Cigarette smoke contains more than 4,000 identified compounds. Many are known irritants and carcinogens. Since the first Surgeon General's Report on smoking and health in 1964, evidence linking the use of tobacco to illness, injury, and death has continued to mount. Many thousands of studies have documented the adverse health consequences of any type of tobacco, including cigarettes, cigars, and smokeless tobacco.

Specific airborne contaminants from cigarette smoke include respirable particles, nicotine, polycyclic aromatic hydrocarbons, arsenic, DDT, formaldehyde, hydrogen cyanide, methane, carbon monoxide, acrolein, and nitrogen dioxide. Each one of these compounds impacts some part of the body. Irritating gases like ammonia, hydrogen sulfide and formaldehyde affect the eyes, nose and throat. Others, like nicotine, impact the central nervous system. Carbon monoxide reduces the oxygen-carrying capacity of the blood, starving the body of energy. Carcinogenic agents come into prolonged contact with vital organs and with the delicate linings of the nose, mouth, throat, lungs and airways.

Cigarette smoke is one of the six major sources of indoor air pollution, along with combustion by-products, microorganisms and allergens, formaldehyde and other organic compounds, asbestos fibers, and radon and its airborne decay products. The carbon monoxide concentration in cigarette smoke is more than 600 times the level considered safe in industrial plants, and a smoker's blood typically has four to fifteen times more carbon monoxide in it than that of a nonsmoker. Airborne particle concentrations in a home with several heavy smokers can exceed ambient air quality standards.

Sidestream, or second-hand, smoke actually has higher concentrations of some toxins than the mainstream smoke the smoker inhales. Second-hand smoke carries more than thirty known carcinogens. According to a study by the Centers for Disease Control and Prevention (CDC) released in 1996, nearly nine out of 10 nonsmoking Americans are exposed to environmental tobacco smoke as measured by the levels of cotinine in their blood. The presence of cotinine, a chemical the body metabolizes from nicotine, is documentation of exposure to cigarette smoke. On the basis of health hazards of second-hand smoke, the Environmental Protection Agency has classified second-hand smoke as a Group A carcinogen, known to cause cancer in humans.

Cigarettes probably represent the single greatest source of radiation exposure to smokers in the United States today. Two naturally occurring radioactive materials, lead-210 and polonium-210, are present in tobacco. Both of these long-lived decay products of radon are deposited and retained on the large, sticky leaves of tobacco plants. When the tobacco is made into cigarettes and the smoker lights up, the radon decay products are volatilized and enter the lungs. The resulting dose to small segments of the bronchial epithelium of the lungs of about 50 million smokers in the
United States is about 160 mSv per year. (One Sv = 100 rem of radiation.) The dose to the whole body is about 13 mSv, more than ten times the long-term dose rate limit for members of the public.

In 2016, the National Institutes of Health (NIH) and CDC (Centers for Disease Control and Prevention) estimated that almost half a million Americans continue to die each year from tobacco-related disease. One in every five deaths in the United States is smoking related, making smoking the largest preventable cause of illness and premature death in the United States. Heart disease, lung cancer, and chronic obstructive lung diseases such as emphysema or chronic bronchitis are responsible for most smoking-related deaths. In addition, the use of tobacco has been linked to cancers of the larynx, mouth, and esophagus, and as a contributory factor in the development of cancers of the bladder, kidney, pancreas, and cervix. Cigarette smoke aggravates asthma, triggers allergies, and causes changes in bodily tissues that can leave smokers and nonsmokers prone to illness, especially heart disease.

About 180,000 Americans will die prematurely of coronary heart disease every year due to smoking. The risk of a stroke or heart attack is greatly increased by nicotine, which impacts the platelets that enable the blood to clot. Nicotine causes the surface of the platelets to become stickier, thereby increasing the platelets’ ability to aggregate. Thus, a blood clot or thrombus forms more easily. A thrombus in an artery of the heart results in a heart attack; in an artery of the brain it results in a stroke.

