

Harms of Smoking and Health Benefits of Quitting

Key Points

- Tobacco smoke is harmful to smokers and nonsmokers (see Questions 1–3).
- Cigarette smoking causes many types of cancer, including cancers of the lung, esophagus, larynx (voice box), mouth, throat, kidney, bladder, pancreas, stomach, and cervix, as well as acute myeloid leukemia (see Question 2).
- Quitting smoking reduces the health risks caused by exposure to tobacco smoke (see Questions 2 and 8–11).

1. Does tobacco smoke contain harmful chemicals?

Yes. Tobacco smoke contains chemicals that are harmful to both smokers and nonsmokers. Breathing even a little tobacco smoke can be harmful (1, 2).

Of the 4,000 chemicals in tobacco smoke, at least 250 are known to be harmful, including hydrogen cyanide, carbon monoxide, and ammonia (3, 4)

Among the 250 known harmful chemicals in tobacco smoke, more than 50 have been found to cause cancer. These cancer-causing chemicals include the following (3, 4):

- Arsenic
- Benzene
- Beryllium (a toxic metal)
- 1,3-Butadiene (a hazardous gas)
- Cadmium (a toxic metal)
- Chromium (a metallic element)
- Ethylene oxide
- Nickel (a metallic element)
- Polonium-210 (a radioactive chemical element)
- Vinyl chloride

Other toxic chemicals in tobacco smoke are suspected to cause cancer, including the following (3):

- Formaldehyde
- Benzo[a]pyrene
- Toluene

2. What are some of the health problems caused by smoking?

Smoking harms nearly every organ of the body and diminishes a person's overall health. Millions of Americans have health problems caused by smoking.

Smoking is a leading cause of cancer and death from cancer. It causes cancers of the lung, esophagus, larynx, mouth, throat, kidney, bladder, pancreas, stomach, and cervix, as well as acute myeloid leukemia (1).



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Smoking also causes heart disease, stroke, chronic obstructive pulmonary disease (COPD) (chronic bronchitis and emphysema), hip fractures, and cataracts. Smokers are at higher risk of developing pneumonia and other airway infections (1).

A pregnant smoker is at higher risk of having her baby born too early and with an abnormally low birth weight. A woman who smokes during or after pregnancy increases her infant's risk of death from Sudden Infant Death Syndrome (SIDS) (1). Men who smoke are at greater risk of erectile dysfunction (5).

Cigarette smoking and exposure to tobacco smoke cause an estimated 438,000 premature deaths each year in the United States. Of these premature deaths, about 40 percent are from cancer, 35 percent are from heart disease and stroke, and 25 percent are from lung disease (6). Smoking is the leading cause of premature, preventable death in this country.

Regardless of their age, smokers can substantially reduce their risk of disease, including cancer, by quitting.

3. What are the risks of tobacco smoke to nonsmokers?

Secondhand smoke (also called environmental tobacco smoke, involuntary smoking, and passive smoking) is the combination of "sidestream" smoke (the smoke given off by a burning tobacco product) and "mainstream" smoke (the smoke exhaled by a smoker) (2, 3, 7, 8). The U.S. Environmental Protection Agency, the U.S. National Toxicology Program, the U.S. Surgeon General, and the International Agency for Research on Cancer have classified secondhand smoke as a known human carcinogen (cancer-causing agent) (3, 8, 9). Inhaling secondhand smoke causes lung cancer in nonsmoking adults (2). Approximately 3,000 lung cancer deaths occur each year among adult nonsmokers in the United States as a result of exposure to secondhand smoke (7). The U.S. Surgeon General estimates that living with a smoker increases a nonsmoker's chances of developing lung cancer by 20 to 30 percent (2).

Secondhand smoke causes disease and premature death in nonsmoking adults and children (2). Exposure to secondhand smoke may increase the risk of heart disease by an estimated 25 to 30 percent (2). In the United States, exposure to secondhand smoke is thought to cause about 46,000 deaths from heart disease each year (2). Children exposed to secondhand smoke are at an increased risk of SIDS, ear infections, colds, pneumonia, bronchitis, and more severe asthma. Being exposed to secondhand smoke slows the growth of children's lungs and can cause them to cough, wheeze, and feel breathless (2).

For more information, refer to the National Cancer Institute (NCI) fact sheet *Secondhand Smoke and Cancer*, which is available at <http://www.cancer.gov/cancertopics/factsheet/Tobacco/ETS> on the Internet.

