

Smokeless Tobacco

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Smokeless tobacco is widely used around the world; projected sales volume for 2015 is approximately 749,000 tonnes.¹ Unlike cigarettes and other forms of tobacco, smokeless tobacco is not burned. Instead, nicotine is absorbed into the body through direct contact of the tobacco with mucous membranes in the mouth or nose.

Smokeless tobacco has gone from a product once used predominantly by older men to one used principally by boys and young men. Statistics Canada data collected in 2013 showed that six per cent of youth aged 15 to 19, 10 per cent of young adults aged 20 to 24 and eight per cent of everyone aged 15 and older reported having ever tried smokeless tobacco.²

Smokeless tobacco comes in many forms, which include

- dipping tobacco, which is loose and placed between the lower or upper lip and gums
- chewing tobacco, which is chewed
- iqmik, which is an Alaskan tobacco product that also contains punk ash
- snuff, which is a type of tobacco that is inhaled or "snuffed" into the nasal cavity
- snus, which is similar to dipping tobacco but processed in a different way and sometimes sold prepackaged rather than loose
- creamy snuff, which is a fluid tobacco mixture marketed as a dental hygiene aid that is also used for recreation
- naswar, which is an Afghan tobacco product similar to dipping tobacco
- tobacco gum, which is a kind of chewing gum containing tobacco
- gutka, which is a mixture of tobacco, areca (betel) nut and various flavourings sold in South Asia

- dissolvable tobacco, which completely dissolves in the mouth
- toombak and shammah, which are preparations found in North Africa, East Africa and the Arabian peninsula³

Snuff, dipping tobacco and chewing tobacco are the three most commonly used forms in North America. Snuff is finely ground tobacco sold as dry powder.⁴ Dipping tobacco is slightly coarser and is sold moist, either loose or in sachets (small teabag-like pouches).⁵ Chewing tobacco is coarser than dipping tobacco and exists in three forms: loose leaf (sold in a soft package or pouch), plug (sold in a small block or brick form) and twist (dried tobacco leaves that are twisted into strands; also called "bits" or "bites").⁶ Dissolvable tobacco comes in three forms: strips (similar to breath mint strips), orbs (similar to breath mints) and sticks (similar to toothpicks).⁷

History

Chewing is one of the oldest methods of consuming tobacco. Indigenous peoples of both North and South America chewed the leaves of the tobacco plant long before the arrival of Europeans.⁶ Modern chewing tobacco is cured (dried), cut, fermented and processed. Sweeteners or flavourings may be added to make the tobacco more palatable. Users absorb the nicotine by chewing the tobacco for several hours.⁸ In Central, South and Southeast Asia, smokeless tobacco is usually chewed with another substance, such as wood ash, lime, cotton, sesame or betel quid (a mixture of a betel nut, lime, and leaves).⁹⁻¹¹

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Snuff use was first recorded among the Indigenous peoples of South America.⁶ The tobacco leaves were ground in a wooden mortar and pestle. When first brought to Europe in the late 15th century, snuff was used dry and inhaled through the nose.⁶ Although smokeless tobacco was widely used until the 19th century, its consumption in Canada has dropped dramatically since the early 20th century: from 3,210 tonnes in 1920¹² to 266 tonnes in 2013.¹³ Modern snuff is available in dry or moist forms; the moist form is also known as dipping tobacco.^{6,7} The powdered or shredded tobacco is mixed with other ingredients, which usually includes flavourings. As with chewing tobacco, most moist snuff is fermented. Moist snuff is not inhaled but is held in the mouth between the cheek or lip and gum.¹⁴ Users place a pinch of snuff in their mouths, and the nicotine is absorbed through the cells in the mouth.

Snus, which originated in Sweden, is somewhat different. It is not fermented and is cured using steam, rather than fire, which is used for other types of moist snuff.¹⁵

Two products that have been developed recently are dissolvable tobacco and nicotine gum. The strips, orbs or sticks of dissolvable tobacco are held in the mouth as they slowly disintegrate.⁹ The commercial nicotine gum is similar to the nicotine gum used as a nicotine replacement therapy (NRT), although it isn't as strong as the NRT gum.¹⁶ The major difference is that the intent of the NRT gum is to reduce someone's dependence on nicotine by gradually decreasing the frequency of use, whereas the commercial gum can reinforce the nicotine dependence because users can chew it whenever they want. As of 2014, these products have limited distribution in test markets in the United States.^{9,16}

