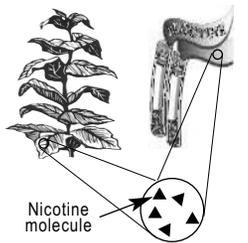


How Does Nicotine Addiction Happen

What follows is a scientific summary of nicotine addiction. If science is not your thing, skip to the bottom to read the information in the “Nicotine Addiction in Plain English” box.

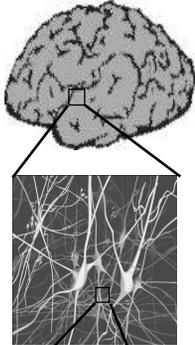


Tobacco leaves contain nicotine, and when they burn, the nicotine is released

Nicotine occurs naturally in tobacco leaves. When a person lights a cigarette, the tobacco leaves and other added compounds reach 900°C and gases and particles are released. The particles are seen as smoke, and the sum total of these particles is called tar. Over 4,000 compounds have been identified in the tar and gases released from burning tobacco. About 40 of these compounds are known to cause cancer. Nicotine itself does not cause cancer and is relatively harmless to health in the amounts found in cigarettes. However, it is the only compound that keeps a person coming back to tobacco.

Inhaled cigarette smoke contains nicotine that quickly reaches the brain via the lungs

When a person inhales, nicotine from the burning tobacco enters the lungs, is absorbed into the bloodstream, and is transported to the brain. The nicotine leaves the bloodstream and “bathes” the cells of the brain.

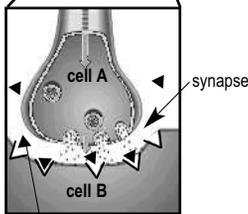


Brain cells communicate with each other through neurotransmitters and receptors

At this point, a brief review of how nerve cells communicate is needed to fully understand nicotine addiction. Nerve cells, such as those in the brain, do not actually touch each other. They are separated by a small space called a synapse. In order for a message (an electrical current) to be transmitted from nerve cell A to nerve cell B, neurotransmitters from cell A are released into the synapse and they bind to **specific** receptors on cell B. When enough receptors are filled, an electrical current begins in cell B that continues to the end of that cell where it meets cell C, and more neurotransmitters are released from cell B which bind to the receptors on cell C and the message continues.

Nicotine overpowers receptors in an area of the brain that is responsible for feelings of pleasure and reward

The nicotine molecule has a shape that fits perfectly into the receptors on nerve cells in the pleasure/reward center of the brain. These receptors are not meant to accept nicotine. When a person uses tobacco, a large number of nicotine molecules reach the brain, bind to these receptors and spark a message in the pleasure/reward center of the brain, where there wasn't one before. This stimulation of the pleasure center is felt by the tobacco user as pleasurable.



The body breaks down nicotine; levels in the blood and brain drop; and the brain becomes “unhappy”

The body recognizes nicotine as a foreign substance. The liver breaks down nicotine that is circulating in the blood into compounds that are eliminated in the urine. The moment a person puts out a cigarette, the level of nicotine in the blood (and the brain) begins to decrease. This results in a decrease in the stimulation of the pleasure/reward center of the brain and the person begins to experience negative emotions such as irritability, anxiety, and sadness. Of course, the smoker doesn't enjoy this negative state of mind, so as it builds s/he reaches for a cigarette, takes a few puffs and the pleasure center is stimulated again. These negative emotions are relieved for a short period, until nicotine levels drop again after the cigarette is put out. It is important to note that once this vicious cycle has begun, the smoker does not smoke to create pleasure; rather, s/he smokes to relieve negative emotions. **Smoking does not create a “high”; it temporarily removes a low!!!**

Nicotine “sneaking” into receptor



Nicotine Addiction in Plain English

Nicotine in tobacco smoke gets into your lungs and then your brain, where it stimulates the pleasure/reward center. After you have finished a cigarette, the amount of nicotine in the brain drops and you begin to experience negative emotions. When you get another “hit” of nicotine by having another cigarette, bad feelings disappear (momentarily) as the pleasure/reward center is stimulated again. But nicotine levels drop once more, negative emotions return and the cycle of smoking continues to relieve these emotions.