Smokeless Tobacco: Current Trends and Future Implications

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The use of smokeless tobacco (ST) has soared in the United States in the past 25 years and usage rates have tripled between 1975 and 1991. The largest percentage of users are between 18 and 25 years of age.

The 1993 Youth Risk Behavior Survey reports that 11.5% of high school students had used ST in the previous month. Among college students, the use of ST by athletes is much higher than for non-athletes. There have been few studies to determine usage rates among high school athletes.

The most popular type of ST is snuff, which is far more carcinogenic and addictive than other ST products. In view of the increasing use of ST among athletes, it is imperative that athletic trainers, coaches, physicians, and administrators become proactive in addressing the problem.

History

Smokeless tobacco originated with Native Americans. In the 1800s it was so popular and accepted that some people believed the national emblem should be the spittoon rather than the eagle (Glover et al., 1988). During the 19th century, snuff was believed to have medicinal benefits such as the ability to prevent plague, cure toothaches, stomachaches, and skin disorders, eliminate muscle spasms, and even kill insects.

The use of ST declined when it was believed there was a link between spitting and the spread of tuberculosis. During this time baseball players were using ST to keep their mouths moist and to soften their gloves. Later they used it for spitballs. Despite the concern about tuberculosis, players continued to use ST until it was banned in 1920.

By the 1950s, cigarette smoking far outweighed all other uses of tobacco, and ST use was virtually nonexistent. In 1970 there was a resurgence of the use of ST in America, with a preference for moist snuff. By the mid-1980s, estimates of usage ranged from 7 to 12 million. ST sales have continued to grow throughout the '80s and '90s, particularly for moist snuff (see Table 1).

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Pounds of Smokeless Tobacco Produced</th>
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</thead>
<tbody>
<tr>
<td>Chew</td>
<td>71.8 m</td>
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<tr>
<td>Snuff</td>
<td>50.5 m</td>
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</tbody>
</table>

Source: Dept. of the Treasury, January 1996.

Types of Smokeless Tobacco

The three most popular types of ST are plug, loose leaf (chew), and snuff. Plug is tobacco leaves pressed into bricks or cakes. Chew is loose leaf, shredded tobacco. Both types of tobacco have a molasses component and are chewed by sucking on a golf-ball-size wad or quid.

Snuff is finely ground tobacco. Dry snuff can be sniffed through the nostrils. More commonly in America, moist snuff is “dipped” by placing a pinch between the lower lip and gum. Moist snuff also comes in small tea-bag-like pouches that can be held in the mouth.

There is varying sugar content in each type of tobacco: plug, 2%; chew, 24%; moist snuff, 36%. Chemical analysis of various types of ST revealed the presence of 28 types of carcinogens including...
nitrosamines, polonium-210, and polynuclear aromatic hydrocarbons (Brunnemann & Hoffman, 1991). Glover reported that dip or snuff delivers the same amount of nicotine as cigarettes and 10 times the nitrosamines.

Chewing tobacco and moist snuff are rendered carcinogenic primarily by the nitrosamines. Snuff has the highest concentration of nitrosamine, reaching 2,000 to 80,000 parts per billion (ppb). By contrast, the Food and Drug Administration (FDA) and the U.S. Department of Agriculture (USDA) recommend no more than 5 to 10 ppb of nitrosamine in preservatives used for curing meat and making beer.

Smokeless tobacco does not fall under FDA or USDA regulations but instead is regulated by the Bureau of Alcohol, Tobacco, and Firearms. Brands of snuff with the highest nitrosamine content include Red Man (100,000 ppb), Skoal (22,300 ppb), and Copenhagen (20,600 ppb) (Brunnemann & Hoffman, 1991).

Benowitz (1991) claimed that each pinch of snuff has the equivalent nicotine content of 2 cigarettes. The nicotine content varies in different brands of moist snuff: Red Man and Copenhagen, over 30 mg/g; Kodiak, 14.6 mg/g; Skoal, 10.7 mg/g; Hawken, 5.7 mg/g; Bandits, less than 5 mg/g.

Short- and Long-Term Effects

As nicotine enters the bloodstream, the blood vessels constrict; this causes blood pressure to increase (7–21 mg Hg) and heart rate to speed up to 19 bpm faster (Westman, 1995). Despite claims by athletes, no studies have found any improvement in psychomotor performance from smokeless tobacco.

Landers et al. (1992) did find that performance on cognitively demanding tasks such as math tests was better for users than for nonusers. Users reported a quicker "buzz" from ST than from smoking. This is due to the rapid absorption of nicotine through the buccal membranes of the mouth.

Long-term health effects of ST include receding gums, stained teeth, cavities, abrasion/erosion of teeth, oral cancer, addiction, cardiovascular disease, and leukoplakia (ST keratosis).

Leukoplakia appears as a wrinkled, thickened, and white leathery area in the mouth. If ST use is continued for 3 years after a lesion appears, cancer is very likely to develop (Cassissi, 1996). Grady et al. (1990) and Wisniewski (1990) found a significant positive correlation between risk for oral leukoplakia and the number of hours ST is held in the mouth, recency of last use, and type and brand of ST used. For example, users of Skoal and Copenhagen were 4 to 6 times more likely to have leukoplakia.

Why the Increase in Usage?

The re-emergence of ST use has been attributed to advertising campaigns by tobacco companies advocating ST as a safe alternative to cigarette smoking. The advertisements featured sports heroes, cowboys, and celebrities to downplay the unsavory image of the early 1900s and to link chewing and dipping with strong, healthy, athletic role models.

The strategy worked, and by the early 1980s ST sales were at the highest point ever. There was a slight downturn in sales in the early 1990s. This was thought to be due to the publicity surrounding the death of an Oklahoma baseball player, Sean Marcie, who had chewed tobacco since the age of 12. He was diagnosed with oral cancer at age 18 and died 9 months later shortly after his third surgery.

In 1986 the Comprehensive Smokeless Tobacco Education Act was passed. It called for the development of health education programs and elimination of all electronic media advertising (billboards, newspaper, and magazine advertising were still allowed). The Act also called for 1 of 3 warning labels to be placed on all products:

1. This product may cause mouth cancer.
2. This product may cause gum disease and tooth loss.
3. This product is not a safe alternative to cigarettes.

Three years ago the Federal Trade Commission mandated that any merchandise used for advertising must also have warning labels (e.g., T-shirts, hats), but this mandate has not been strictly enforced.

The Surgeon General’s Report (U.S. Dept. of HHS, 1996) indicates that tobacco companies have increased their sales by using starter products (e.g., tea-bag-like pouches called Bandits). They also expose young males to progressively more addictive products through advertising, sponsoring athletic events, and offering free samples.