4. Is smoking addictive?

Yes. Nicotine is a drug that is naturally present in the tobacco plant and is primarily responsible for a person's addiction to tobacco products, including cigarettes. During smoking, nicotine enters the lungs and is absorbed quickly into the bloodstream and travels to the brain in a matter of seconds. Nicotine causes addiction to cigarettes and other tobacco products that is similar to the addiction produced by using drugs such as heroin and cocaine (10).

5. How much nicotine is in cigarettes and cigars?

Cigarettes, cigars, and other tobacco products vary widely in their content of nicotine, cancer-causing substances, and other toxicants. In a cigarette (which contains less than 1 gram of tobacco), the nicotine content can vary between 13.7 and 23.2 milligrams per gram of dry tobacco (11). In a cigar (which can contain as many as 20 grams of tobacco), the nicotine content can vary between 5.9 and 335.2 milligrams per gram of tobacco (12).

The way a person smokes a tobacco product is more important than the nicotine content of the product in determining how much nicotine gets into the body. Nicotine is absorbed in the lungs and through the lining of the mouth. Increased levels of nicotine are absorbed by inhaling the smoke into the lungs and taking frequent and deep puffs.

For more information about cigars, you may want to read the NCI fact sheet *Cigar Smoking and Cancer*, which can be found at <http://www.cancer.gov/cancertopics/factsheet/Tobacco/cigars> on the Internet.

6. Are other tobacco products, such as smokeless tobacco or pipe tobacco, harmful and addictive?

Yes. All forms of tobacco are harmful and addictive. There is no safe tobacco product.

In addition to regular cigarettes and cigars, other forms of tobacco include smokeless tobacco (also called chewing tobacco, snuff, and snus), pipes, hookahs (waterpipes), bidis, and kreteks. Although most research has focused on the harms of cigarette smoking, all forms of tobacco are harmful.

All tobacco products contain nicotine and cancer-causing substances. Both smokeless tobacco and smoking tobacco are known to cause cancer in humans (3, 8). These products may also cause heart attacks, mouth problems, and other diseases.

- **Cigars:** Information about cigars and cancer is available in the NCI fact sheet *Cigar Smoking and Cancer* at <http://www.cancer.gov/cancertopics/factsheet/Tobacco/cigars> on the Internet.
- **Smokeless tobacco:** Information about smokeless tobacco and cancer can be found in the NCI fact sheet *Smokeless Tobacco and Cancer* at <http://www.cancer.gov/cancertopics/factsheet/Tobacco/smokeless> on the Internet.
- **Pipes:** Pipe smoking causes lung cancer and increases the risk of cancers of the mouth, throat, larynx, and esophagus (8, 13).
- **Hookahs or waterpipes** (other names include argileh, ghelyoon, hubble bubble, shisha, boory, goza, and narghile): A hookah is a device used to smoke tobacco. The smoke passes through a partially filled water bowl before being inhaled by the smoker. Some people think hookah smoking is less harmful and addictive than smoking regular cigarettes (14), but all forms of tobacco smoking are harmful and addictive. Tobacco smoke, including the smoke produced by a hookah, contains harmful chemicals such as carbon monoxide and cancer-causing substances (15).
- **Bidis:** A bidi is a flavored cigarette made by rolling tobacco in a dried leaf from the tendu tree, which is native to India. Bidi use is associated with heart attacks and cancers of the mouth, throat, larynx, esophagus, and lung (8, 16).
- **Kreteks:** A kretek is a cigarette made with a mixture of tobacco and cloves. Smoking kreteks is associated with lung cancer and other lung diseases (16).

7. Is there a tobacco product that is less hazardous than cigarettes?

All tobacco products are harmful and cause cancer, and the use of these products is strongly discouraged. There is no safe level of tobacco use. People who use any type of tobacco product should be urged to quit. For help with quitting, refer to the NCI fact sheet *Where To Get Help When You Decide To Quit Smoking* at <http://www.cancer.gov/cancertopics/factsheet/tobacco/help-quitting> on the Internet.

8. What are the immediate benefits of quitting smoking?

The immediate health benefits of quitting smoking are substantial:

- Heart rate and blood pressure, which are abnormally high while smoking, begin to return to normal.
- Within a few hours, the level of carbon monoxide in the blood begins to decline. (Carbon monoxide reduces the blood's ability to carry oxygen.)
- Within a few weeks, people who quit smoking have improved circulation, produce less phlegm, and don't cough or wheeze as often.
- Within several months of quitting, people can expect substantial improvements in lung function (17).
- In addition, people who quit smoking will have an improved sense of smell, and food will taste better.

