

Smokeless Tobacco and Cancer

Key Points

- Smokeless tobacco is tobacco that is not burned. Smokeless tobacco is also known as chewing tobacco, oral tobacco, spit or spitting tobacco, dip, chew, and snuff/snus (see Question 1).
- Smokeless tobacco causes cancer and other diseases (see Questions 2–4).
- Smokeless tobacco is not a safe substitute for cigarettes (see Question 6).

1. What is smokeless tobacco?

Smokeless tobacco is tobacco that is not burned. It is also known as chewing tobacco, oral tobacco, spit or spitting tobacco, dip, chew, and snuff. Most people chew or suck (dip) the tobacco in their mouth and spit out the tobacco juices that build up, although “spitless” smokeless tobacco has also been developed. Nicotine in the tobacco is absorbed through the lining of the mouth.

People in many regions and countries, including North America, northern Europe, India and other Asian countries, and parts of Africa, have a long history of using smokeless tobacco products.

There are two main types of smokeless tobacco:

- **Chewing tobacco**, which is available as loose leaves, plugs (bricks), or twists of rope. A piece of tobacco is placed between the cheek and lower lip, typically toward the back of the mouth. It is either chewed or held in place. Saliva is spit or swallowed.
- **Snuff**, which is finely cut or powdered tobacco. It may be sold in different scents and flavors. It is packaged moist or dry; most American snuff is moist. It is available loose, in dissolvable lozenges or strips, or in small pouches similar to tea bags. The user places a pinch or pouch of moist snuff between the cheek and gums or behind the upper or lower lip. Another name for moist snuff is snus (pronounced “snoose”). Some people inhale dry snuff into the nose.

2. Are there harmful chemicals in smokeless tobacco?

Yes. There is no safe form of tobacco. At least 28 chemicals in smokeless tobacco have been found to cause cancer (1). The most harmful chemicals in smokeless tobacco are tobacco-specific nitrosamines, which are formed during the growing, curing, fermenting, and aging of tobacco. The level of tobacco-specific nitrosamines varies by product. Scientists have found that the nitrosamine level is directly related to the risk of cancer.

In addition to a variety of nitrosamines, other cancer-causing substances in smokeless tobacco include polonium-210 (a radioactive element found in tobacco fertilizer) and polynuclear aromatic hydrocarbons (also known as polycyclic aromatic hydrocarbons) (1).

3. Does smokeless tobacco cause cancer?

Yes. Smokeless tobacco causes oral cancer, esophageal cancer, and pancreatic cancer (1).



4. Does smokeless tobacco cause other diseases?

Yes. Using smokeless tobacco may also cause heart disease, gum disease, and oral lesions other than cancer, such as leukoplakia (precancerous white patches in the mouth) (1).

5. Can a user get addicted to smokeless tobacco?

Yes. All tobacco products, including smokeless tobacco, contain nicotine, which is addictive (1). Users of smokeless tobacco and users of cigarettes have comparable levels of nicotine in the blood. In users of smokeless tobacco, nicotine is absorbed through the mouth tissues directly into the blood, where it goes to the brain. Even after the tobacco is removed from the mouth, nicotine continues to be absorbed into the bloodstream. Also, the nicotine stays in the blood longer for users of smokeless tobacco than for smokers (2).

The level of nicotine in the blood depends on the amount of nicotine in the smokeless tobacco product, the tobacco cut size, the product's pH (a measure of its acidity or basicity), and other factors (3).

A Centers for Disease Control and Prevention study of the 40 most widely used popular brands of moist snuff showed that the amount of nicotine per gram of tobacco ranged from 4.4 milligrams to 25.0 milligrams (3). Other studies have shown that moist snuff had between 4.7 and 24.3 milligrams per gram of tobacco, dry snuff had between 10.5 and 24.8 milligrams per gram of tobacco, and chewing tobacco had between 3.4 and 39.7 milligrams per gram of tobacco (4).

6. Is using smokeless tobacco less hazardous than smoking cigarettes?

Because all tobacco products are harmful and cause cancer, the use of all of these products should be 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 National Cancer Institute (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.

