause ADD symptoms because dopamine suppresses the responsivity of neurons to new inputs or stimuli. Therefore, someone with a low concentration of dopamine may respond impulsively in situations in which pausing to process the input would be more effective. The cause of decreased dopamine levels in some people with ADD may actually involve an overabundance of dopamine receptors on the presynaptic cell. During reuptake,
Dopamine receptors on the presynaptic cell remove dopamine from the synapse to prevent continued stimulation of the postsynaptic neuron. Some studies have shown elevated numbers of these receptors in people with ADD. Ritalin, the drug usually prescribed to treat symptoms of ADD, may work to decrease the impact of these extra reuptake receptors. Ritalin is thought to increase dopamine’s ability to stimulate the postsynaptic cell by blocking the actions of the dopamine reuptake receptor. This leaves more dopamine around for a longer period of time, resulting in a decrease in the symptoms of ADD. Other stimulants work through similar mechanisms. In addition to their direct effects on dopamine levels, all stimulants—whether legal like Ritalin obtained by prescription or illegal like cocaine, speed, and other amphetamines—have similar effects on the body. These drugs affect the heart, blood vessels, and lungs on their way to the brain by increasing heart rate, elevating blood pressure, and expanding airways in the lungs. When stimulants are taken in high doses, the user feels euphoric and has more energy and endurance, a sense of power, and a feeling of mental sharpness. As the drug wears off, heightened fatigue, insomnia, poor concentration, irritability, tearfulness, and depression are common; other effects include personality changes, skin rashes, fever, nausea, and headaches. Abusing stimulants can lead to psychotic episodes, delusions, seizures, hallucinations, and sudden death.

Many scientists have attempted to determine whether the brains of those diagnosed with ADD differ from the brains of the rest of the population. The nervous system consists of the brain and spinal cord (CNS) and the nerves that carry information to and from the brain (PNS). The brain is composed of the cerebrum, where most thinking occurs; the cerebellum, in charge of balance and coordination; and the brain stem, which controls many unconscious functions. Neurons are specialized cells whose structure consists of the branching dendrites, the cell body, the axon, and terminal boutons. Nerves are bundles of neurons that carry impulses to the brain and back to the muscles and organs on which they act. Nerve impulses are generated when depolarization of the cell membrane occurs. The electrical impulse is propagated to the ends of the axon, which house chemical neurotransmitters. Nerve impulses cause neurotransmitters to be released into the synapse, from where they make their way to receptors on the next neuron. Binding of the neurotransmitter to the next neuron causes depolarization of that neuron’s cell membrane, and the nerve impulse is thus propagated until it reaches the muscle or organ it will affect.

Neurological disorders can be caused by structural abnormalities of the brain and/or by defects in neurotransmission. Some scientists believe ADD is caused by differences in brain structures in ADD individuals or by deficiencies in the activities of the dopamine neurotransmitter. Ritalin helps people with ADD by blocking dopamine reuptake receptors on the presynaptic nerve cell so that dopamine has longer access to the receptors on the postsynaptic nerve cell.

Dopamine is secreted partly by the release of serotonin, which is a key neurotransmitter in the reward pathway and a logical candidate to study in relation to smoking behavior. When nicotine binds to its receptors, serotonin secretion from the brain increases. The reward pathway proceeds as serotonin stimulates enkephalin in the hypothalamus, which then inhibits GABA at the substantia nigra, finally releasing a specified amount of dopamine at the nucleus accumbens, termed the “reward site.” Another link between nicotine and serotonin has been seen in the rat hippocampus, where smoking clearly reduces serotonin binding to serotonin receptors. Thus, nicotine not only increases serotonin release from the brain, but also decreases its reuptake in the hippocampus. Together, these effects make available a greater amount of serotonin, which ultimately stimulates dopamine release. To confirm the notion that smoking and nicotine affect the dopaminergic system in the human brain, neuroimaging techniques, such as positron emission tomography (PET), have been used to directly measure physiologic, pharmacokinetic and pharmacodynamic events in the same person following nicotine administration. These studies have shown that nicotine has rapid pharmacokinetics, changing cerebral blood flow and brain metabolism.
THE DEGENERATION OF CELLS ARE MORE IN THE PANCREAS (IN BETA CELLS)

