BEYOND THE abc's

INFORMATION FOR PROFESSIONALS

Tobacco

Introduction

Nicotine, present in the tobacco leaf, is one of the main ingredients in tobacco. It is a central nervous system stimulant and is classified as a drug. Tobacco leaves can be burned and inhaled (in the form of cigarettes, cigars, pipe smoke, bidis, etc.) or absorbed (in the form of spit tobacco or snuff). The membranes in the nose and mouth and the lungs act as nicotine delivery systems.

In higher doses, nicotine is extremely poisonous. (It is commonly used as an insecticide.) Smokers typically feel dizzy and sick when they first inhale the nicotine in tobacco smoke. But their bodies adjust and users gradually build up a tolerance to the effects of nicotine in both smoking tobacco and spit tobacco.

Nicotine is also highly addictive. A 1988 Surgeon General's report concluded that nicotine in all forms of tobacco causes addiction. The report also concluded that nicotine is as physically addictive as cocaine or heroin. The addictive effect of nicotine is the main reason why tobacco is widely used.

Overall, 33 to 50 per cent of people who experiment with tobacco become regular users. Seventy to 90 per cent of people who are regular users are addicted to nicotine. In comparison, 77 per cent of Albertans use alcohol, but the addiction rate is estimated to be about 2.7 per cent.

How nicotine works

The nicotine in tobacco products is quickly absorbed into the bloodstream. In the brain, nicotine causes biological and chemical changes. It interferes with the balance of neurotransmitters such as dopamine, endorphins, epinephrine and, in particular, acetylcholine.

Acetylcholine is a chemical that carries information across the space between nerve cells. It affects blood pressure, sleeping patterns, memory, aggression, sexual activity and mental functioning. Nicotine mimics acetylcholine by slotting into nicotinic acetylcholine receptor sites. Nicotine exaggerates the normal (cholinergic) effects of acetylcholine. The tobacco user may experience feelings of calm and well-being, a greater ability to concentrate, feelings of relaxation, and, for a short while, a decreased urge to smoke.

For more information, contact your local AADAC office, or call **1-866-33AADAC**, or visit our Web site **www.aadac.com**.

AADAC Alberta Alcohol and Drug Abuse Commission
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Short-Term effects

New smokers may experience coughing, dizziness and a dry, irritated throat. Other effects may include nausea, weakness, abdominal cramps, headache, coughing or gagging. These symptoms abate as the user develops a tolerance to nicotine.

Physiological reactions include an increase in blood pressure and heart rate, and constriction of blood vessels, causing lower skin temperature in hands and feet. Users may also report decreased appetite.

Long-Term effects

Tobacco is the major preventable risk factor for chronic respiratory diseases. The nicotine, tar and carbon monoxide in smoking tobacco damage the cardiovascular and respiratory systems. Long-term effects of tobacco use include heart disease, strokes, emphysema, chronic bronchitis, and aneurysms. As well, smoking tobacco increases the risk of lung and oral cancers.

Male smokers are twice as likely to experience impotence (erectile dysfunction) as male non-smokers. Smoking affects the nervous system, hormones and vascular system. These systems work together with the muscle tissue to maintain an erection.

Spit tobacco contains more than 3,000 chemicals, including about 28 known carcinogens. Like smoking tobacco, spit tobacco affects the cardiovascular system and may be associated with heart disease, stroke and high blood pressure. Long-term effects include leukoplakia, tooth abrasion, gum recession, gum and tooth disease, loss of bone in the jaw, yellowing of teeth and chronic bad breath.

Other health consequences of using spit tobacco include cancer of the mouth (including the lip, tongue, cheek and floor and roof of the mouth) and throat.

Nicotine and addiction

Nicotine is considered addictive because it alters brain functioning and because people use it compulsively. Addiction to tobacco is not immediate — it may take weeks or months to develop. Most users don't find their first experiences with tobacco pleasant. Social pressure and other factors may be required to maintain the level of exposure needed for addiction to develop.

Nicotine is a "reinforcing" drug — users desire the drug regardless of the damaging effects. Nicotine is a reinforcer because it causes many smokers to continue to smoke in order to avoid the pain of withdrawal symptoms. Smokers also adjust their smoking behaviour (inhaling more deeply, for example) to keep a certain level of nicotine in the body.

Here's how nicotine works as a reinforcer. More acetylcholine receptors are created in the brain of a tobacco user, particularly nicotinic receptors. When a tobacco user tries to stop, the activity of acetylcholine is greatly exaggerated by all the extra receptors, which makes the user feel irritable and restless. The tobacco user soon comes to depend on the nicotine to feel "normal," that is, to avoid withdrawal symptoms. A 1998 study has shown that when nicotine is withheld, there is a significant decrease in the brain's reward function. This effect can last for days.

Heavy users have great difficulty in stopping. Research suggests there is a strong link between age of onset of smoking and nicotine dependence. Individuals who begin smoking when they are teens, especially young teens, tend to be more dependent than persons who start smoking after age 20.

Stopping is difficult and made even more difficult by the fact that users may not experience the consequences until many years after first use. Unlike cocaine, heroin or alcohol abuse, the more dangerous effects of use are not obvious in the beginning. As well, the pleasurable effects of tobacco use may outweigh the abstract possibility of future health consequences in the minds of many smokers.