Dangers

In addition to nicotine, smokeless tobacco contains over 3,000 chemicals,¹⁷ including 28 known carcinogens (cancer-causing compounds).¹⁸ The nicotine content in smokeless tobacco varies widely from product to product, and absorption can vary with the amount used, the length of time the product is held in the mouth, and the pH levels of the product and the user's mouth.^{18,19} The amount of nicotine absorbed when using smokeless tobacco is two to three times the amount that someone gets from a cigarette. A person who consumes eight to 10 dips or chews per day receives the same amount of nicotine as someone who smokes 30 to 40 cigarettes per day.¹⁷ The average cigarette contains 8.4 mg of nicotine while an average "dip" of moist snuff has 14.5 mg of nicotine, meaning someone using chewing tobacco can be exposed to as much as 133 mg of nicotine in a day.¹⁸

Several carcinogens have been identified in smokeless tobacco; the tobacco-specific N-nitrosamines (TSNAs), N-nitrosornicotine and 4-(N-methyl-N-nitrosamino)-1-(3-pyridyl)-l-butanone, are the most important.²⁰ Other cancer-causing substances in smokeless tobacco include formaldehyde, acetaldehyde, arsenic, nickel, cadmium and benzopyrene.³ The TSNAs are formed from nicotine during the curing, fermenting and aging of smokeless tobacco.^{3,21} The concentration of TSNAs is higher in snuff than in other smokeless tobacco products.^{20,21}

According to several studies, the three leading snuff brands in the United States (which make up 92% of the U.S. market) contain far higher concentrations of nicotine and TSNAs than the less popular brands.²⁰ Analysis of snus has shown that, because steam is used to cure the tobacco rather than the fire-curing process for other forms of snuff, the tobacco contains less TSNAs.¹⁵

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Health Concerns

People who are addicted to smokeless tobacco often use it for many years, and this can lead to serious health problems, which include

- gum recession (the gums pulling away from the teeth) and loss of bone in the jaw
- tooth abrasion (worn spots on the teeth)
- yellowing of teeth
- chronic bad breath
- gum and tooth disease, leading to cavities, lost teeth and painful sores
- leukoplakia (white, leathery, pre-cancerous patches that may develop where tobacco is held in the mouth, such as the cheeks, gums or tongue, and may become cancerous)
- cancer of the mouth (including the lip, tongue, inner cheek, and floor and roof of the mouth) and throat
- cardiovascular problems such as high blood pressure, heart disease and stroke^{8,10,18,21,23-26}

The inflammation, gum recession, and tooth damage caused by smokeless tobacco, whether chewed or inhaled, can be extensive and life threatening in some cases. The additives in smokeless tobacco products can scratch teeth and wear away tooth enamel. Gum recession, especially in the spot where the tobacco is usually placed, exposes root surfaces; this makes teeth more sensitive to heat and cold.²⁷⁻²⁹ The risks of oral cancer and periodontal disease decline as time after cessation increases, and some oral mucosal lesions may resolve with cessation of smokeless tobacco use.³⁰

People who use chewing tobacco and snuff have an increased risk of developing oral cancer.^{11,20,31} In 2012, there were 378 new cases and 109 deaths from oral cancer in Alberta;³² estimates for Canada in 2012 were 4,050 new cases and 1,160

deaths.³³ Surgery to treat oral cancer may involve removing parts of the face, tongue, cheek or lip and can be disfiguring.³⁴ About one-third of all oral cancer cases are fatal.²⁵

A link between smokeless tobacco use and cancer of the pancreas has also been reported.³⁵⁻³⁷ Higher levels of TSNAs have been found in the pancreatic secretions of tobacco users than of non-tobacco users; these chemicals are suspected to be the link between smokeless tobacco use and pancreatic cancer.