Epidemiological studies reveal a direct correlation between the extent of maternal smoking and various illnesses in children. Also, studies show significantly lower heights and weights in six- to eleven-year-olds whose mothers smoke. A pregnant woman who smokes faces increased risks of miscarriage, premature birth, stillbirth, infants with low birth weight, and infants with physical and mental impairments. Cigarette smoking also impairs fertility in women and men, contributes to earlier menopause, and increases a woman’s risk of osteoporosis.

Cigarette smoke contains benzene which, when combined with the radioactive toxins, can cause leukemia. Although smoking does not cause the disease, smoking may boost a person’s risk of getting leukemia by 30 percent.

A long-time smoker increases his or her risk of lung cancer by 1,000 times. In 2011, according to the American Cancer Society, about 130,000 people died of lung cancer directly attributed to cigarette smoke. Approximately 3,400 people each year develop lung cancer from second-hand smoke. Between 1960 and 2000, deaths from lung cancer among women increased by more than 400 percent—exceeding breast cancer deaths.

The addiction to nicotine in cigarette smoke, a chemical and behavioral addiction as powerful as that of heroin, is well documented. The immediate effect of smoking a cigarette can range from tachycardia (an abnormally fast heartbeat) to arrhythmia (an irregular heartbeat). Deep inhalations of smoke lower the pressure in a smoker’s chest and pulmonary blood vessels, which increases the amount of blood flow to the heart. This increased blood flow is experienced as a relaxed feeling. Seconds later, nicotine enters the liver and causes that organ to release sugar, which leads to a “sugar high.” The pancreas then releases insulin to return the blood sugar level to normal, but it makes the smoker irritable and hungry, stimulating a desire to smoke and recover the relaxed, high feeling.

Nicotine also stimulates the nervous system to release adrenaline, which speeds up the heart and respiratory rates, making the smoker feel more tense. Lighting the next cigarette perpetuates the cycle. The greater the number of behaviors linked to the habit, the stronger the habit is and the more difficult to break. Quitting involves combating the physical need and the psychological need, and complete physical withdrawal can take up to two weeks.

From an economic point of view, the Department of Health and Human Services estimates that smoking costs the United States $50 billion in health expenses. That figure is most likely conservative because the medical costs attributable to burn care from smoking-related fires, perinatal care for low birth weight infants of mothers who smoke, and treatment of disease caused by second-hand smoke were not included in the calculation.

In January 2010, independent studies on smoking bans in Europe and the United States showed that the limits on tobacco use in offices and other public buildings and places resulted in reduced rates of heart attacks. On both national and local levels, restrictions on smoking in both Europe and North America corresponded to immediate declines in numbers of reported heart attacks. In 2011, the CDC estimated that 45 million, or 19.3 percent of American adults age eighteen or over, regularly smoked cigarettes. Overall, this represents a continuing downward trend, as the annual prevalence of smoking in America has declined more than 50 percent since 1965.

Many countries, including the United States, have passed laws regulating tobacco advertising and packaging. The United States forbids television advertising for tobacco products and requires health warning labels. In 2012, a federal appellate court upheld proposed regulations that require tobacco companies to reserve 50 percent of the front and back of cigarette packages for health warnings and images. In 2012, Australia's highest court upheld a law banning the use of any brand logos or colors on cigarette packages. Under the Australian law, all cigarette packages must be olive green and feature prominent health warnings and graphic images of the health effects of smoking. The law requires tobacco companies to print the brand name of the cigarettes in small, plain text. Many other countries are considering plain packaging laws similar to the one adopted by Australia.

In May 2016, the U.S. Food and Drug Administration announced it would regulate electronic nicotine delivery systems, including vaporizers, electronic cigarettes (e-cigs), and related devices. The FDA banned the purchase of e-cigarettes for those under 18-years-old and required that products entering the market since 2007 must seek prior approval via an application process that often costs manufacturers in excess of a million dollars. In 2015, 16 percent of high school students and 5.3 percent of middle school students said they were current users of e-cigarettes, making electronic nicotine delivery systems (ENDS) the most common way young people use tobacco.

Resources

Books

**Other**


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