

# The Addiction of Tobacco



Despite the growing societal restrictions on tobacco use, adults have a legal right to buy and use tobacco, just as they have the legal right to buy and use alcohol. Although only a small number of alcohol drinkers develop dependence or addiction problems, alcohol is known to be a potentially dangerous drug, and society accepts it as such. It is known that alcohol dependence or addiction leads to serious

disruptions in the ability to live and work, can cause serious medical and mental problems, and is potentially lethal. Alcohol is listed as the cause of several disorders in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (DSM-IV-TR).

On the other hand, society is just beginning to acknowledge that that other legal drug (tobacco) is also dangerous. Unlike alcohol and illicit drugs, tobacco is perceived to cause minimal disruption to cognitive or behavioral function of the user, so tobacco use was tolerated for centuries in just about every setting. It is increasingly obvious, however, that tobacco use causes severe health problems for users and those who are exposed to secondhand smoke. Many states are passing legislation to create smoke-free work environments (and of course, minors cannot legally obtain tobacco products) but little else has changed about tobacco use in this country. The prevailing social attitude of, "If you have to smoke, do it where it doesn't hurt anyone but you," is changing as people and institutions become less tolerant about tobacco use. Encouraging friends and loved ones to quit smoking is the vogue. Along with that must come an understanding that nicotine addiction is a powerful addiction that is difficult to overcome. Interestingly, the DSM-IV-TR has included nicotine-related disorders in its list of mental disorders since 1994.

## What Is an Addiction?

Addiction is a compulsive craving for and seeking out of a substance or activity even though the addict knows that the substance or activity is harmful. For instance, most tobacco users acknowledge that tobacco is harmful to their health and most express a desire to quit. Almost 35 million tobacco users attempt to quit every year but only about 6% are successful for more than a month. Addiction is never satisfied. Even attaining the desired substance (such as alcohol) or activity (such as gambling) only quiets the need temporarily. The cravings are constant and usually progressive because the addict seeks relief more and more often or in larger quantities. The cravings are more than psychological; the body and brain actually change to accommodate the new substance.

## Why Is Tobacco Addictive?

Nicotine is present in every form of tobacco as a natural insecticide. This means that bugs don't feed on tobacco plants because the nicotine tastes awful and kills them. It is a toxic substance that is more deadly drop for drop than strychnine or rattlesnake venom. Nicotine in processed tobacco is still lethal—if eaten in large enough quantities. For example, users of nicotine replacement products such as nicotine gum are warned to wrap and discard used gum in containers where children and pets do not have access.

Nicotine delivered into the blood through tobacco produces a mind-altering "high." Smoked tobacco delivers 1 to 2 mg of nicotine per cigarette, and it reaches the brain in under ten seconds. Pipe, cigar, and smokeless tobacco users receive most nicotine through the moist linings of their mouth, reaching the brain a bit more slowly. However, smokeless tobacco users can maintain the "high" by the almost continuous presence of tobacco in the mouth.

# The Addiction of Tobacco, cont.

## Why Is Tobacco Addictive?, cont.

Nicotine (and other addictive substances in tobacco) cause actual physical changes in the brain and other related body organs.

- Nicotine stimulates the adrenal glands, causing them to discharge adrenaline. The adrenaline rush stimulates the body. Blood pressure, respiration, heart rate and glucose levels increase immediately.
- Nicotine suppresses insulin output from the pancreas. Insulin is needed to moderate the amount of sugar produced by the liver. Most tobacco users are always slightly hyperglycemic (they have elevated blood sugar).
- Nicotine activates brain circuitry that regulates feelings of pleasure by increasing the level of dopamine in the brain's "reward" circuits. The high levels of dopamine are extremely pleasurable and maintaining those high levels becomes the "reward."
- Cigarette smoking seems to cause a marked decrease in the levels of monoamine oxidase (MAO). MAO is an important enzyme that breaks down dopamine. Nicotine does not have this effect on MAO levels, so researchers are looking at other tobacco components.
- Acetaldehyde, another chemical component of tobacco smoke, dramatically increases the potency of nicotine reactions in the brain, thereby increasing the addictive quality of nicotine.
- Nicotine's chemical structure is almost identical to the neurotransmitter acetylcholine. Inside the brain, nicotine fits in a large number of chemical locks, giving it control over the flow of more than 200 neurochemicals.
- In an effort to adjust and feel "normal," the brain will actually alter its physical neuro-circuitry to meet the changed chemical onslaughts of nicotine, dopamine, adrenaline, acetaldehyde, etc. The number of neuro-receptors and transporters available to receive nicotine will diminish. Extra acetylcholine receptors will develop. The new sense of "normal" depends upon the presence of nicotine. Withdrawal from nicotine upsets the delicate balance. The dopamine and adrenaline levels are all wrong, and the brain signals depression and anxiety. Return to "normalcy" now depends on nicotine intake.

Addiction is also psychological, meaning that the mind changes thought and behavior patterns to accommodate the addictive substance or behavior. Daily routines for a tobacco user are much different than that of a non-user. Opportunities to use tobacco must be built into the day. Certain activities trigger the need to use tobacco, as the user becomes habituated to a smoke after a meal or while talking on the phone, etc. Disruptions to the routine are unpleasant.

The good news about the psychological part of the addiction is that the mind can actually over-ride the brain and body. The mind is the conscious, learning, rational part of the self, which has ultimate control. Once the tobacco user decides to quit smoking, he or she has begun to gain some control over the addiction. All addicts have the opportunity to quit. Most need help. Many can be successful. Most states have smoking cessation programs. In South Dakota, the program is the free South Dakota QuitLine. The toll free number is 1-866-SD QUIT (1-866-737-8487). The South Dakota QuitLine can help with information, coaching, discounts on nicotine withdrawal products, and free professional advice.

For more information on tobacco use and addiction, please visit:  
<http://www.nida.nih.gov/ResearchReports/Nicotine/nicotine2.html#addictive>  
<http://www.quit tobacco.com/facts/effects.htm>  
<http://whyquit.com/whyquit/LinksAAddiction.html>