Pancreas, producing digestive enzymes and bicarbonate solution

TOXINS OR UNWANTED MATERIALS BLOCKING THE ABSORPTION OF NUTRIENTS IN THE VILLI

Blood vessels in folds of intestines

Capillaries

Brush border cells
The health impact of breathing environmental tobacco smoke is well documented. Tobacco smoke contains over 4000 chemicals in the form of particles and gases. The particulate phase includes tar (itself composed of many chemicals), nicotine, benzene and benzo(a)pyrene. The gas phase includes carbon monoxide, ammonia, dimethyl-nitrosamine, formaldehyde, hydrogen cyanide and acrolein. Some of these have marked irritant properties and some 60 are known or suspected carcinogens (cancer causing substances).
Prevention of
Pre-mature Aging and Disease,
and Recuperation from Disease, are dependent on Healthy Cells.

Fact: The cell is the basic unit of all life. All living things are made up of cells. Your body is made up of more than 10 trillion (10,000,000,000,000) cells. You Are Cells.

Many Researchers now believe that “Free Radical attacks” on the vital interior cell components are the primary cause of Aging and Disease - these attacks cause the body and it's regulatory systems to malfunction and deteriorate through molecular damage.

The Human Cell

Nucleus
Chromosomes
"Intracellular free radical Scavengers eliminate free radicals inside the cells!"

Membranes
Mitochondria
"Intercellular F.R.S.
Mitochondrial DNA
Oxidized Protein

Proteins
Oxidized lipid

In today's environment, chemical pollutants in the air we breathe, the water we drink, and the food we eat are the main source of “Free Radicals” which are foreign toxins or invaders within our bodies. Scientists have concluded that Free Radicals are an abundant and ongoing source of chemical damage which attack and oxidize (destroy) molecules that make up the vital intercomponents of the cell, including proteins, lipids, and DNA. This chemical damage causes changes or "mutations" in our DNA and genes which can create havoc throughout the body's regulatory systems, culminating in Disease and Aging.

"Where as vitamins and minerals can only function OUTSIDE THE CELLS,
Aloe Muclaginous Polysaccharides are very effective
"INTRACELLULAR antioxidants and free radical scavengers."

"The Polysaccharides ARE NOT DIGESTED by the enzyme systems in the human digestive tract; these mannose containing molecules are absorbed by "endocytosis", i.e.; THEY ARE TAKEN UP INTO THE CELL INTACT." Dr. Ivan E. Danhol, Ph.D., M.D.
INTRODUCTION

EFFECT OF EXPOSURE TO ENVIRONMENTAL TOBACCO SMOKE ON THE HUMAN BODY

Burning tobacco is the main source of indoor pollution in the developed world. Tobacco smoke contains about 4,000 chemicals including carcinogens, irritants and toxic gases. The health impact of breathing environmental tobacco smoke is well documented.

Tobacco smoke contains over 4000 chemicals in the form of particles and gases. Many potentially toxic gases are present in higher concentrations in sidestream smoke than in mainstream smoke and nearly 85% of the smoke in a room results from sidestream smoke. The particulate phase includes tar (itself composed of many chemicals), nicotine, benzene and benzo(a)pyrene. The gas phase includes carbon monoxide, ammonia, dimethylnitrosamine, formaldehyde, hydrogen cyanide and acrolein. Some of these have marked irritant properties and some 60 are known or suspected carcinogens (cancer causing substances). The Environmental Protection Agency (EPA) in the USA has classified environmental tobacco smoke as a class A (known human) carcinogen along with asbestos, arsenic, benzene and radon gas Lee Jong-wook, WHO 2004