Withdrawal

Smokers who usually smoke at least 15 cigarettes per day and/or smoke their first cigarette of the day within 30 minutes of waking are likely to experience nicotine withdrawal symptoms. They will likely find quitting uncomfortable.

Withdrawal symptoms include depression, insomnia, irritability, anxiety, difficulty concentrating, restless-

ness, decreased heart rate, increased appetite, weight gain and craving for nicotine. Symptoms peak from 24 to 48 hours after stopping and can last from three days up to four weeks, although the craving for a cigarette can last for months.

Most smokers make an average of three or four quit attempts before becoming long-term non-smokers. Relapse is the rule rather than the exception and must be viewed as part of the process of quitting.

Treatment

Nicotine replacement therapies (NRTs) offer promise in treating nicotine addiction, especially when used along with support programs and/or counselling. NRTs include nicotine gum such as Nicorette®, Nicorette Plus®, and Nicotine patches such as Nicotrol®, Nicoderm Patch® and Habitrol®.

The research proves that NRTs double the chances of long-term cessation. That success increases when NRTs are used with strong support or behaviour modification available through help-line, self-help and quit group programs.

Tobacco and society

Alberta's smoking prevalence rates (27.6 per cent current smokers) are higher than Canadian rates (25.9 per cent current smokers). Current smokers are made up of those who smoke either daily (at least one cigarette a day) or occasionally (at least one cigarette a month). In Alberta, four out of five current smokers are in fact daily smokers (22.9 per cent out of 27 per cent). The remainder, one out of five, are occasional smokers (4.7 per cent out of 27.6 per cent). The spit tobacco experimentation rate among teens in Alberta is double the national average (20 per cent for chewing tobacco/moist snuff and 7% for dry snuff).

The economic costs of tobacco use are high despite revenues from tobacco taxes. The estimated revenue from tobacco taxes in 1991 was $7.8 billion. While Canadian smokers "paid their way" for health care related costs ($2.7 billion in 1992), the estimated costs to society as a whole are far greater. Canadians are forced to absorb costs from worker absenteeism, fires and lost income due to premature death.

Using 1992 data, the Canadian Centre on Substance Abuse estimated the total cost for Canada at $9.5 billion annually. (Other research, using 1991 data, has put that estimate as high as $15 billion annually.) The centre reported Albertans' tobacco use (in 1992) cost the Alberta economy an estimated $728.6 million. The report cited the expense related to health care, reduced productivity, lost income, increased absenteeism, the set-up and maintenance of smoking areas and fire-related property damage.

These estimates of tobacco-related costs would be substantially higher in 2002. For example, the 36,125 fires set by smokers' materials cost Canadians $433 million in property damage (to homes and vehicles) over a 10-year period (1988-1997). In Alberta, between 1988 and 1997, the 4,841 fires related to smoker's materials cost Albertans $56 million in property damage.

The individual cost to a smoker's health and well-being is enormous, but financial costs are high as well. Because smokers have more health problems and a higher mortality rate, they pay higher life insurance premiums. In Alberta, a smoker who smokes a pack a day spends almost $3,300 each year on cigarettes (based on an average price of $9 per pack).

By buying cigarettes, smokers contribute billions of dollars in taxes that non-smokers don't.

Tobacco and the law

The modern era of federal tobacco control legislation began in 1988 with the passage of the *Tobacco Products Control Act*. The act banned traditional forms of tobacco advertising. The tobacco industry immediately launched a constitutional court challenge. In 1995, after the case worked its way through the justice system, the Supreme Court struck down key components of the legislation. But the court also ruled that some restrictions on tobacco advertising were justified, including banning lifestyle advertising. In developing new tobacco legislation, the government followed the court ruling and banned tobacco advertising or promotion anywhere youth is an audience: billboards, television and print publications.

In 1997, Bill C-71, the *Tobacco Act*, became law.

The *Tobacco Act* regulates the manufacture, distribution, advertising, possession and consumption of tobacco. Although tobacco is a legal substance, it is an offence to sell tobacco products to anyone under the age of 18. According to the 2001 *Canadian Tobacco Use Monitoring Survey* (CTUMS), 42 per cent of Alberta youth (15-18 years old) reported buying cigarettes from small corner stores or vending machines. As well, 25 per cent reported buying cigarettes from the supermarket and another 25 per cent from drug stores and gas stations. When asked if anyone had inquired about their age when making the purchase, 28 per cent of Alberta youth said no.

Municipalities throughout Canada have been passing and strengthening bylaws that provide the public with an ever-increasing number of smoke-free public places.

In 2001, the Minister of Alberta Health and Wellness established an interdepartmental committee to develop a plan to reduce tobacco use in Alberta. The ministries of Aboriginal Affairs and Northern Development, Children's Services, Human Resources and Employment, Justice, Learning, Municipal Affairs, Health and Wellness, and the Alberta Alcohol and Drug Abuse Commission (AADAC) gave input. In 2002, Alberta Health and Wellness released Reducing Tobacco Use in Alberta: A Comprehensive Strategy. The Alberta Tobacco Reduction Strategy calls for a comprehensive approach and funding of $11.7 million. AADAC will spend $8.7 million of this on education and cessation activities.

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