



HEALTH HARMS FROM SMOKELESS TOBACCO USE

Although the overall prevalence rate of smokeless tobacco products in the United States is fairly low relative to cigarette and cigar prevalence, there are pockets of high usage. For instance, in rural areas, the rate of smokeless tobacco usage was 10.0 percent in 2005, compared to 2.0 percent in large urban areas or 3.7 percent in smaller urban areas.¹ In addition, high school boys (13.4 percent) use smokeless tobacco at much higher rates than high school girls (2.3 percent).² With more smokeless tobacco products now available, it is important to consider the health risks.

The health harms from using smokeless tobacco products vary as widely as the types of products themselves and the manner in which they are used (e.g., exclusively with no other tobacco products, in conjunction with cigarette smoking). Each country has its own popular forms of smokeless tobacco. Furthermore, these products, from moist chewing tobacco in the U.S. to betel quid with tobacco in India, differ greatly in the health harms they cause due to the various chemicals or other products mixed in with the tobacco. Despite the claims by some tobacco companies and a few harm reduction proponents that using smokeless tobacco products is less harmful than smoking or that smokeless tobacco should be used as a tool to help smokers quit smoking (but continue using tobacco in the form of smokeless tobacco), the fact remains that using smokeless tobacco still exposes users to many harmful chemicals and still heightens a user's risk for many of the same health problems as smoking.

General Health Risks

The Surgeon General has determined that the use of oral snuff can lead to oral cancer, gum disease, and nicotine addiction,³ and increases the risk of cardiovascular disease, including heart attacks.⁴

Cancer: Smokeless tobacco users are at a heightened risk for oral cancer compared to non-users and these cancers can form within five years of regular use.⁵ Constant exposure to tobacco juice causes cancer of the esophagus, pharynx, larynx, stomach and pancreas. Spit tobacco causes leukoplakia, a disease of the mouth characterized by white patches and oral lesions on the cheeks, gums, and/or tongue. Leukoplakia, which can lead to oral cancer, occurs in more than half of all users in the first three years of use. Studies have found that 60 to 78 percent of smokeless tobacco users have oral lesions.⁶

The U.S. Surgeon General, National Toxicology Program, and the World Health Organization (WHO) recognize that using smokeless tobacco products can cause oral cancer.^{7,8,9} The National Cancer Institute has identified 28 carcinogens in smokeless tobacco products produced in the U.S.,^{10,11} at levels much higher than in smokeless tobacco products from countries such as Sweden.¹² A 2007 study in *Cancer Epidemiology Biomarkers & Prevention* found that the carcinogenic NNK levels in smokeless tobacco users were comparable to those in cigarette smokers.¹³ A 2007 study in *The Lancet* found that "use of Swedish snus should be added to the list of tentative risk factors for pancreatic cancer."¹⁴ A 2008 study from the WHO International Agency for Research on Cancer concluded that smokeless tobacco users have an 80 percent higher risk of developing oral cancer and a 60 percent higher risk of developing pancreatic and esophageal cancer.¹⁵

Gum Disease: Gum disease (gingivitis) is caused by smokeless tobacco.¹⁶ Smokeless tobacco has also been linked to dental caries (tooth decay). A study by the National Institutes of Health and the Centers for Disease Control and Prevention found chewing tobacco users were four times more likely than non-users to have decayed dental root surfaces.¹⁷

Nicotine Addiction: Regardless of the differences between smokeless tobacco products, they all contain nicotine, a highly addictive chemical, and cause equivalent nicotine levels in the blood as smoking cigarettes. Smokeless tobacco products are as addictive as cigarettes and can cause the same type of dependence, which makes quitting smokeless tobacco very difficult.¹⁸ Furthermore, nicotine may factor into coronary artery disease, peripheral vascular disease, hypertension, peptic ulcer disease, and fetal effects.¹⁹

Different Products, Different Risks

A comparison is often made between the smokeless tobacco products in Sweden and those in the U.S. However, smokeless tobacco products sold in Sweden are manufactured according to Sweden's laws governing food²⁰ and must meet additional industry established quality indicators (known as the Gothiatek

system²¹) involving ingredients and measurements for harmful elements such as tobacco specific nitrosamines (TSNAs) and other toxins and carcinogens. Products that have been subjected to this process have been found to be lower in TSNA levels (e.g., some Swedish brands have been found to possess only 2 percent of the TSNA levels of their U.S. counterparts) and maintain these low levels over time.²² In contrast, products sold in the U.S. have no uniform manufacturing code, are not regulated, and contain significantly higher levels of carcinogenic substances, including TSNAs, which, unlike their Swedish counterparts, have been found to increase over time.²³ As a result, *U.S. smokeless tobacco products have been found to pose serious health risks and are a known cause of cancer.*²⁴