9. What are the long-term benefits of quitting smoking?

Quitting smoking reduces the risk of cancer and other diseases, such as heart disease and COPD, caused by smoking.

People who quit smoking, regardless of their age, are less likely than those who continue to smoke to die from smoking-related illness:

- **Quitting at age 30:** Studies have shown that smokers who quit at about age 30 reduce their chance of dying prematurely from smoking-related diseases by more than 90 percent (18, 19).
- **Quitting at age 50:** People who quit at about age 50 reduce their risk of dying prematurely by 50 percent compared with those who continue to smoke (19).
- **Quitting at age 60:** Even people who quit at about age 60 or older live longer than those who continue to smoke (19).

10. Does quitting smoking lower the risk of cancer?

Yes. Quitting smoking reduces the risk of developing and dying from cancer. However, it takes a number of years after quitting for the risk of cancer to start to decline. This benefit increases the longer a person remains smoke free (1).

The risk of premature death and the chance of developing cancer from smoking cigarettes depend on many factors, including the number of years a person smokes, the number of cigarettes he or she smokes per day, the age at which he or she began smoking, and whether or not he or she was already ill at the time of quitting. For people who have already developed cancer, quitting smoking reduces the risk of developing a second cancer (20–22).

11. Should someone already diagnosed with cancer bother to quit smoking?

Yes. There are many reasons that people diagnosed with cancer should quit smoking. For those having surgery, chemotherapy, or other treatments, quitting smoking helps improve the body's ability to heal and respond to therapy (1, 20). It also lowers the risk of pneumonia and respiratory failure (1, 20). Moreover, quitting smoking may lower the risk of the cancer returning or a second cancer developing (20–22).

12. How can I get help to quit smoking?

NCI and other agencies and organizations can help smokers quit:

- Go online to **Smokefree.gov** (<http://www.smokefree.gov>), a Web site created by NCI's Tobacco Control Research Branch, and use the Step-by-Step Quit Guide.
- Call the **NCI Smoking Quitline** at **1-877-44U-QUIT (1-877-448-7848)** for individualized counseling, printed information, and referrals to other sources.
- Refer to the NCI fact sheet *Where To Get Help When You Decide To Quit Smoking*, which is available at <http://www.cancer.gov/cancertopics/factsheet/tobacco/help-quit> on the Internet.

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Related NCI materials and Web pages:

- National Cancer Institute Fact Sheet 10.15, *Smokeless Tobacco and Cancer* (<http://www.cancer.gov/cancertopics/factsheet/Tobacco/smokeless>)
- National Cancer Institute Fact Sheet 10.17, *"Light" Cigarettes and Cancer Risk* (<http://www.cancer.gov/cancertopics/factsheet/Tobacco/light-cigarettes>)
- National Cancer Institute Fact Sheet 10.18, *Secondhand Smoke and Cancer* (<http://www.cancer.gov/cancertopics/factsheet/Tobacco/ETS>)
- National Cancer Institute Fact Sheet 10.22, *How To Handle Withdrawal Symptoms and Triggers When You Decide To Quit Smoking* (<http://www.cancer.gov/cancertopics/factsheet/Tobacco/symptoms-triggers-quitting>)
- National Cancer Institute Fact Sheet 10.23, *Where To Get Help When You Decide To Quit Smoking* (<http://www.cancer.gov/cancertopics/factsheet/Tobacco/help-quitting>)
- *Clearing the Air: Quit Smoking Today* (http://www.smokefree.gov/pubs/clearing-the-air_acc.pdf)

How can we help?

We offer comprehensive research-based information for patients and their families, health professionals, cancer researchers, advocates, and the public.

- **Call** NCI's Cancer Information Service at 1-800-4-CANCER (1-800-422-6237)
- **Visit** us at <http://www.cancer.gov> or <http://www.cancer.gov/espanol>
- **Chat** using LiveHelp, NCI's instant messaging service, at <http://www.cancer.gov/livehelp>
- **E-mail** us at cancergovstaff@mail.nih.gov
- **Order** publications at <http://www.cancer.gov/publications> or by calling 1-800-4-CANCER
- **Get help** with quitting smoking at 1-877-44U-QUIT (1-877-448-7848)

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