Breathing other people's smoke is called passive, involuntary or secondhand smoking. The non-smoker breathes "sidestream" smoke from the burning tip of the cigarette and "mainstream" smoke that has been inhaled and then exhaled by the smoker. Secondhand smoke (SHS) is a major source of indoor air pollution. Among the pesticides commonly used are aldicarb and chlorpyrifos, both highly toxic substances. Methyl bromide, an ozone-depleting chemical, is also commonly used to fumigate the soil prior to planting tobacco seedlings. In 1997, over 5.5 million pounds of methyl bromide were applied to tobacco fields worldwide. The effects of these chemicals are not monitored generally but it is known that they leach into the soil and find their way into streams, rivers, and food chains. These substances may indirectly cause the genetic selection of pesticide-resistant mosquitoes or flies, making the control of diseases such as malaria much more difficult.

In 1998, a report by the Independent Scientific Committee on Smoking and Health (SCOTH) reviewed the evidence on passive smoking and concluded that: “Smoking in public places should be restricted on the grounds of public health.” The report added that “Wherever possible, smoking should not be allowed in the work place.” A BMA report, “Towards smoke-free public places” published in December 2002, also called for a ban on smoking in public places. A survey by ASH in April 1999 revealed that about 3 million people in the UK are exposed to passive smoking in their places of work. A national survey commissioned by SmokeFree London found that over half of non-smoking employees (51%) are still exposed to tobacco smoke at work, with almost a third (31%) being exposed every day or most days. A MORI survey commissioned by ASH found that 80% would support a law to require all enclosed workplaces to be smokefree. Public opinion surveys have shown widespread support for smoking restrictions in public places and this has been growing steadily in recent years. The 2002 government commissioned survey of smoking attitudes found that 86% of respondents (including 70% of smokers) agreed that smoking should be restricted at work.
and a similar proportion favoured smoking restrictions in restaurants. The survey also revealed that a majority of people supported smoking restrictions in pubs.

The WHO Framework Convention on Tobacco Control, which was adopted in May 2003 by WHO’s 192 member States, is intended as a common framework in which countries can work together to address the challenge that tobacco use represents at the global level. Tobacco use has also a development dimension. Tobacco causes around 13 500 deaths per day. Half of children are exposed to tobacco smoke at home. 47.5% of men smoke and 10.3% of women smoke. A cigarette is the only legally available consumer product that kills through normal use. 2000: Business: market share: World's largest tobacco companies: 1. China national tobacco company 31% [china has 385 million smokers] 2. Philip Morris 17% 3. British American tobacco (bat) 13% 4. Rjr reynolds 6% 1999: consumption: China annual cigarette volume: around 1.6 trillion cigarettes US: around 415 billion sticks. Japan: 327 billion Russia: 257 billion Germany: 140 billion India: just under 100 billion. Brazil: 97 billion 1999: consumption: about 10 million americans smoke cigars. In the year 2004 the Central Govt of India passed a legislation on advertisement, production, trade and sale of tobacco and tobacco products. Banning the advertisement of tobacco & tobacco products on tv, newspapers and media from 01 may 2004 Reason tobacco leaves contain an alkaloid nicotine which is lethal, carcinogen and causes addiction. Nicotine is the primary chemical responsible for smoking addiction. Nicotine stimulates the production of dopamine in the nucleus accumbens, the brain's "pleasure centre" dopamine and norepinephrine – neurotransmitters within the regions of the brain responsible for feelings of pleasure, which causes a sudden release of glucose. Stimulation is followed by depression and fatigue leading the abuser to seek more nicotine. Addiction to nicotine results in withdrawal symptoms when a chronic smoker tries to stop smoking for 24 hours they had increased anger, hostility and aggression and loss of social cooperation, take longer to regain emotional equilibrium following stress. NIDA FACTS 2006

Table 1 Indoor air standards of nicotine; Table 2 Toxic levels of nicotine; Figure 1 Structure of nicotine molecule [Encyclopedia of Clinical Toxicology & Handbook of Environmental Data on Organic Clinical Data Vol 2]
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