The nicotine in smokeless tobacco also affects the heart by increasing heart rate and blood pressure,^{10,38-41} which increases risk for stroke, coronary heart disease, peripheral vascular disease (that is, diseases of the arteries and veins) and heart attacks.^{23,42,43} However, it should be noted that some studies have shown no relation between smokeless tobacco use and stroke or cardiovascular mortality.^{44,45} Further rigorous studies are needed to determine more clearly the cardiovascular and non-oral cancer risks potentially associated with smokeless tobacco use.^{20,46}

Smokeless tobacco is commonly used by athletes because of a mistaken belief that it enhances their performance. A 1997 U.S. study showed that an estimated 23% of college athletes (male and female) in the U.S. used smokeless tobacco, including both chewing tobacco and snuff.⁴⁷ In a survey of 754 Canadian university athletes, 25% of males reported that they used smokeless tobacco. Sports that had a high incidence of smokeless tobacco use included football (36%) and hockey (47%).⁴⁸ A 2005 survey reported that 36% of professional baseball players and 25% of minor league baseball players used smokeless tobacco.⁴⁹

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Research indicates that smokeless tobacco use does not improve⁵⁰⁻⁵² and may even hinder athletic performance. Use of smokeless tobacco does not improve reaction time in athletes⁵⁰⁻⁵² and is associated with decreased physical activity.^{53,54}

Regulation

Some tobacco control strategists believe that encouraging a shift toward smokeless tobacco use can be an effective harm reduction approach. Their rationale is that these products may reduce total tobacco-caused death and disease, because tobacco smoke contains more potentially harmful constituents.⁵⁵ WHO's Scientific Advisory Committee on Tobacco Products Regulation raises a cautionary note in this regard. In the committee's assessment, current evidence indicates that use of smokeless tobacco has health risks that do not warrant its use for harm reduction.⁵⁶

The major concern by those opposed to smokeless tobacco as a harm-reduction strategy is that promoting one tobacco product as less harmful than another may undermine efforts to achieve total tobacco cessation or may foster smoking initiation among people who otherwise would not have started.⁵⁷

The relationship between smokeless tobacco use and smoking is difficult to ascertain. Although some studies find that smokeless tobacco use is more likely to precede smoking,^{57,58} it is more commonly found that smoking precedes smokeless tobacco use.⁵⁹ In addition, marketers for the smokeless tobacco companies have encouraged people who smoke to use smokeless tobacco in situations where smoking is either discouraged or not permitted.⁶⁰

Although some people may use smokeless products to quit smoking, a study showed that U.S. men more commonly switch from using smokeless tobacco to smoking. Nearly half of men who used smokeless tobacco on some days currently smoked, and those who currently smoked only on some days were more likely than those who had never smoked to be current smokeless users. Men who smoked and used snuff every day tended to smoke fewer cigarettes, again suggesting that snuff may serve as a supplementary source of nicotine. Also, those who smoked and also used snuff were more likely than non-users of snuff to try to quit smoking but tended to be less successful.⁵⁷

Cessation

Therapies and programs for smokeless cessation have generally been adapted from successful smoking cessation methods; however, some of the challenges that smokeless tobacco cessation poses are unique and should be considered in any quit attempt. Some of these challenges are

- the presence of oral lesions can be irritated by nicotine gum (estimates suggest that over 50% of users have some degree of oral lesion)
- a strong need for an oral substitute during withdrawal
- the perception that smokeless tobacco is not a harmful tobacco product (users sometimes have less motivation to quit as a result)
- difficulty that users experience in gradually reducing their nicotine intake because the amount and length exposure of smokeless tobacco are specific to each individual
- many smokeless tobacco users also smoke, so attempts to reduce both are more difficult than either by themselves⁶¹

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With regard to cessation, smokeless tobacco users display several similarities to those who smoke. They report essentially equivalent levels of nicotine exposure, nicotine dependence, craving, and difficulty in stopping tobacco use.⁶²

Recent evidence also suggests that smokeless tobacco users and those who smoke experience similar levels of withdrawal severity upon quitting.⁶³ There is evidence to suggest that, as with people who smoke, most smokeless tobacco users want to quit but are generally unsuccessful in their attempts to do so.⁶²

In a 2004 review of several studies examining cessation of smokeless tobacco use, there was no indication of benefits of using pharmacotherapy

including bupropion, a nicotine patch, or nicotine gum. However, it was suggested that larger trials investigating pharmacotherapy are needed. Research in the area of smokeless tobacco cessation is limited, but seems to suggest that a combination of therapies offers the greatest hope for success.⁶⁴

Alberta Health Services provides tobacco cessation support through the AlbertaQuits Helpline (1-866-710-QUIT (7848))—a free, confidential counselling telephone service that offers evidence-based information and support to quit using tobacco. Callers can access help developing an individual quit plan, receive information or be referred to services available in their community.

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