On the other end of the spectrum, in India, Pakistan, Bangladesh, Sri Lanka, Myanmar, Thailand, the Lao People's Republic, Cambodia, the Philippines, and Palau, smokeless tobacco products such as betel quid with tobacco, areca nut with tobacco, or gutka had significantly higher rates of oral, pharyngeal, and esophageal cancers. People who chewed betel quid with tobacco also showed higher prevalence of leukoplakia.²⁵

Cigarettes vs. Smokeless Tobacco

Considering that smokeless tobacco products still contain varying levels and types of carcinogens²⁶ and cause other types of health risks compared to cigarettes, the only way to reduce an individual tobacco users health risks to the maximum extent possible is to quit using tobacco entirely with evidence-based treatments that have been scientifically documented to help people quit using tobacco (e.g., nicotine gum and patch, telephone-based behavioral counseling/quitlines).²⁷

Smokeless tobacco use during youth can lead to a lifetime of addiction to smokeless tobacco or, frequently, to cigarettes, as the nicotine addiction created by smokeless use ultimately leads to habitual smoking.²⁸ Evidence shows that adolescent boys who use smokeless tobacco products have a higher risk of becoming cigarette smokers within four years.²⁹

Campaign for Tobacco-Free Kids, July 9, 2008 / Ann Boonn

More information on smokeless tobacco can be found at
<http://www.tobaccofreekids.org/research/factsheets/index.php?CategoryID=33>.

¹ Substance Abuse and Mental Health Services Administration. *Results from the 2006 National Survey on Drug Use and Health: National Findings*, Rockville, MD: Office of Applied Studies, NSDUH Series H-32, DHHS Publication No. SMA 07-4293, 2007, <http://www.oas.samhsa.gov/nsduh/2k6nsduh/2k6Results.pdf>.

² CDC, "Youth Risk Behavior Surveillance—United States, 2007," *MMWR Surveillance Summaries* 57(SS-4):1-131, June 6, 2008, http://www.cdc.gov/healthyyouth/yrbs/pdf/yrbss07_mmr.pdf.

³ U.S. Department of Health and Human Services (HHS), *The Health Consequences of Using Smokeless Tobacco: A Report of the Advisory Committee to the Surgeon General*, Bethesda, MD 20892, NIH Publication No. 86-2874, April 1986, <http://profiles.nlm.nih.gov/NN/B/B/F/C/>.

⁴ Bolinder G, et al., "Smokeless tobacco use and increased cardiovascular mortality among Swedish construction workers," *American Journal of Public Health (AJPH)* 84(3), 1998.

⁵ The S.T.O.P. Guide (The Smokeless Tobacco Outreach and Prevention Guide): A Comprehensive Directory of Smokeless Tobacco Prevention and Cessation Resources. Applied Behavioral Science Press, 1997; Hatsukami, D & Severson, H, "Oral Spit Tobacco: Addiction, Prevention and Treatment," *Nicotine and Tobacco Research* 1:21-44, 1999.

⁶ "The Smokeless Tobacco Outreach and Prevention Guide," Applied Behavioral Science Press, 1997.

⁷ HHS, *The Health Consequences of Using Smokeless Tobacco: A Report of the Advisory Committee to the Surgeon General*, Bethesda, MD: Public Health Service, NIH Publication No. 86-2874, April 1986, <http://profiles.nlm.nih.gov/NN/B/B/F/C/>

⁸ National Toxicology Program, *10th Report on Carcinogens: Revised December 2002*, Public Health Service, HHS, December 2002, <http://ehp.niehs.nih.gov/roc/tenth/profiles/s176toba.pdf>.

⁹ World Health Organization (WHO) Scientific Advisory Committee on Tobacco Product Regulation, Scientific Advisory Committee on Tobacco Product Regulation Recommendation on Smokeless Tobacco Products, 2003.

¹⁰ National Institutes of Health (NIH), National Cancer Institute (NCI), *Smoking and Tobacco Control Monograph 2: Smokeless Tobacco or Health: An International Perspective*, September 1992. http://rex.nci.nih.gov/NCI_MONOGRAPHS/MONO2/M2-Ch.3.pdf.