As long ago as 1986, the advisory committee to the Surgeon General concluded that the use of smokeless tobacco "is not a safe substitute for smoking cigarettes. It can cause cancer and a number of noncancerous oral conditions and can lead to nicotine addiction and dependence" (5). Furthermore, a panel of experts convened by the National Institutes of Health (NIH) in 2006 stated that the "range of risks, including nicotine addiction, from smokeless tobacco products may vary extensively because of differing levels of nicotine, carcinogens, and other toxins in different products" (6).

7. Should smokeless tobacco be used to help a person quit smoking?

No. There is no scientific evidence that using smokeless tobacco can help a person quit smoking (7). Because all tobacco products are harmful and cause cancer, the use of all tobacco 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, ask your doctor about individual or group counseling, telephone quitlines, or other methods.

8. How can I get help quitting smokeless tobacco?

NCI offers free information about quitting smokeless tobacco:

- Call **NCI's Smoking Quitline** at **1-877-44U-QUIT (1-877-448-7848)**. Talk with a smoking cessation counselor about quitting smokeless tobacco. You can call the quitline, within the United States, Monday through Friday, 8:00 a.m. to 8:00 p.m., Eastern time.
- Use **LiveHelp online chat**. For information about smokeless tobacco, click on the "Quitting Smoking" button at <https://cissecure.nci.nih.gov/livehelp/welcome.asp> on the Internet. You can have a confidential online text chat with an NCI smoking cessation counselor Monday through Friday, 8:00 a.m. to 11:00 p.m., Eastern time.

The National Institute of Dental and Craniofacial Research (<http://www.nidcr.nih.gov>), the NIH agency that supports dental, oral, and craniofacial research, offers a guide for quitting smokeless tobacco. *Smokeless Tobacco: A Guide for Quitting* can be accessed at

<http://www.nidcr.nih.gov/OralHealth/Topics/SmokelessTobacco/SmokelessTobaccoAGuideforQuitting.htm> on the Internet. More information about smokeless tobacco can be found at <http://www.nidcr.nih.gov/OralHealth/Topics/SmokelessTobacco/> on the Internet.

For other resources, you may be interested in 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-quitting> on the Internet.

Selected References

1. International Agency for Research on Cancer. *Smokeless Tobacco and Some Tobacco-Specific N-Nitrosamines*. Lyon, France: World Health Organization International Agency for Research on Cancer; 2007. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans Volume 89.
2. National Cancer Institute. *Smokeless Tobacco or Health: An International Perspective*. Bethesda, MD: National Cancer Institute; 1992. Smoking and Tobacco Control Monograph 2.
3. Richter P, Hodge K, Stanfill S, Zhang L, Watson C. Surveillance of moist snuff: Total nicotine, moisture, pH, un-ionized nicotine, and tobacco-specific nitrosamines. *Nicotine and Tobacco Research* 2008; 10(11): 1645–1652. [[PubMed Abstract](#)]
4. Djordjevic MV, Doran KA. Nicotine content and delivery across tobacco products. *Handbook of Experimental Pharmacology* 2009; 192:61–82. [[PubMed Abstract](#)]
5. U.S. Department of Health and Human Services. *The Health Consequences of Using Smokeless Tobacco: A Report of the Advisory Committee to the Surgeon General*. Bethesda, MD: U.S. Department of Health and Human Services, 1986.
6. NIH State-of-the-Science Panel. National Institutes of Health State-of-the-Science conference statement: Tobacco use: Prevention, cessation, and control. *Annals of Internal Medicine* 2006; 145(11):839–844. [[PubMed Abstract](#)]
7. The Clinical Practice Guideline Treating Tobacco Use and Dependence 2008 Update Panel, Liaisons, and Staff. A clinical practice guideline for treating tobacco use and dependence: 2008 update. A U.S. Public Health Service report. *American Journal of Preventive Medicine* 2008; 35(2):158–176. [[PubMed Abstract](#)]

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Related NCI materials and Web pages:

- 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 10.19, *Harms of Smoking and Health Benefits of Quitting* (<http://www.cancer.gov/cancertopics/factsheet/Tobacco/cessation>)
- 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>)

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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