-
- ¹¹ NIH, NCI, *Smoking and Tobacco Control Monograph 2: Smokeless Tobacco or Health: An International Perspective*, September 1992. http://rex.nci.nih.gov/NCI_MONOGRAPHS/MONO2/M2-Ch.3.pdf.
- ¹² Brunnemann KD, Qi J, & Hoffmann D, *Aging of Oral Moist Snuff and the Yields of Tobacco-Specific N-Nitrosamines (TSNA): Progress Report*, American Health Foundation. Prepared for the Massachusetts Tobacco Control Program, Department of Public Health, June 22, 2001, http://www.smokeless.de/news/24_09_02_nitrosamine_berichte_dr_brunnemann/docs/Aging_of_Oral_Moist_Snuff.pdf.
- ¹³ Hecht, SS, et al., "Similar Exposure to a Tobacco-Specific Carcinogen in Smokeless Tobacco Users and Cigarette Smokers," *Cancer Epidemiology Biomarkers & Prevention* 16(8):1-6, 2007.
- ¹⁴ Luo, J, et al., "Oral use of Swedish moist snuff (snus) and risk for cancer of the mouth, lung, and pancreas in male construction workers: a retrospective cohort study," *The Lancet*, May 10, 2007.
- ¹⁵ Boffetta, P, et al., "Smokeless tobacco and cancer," *The Lancet* 9:667-675, 2008.
- ¹⁶ "The Smokeless Tobacco Outreach and Prevention Guide," Applied Behavioral Science Press, 1997.
- ¹⁷ Tomar SL, "Chewing Tobacco Use and Dental Caries Among U.S. Men," *Journal of the American Dental Association* 130:160, 1999.
- ¹⁸ HHS, *The Health Consequences of Using Smokeless Tobacco: A Report of the Advisory Committee to the Surgeon General*, Bethesda, MD 20892, NIH Publication No. 86-2874, April 1986, <http://profiles.nlm.nih.gov/NN/B/B/F/C/>.
- ¹⁹ HHS, *The Health Consequences of Using Smokeless Tobacco: A Report of the Advisory Committee to the Surgeon General*, Bethesda, MD 20892, NIH Publication No. 86-2874, April 1986, <http://profiles.nlm.nih.gov/NN/B/B/F/C/>.
- ²⁰ See Swedish Food Regulations at <http://www.slv.se/engdefault.asp> (website accessed April 16, 2003).
- ²¹ Website describing Gothiatek system accessed March 24, 2003, http://www.gothiatek.com/index.asp?content_id=45&language=English.
- ²² Brunnemann KD, Qi J, & Hoffmann D, *Aging of Oral Moist Snuff and the Yields of Tobacco-Specific N-Nitrosamines (TSNA): Progress Report*, American Health Foundation. Prepared for the Massachusetts Tobacco Control Program, Department of Public Health, June 22, 2001, http://www.smokeless.de/news/24_09_02_nitrosamine_berichte_dr_brunnemann/docs/Aging_of_Oral_Moist_Snuff.pdf.
- ²³ Brunnemann KD, Qi J, & Hoffmann D, *Aging of Oral Moist Snuff and the Yields of Tobacco-Specific N-Nitrosamines (TSNA): Progress Report*, American Health Foundation. Prepared for the Massachusetts Tobacco Control Program, Department of Public Health, June 22, 2001, http://www.smokeless.de/news/24_09_02_nitrosamine_berichte_dr_brunnemann/docs/Aging_of_Oral_Moist_Snuff.pdf.
- ²⁴ HHS, *The Health Consequences of Using Smokeless Tobacco: A Report of the Advisory Committee to the Surgeon General*, Bethesda, MD: Public Health Service, NIH Publication No. 86-2874, April 1986, <http://profiles.nlm.nih.gov/NN/B/B/F/C/>; NIH, NCI, *Smoking and Tobacco Control Monograph 2: Smokeless Tobacco or Health: An International Perspective*, September 1992. http://rex.nci.nih.gov/NCI_MONOGRAPHS/MONO2/M2-Ch.3.pdf; National Toxicology Program, Public Health Service, HHS, *10th Report on Carcinogens: Revised December 2002*, December 2002, <http://ehp.niehs.nih.gov/roc/tenth/profiles/s176toba.pdf>; WHO Scientific Advisory Committee on Tobacco Product Regulation, Scientific Advisory Committee on Tobacco Product Regulation Recommendation on Smokeless Tobacco Products, 2003.
- ²⁵ International Agency for Research on Cancer (IARC), WHO, "Betel-quid and Areca-nut Chewing and Some Areca-nut-derived Nitrosamines," *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans*, vol. 85, September 30, 2004, <http://monographs.iarc.fr/ENG/Monographs/vol85/volume85.pdf>.
- ²⁶ Stepanov, I, et al., "Tobacco-specific nitrosamines in new tobacco products," *Nicotine and Tobacco Research* 8(2): 309-313, 2006.
- ²⁷ Henley, SJ, et al., "Tobacco-related disease mortality among men who switched from cigarettes to spit tobacco," *Tobacco Control* 16:22-28, 2007.
- ²⁸ Institute for Social Research, The University of Michigan, *Monitoring the Future*, <http://monitoringthefuture.org/pressreleases/00cigpr.pdf>; American Academy of Pediatrics, "Things You Should Know about Smokeless Tobacco," <http://www.aap.org/advocacy/chmchew2.htm>; CDC, "Is smokeless tobacco safer than cigarettes?," *SGR4Kids*, <http://www.cdc.gov/tobacco/sgr/sgr4kids/smokless.htm>.
- ²⁹ Tomar, S, "Is use of smokeless tobacco a risk factor for cigarette smoking? The U.S. experience," *Nicotine & Tobacco Research* 5(4):561-569, August 2003.