

# SMOKING AND VAPING ADDICTION



# FACTS AND FIGURES

Smoking and Vaping

# **SMOKING AND VAPING ADDICTION**

## **CIGARETTES AND TOBACCO PRODUCTS**

The Predatory Drug

## **DEADLY VAPING ADDITIVES**

CBD, THC, and Contaminants

## **FACTS AND FIGURES**

Smoking and Vaping

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Big Business for Young Clientele

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Finding the Strength in You

## **VAPING**

The New Cool Way to a Shorter Life

**SMOKING AND VAPING ADDICTION**

# **FACTS AND FIGURES**

**Smoking and Vaping**

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## KEY ICONS TO LOOK FOR:



**Words to Understand:** These words with their easy-to-understand definitions will increase the reader’s understanding of the text while building vocabulary skills.



**Sidebars:** This boxed material within the main text allows readers to build knowledge, gain insights, explore possibilities, and broaden their perspectives by weaving together additional information to provide realistic and holistic perspectives.



**Educational videos:** Readers can view videos by scanning our QR codes, providing them with additional educational content to supplement the text. Examples include news coverage, moments in history, speeches, iconic sports moments, and much more!



**Text-Dependent Questions:** These questions send the reader back to the text for more careful attention to the evidence presented there.



**Research Projects:** Readers are pointed toward areas of further inquiry connected to each chapter. Suggestions are provided for projects that encourage deeper research and analysis.



**Series Glossary of Key Terms:** This back-of-the-book glossary contains terminology used throughout this series. Words found here increase the reader’s ability to read and comprehend higher-level books and articles in this field.



*Cigarettes, electronic vapor devices, and other products that contain nicotine can cause serious health effects such as lung cancer and heart disease.*



## WORDS TO UNDERSTAND

**arduous:** referring to something that is difficult, requiring hard work

**cessation:** bringing something to an end, such as nicotine use

**dependency:** a state in which a person's body relies on a drug or other substance to feel healthy

**hormone:** a chemical produced in the human body that stimulates actions in the body or brain.

**neurotransmitter:** a chemical that carries messages between nerve cells in the brain and central nervous system.

**psychosocial:** related to the interaction between individuals and social groups

# The Addictive Effects of Nicotine

Nicotine is one of the most devastating drugs, in spite of its legal status. Every year, nearly half a million people in the United States alone die from using tobacco products—and this is during a period in which nicotine use is at its lowest level in a century. Until relatively recently, nearly half of all Americans smoked or used chewing tobacco, and millions of people died from the resulting health problems like cancer and lung disease.

Beyond the statistics on nicotine and tobacco use, it is important to understand how use of this drug leads to addiction in users. This fact is crucial because it helps to explain why people use tobacco products despite the well-known health dangers. Beating nicotine is often an **arduous** task for many because of the unique demands that it puts on a user and the more socially accepted nature that it has in many cultures.

For example, cigarette smoking is much more common in many European countries than it currently is in the United States. This impact can be widespread and devastating in many ways: for example, the high death rate of the coronavirus in Italy during the spring of 2020 was likely due to the heavier abuse of cigarettes in that country. That is just one of the many ways that tobacco and nicotine use can cause damage in unexpected ways.



*In 2019 the US Food and Drug Administration proposed new graphic health warnings for cigarette packages and advertisements, intended to help the public better understand the negative health consequences of using nicotine products.*

Anybody who smokes or uses nicotine products needs to understand why they may have difficulty quitting, even though they want to stop. Just as importantly, they need to know that they aren't alone in this situation. Millions of people around the nation are currently fighting with nicotine addiction and losing the battle. Sadly, they may end up part of the unfortunate statistics if they don't take the time to treat their addiction properly, as they would any other substance-abuse disorder.

## NICOTINE PRODUCES MANY ADDICTIVE EFFECTS

The addictive nature of nicotine and tobacco has been heavily studied and confirmed over the years. Any smoker or vaper probably doesn't need a doctor to tell them that nicotine **dependency** is real. However, knowing how nicotine produces this addictive effect can help a person

better understand how their body is being used against them and the beneficial ways that they can interrupt this harmful process.

“The majority of smokers would like to stop smoking, and each year about half try to quit permanently,” says the National Institute on Drug Abuse. “Yet, only about 6 percent of smokers are able to quit in a given year. Most smokers will need to make multiple attempts before they are able to quit permanently.”

Various types of medications can help manage addiction, such as varenicline, antidepressants like bupropion, or nicotine-replacement therapy. But why is medical treatment like this necessary for nicotine abuse? Unfortunately, addiction is not just a psychological problem but also a physical one due to the impact that the drug can have on the body and mind, particularly its effect on **hormones**.

For example, nicotine causes a quick rush of hormones, known as “endorphins,” in the brain. These hormones produce positive feelings throughout the body. When a person exercises or eats certain high-calorie foods, the body releases endorphins as a reward. Unfortunately, nicotine use also causes the brain to release endorphins.

Endorphins, in turn, affect the **neurotransmitters** in the brain by releasing higher levels of dopamine, another hormone that causes pleasure. Regular nicotine users come to rely on these heavy releases of hormones in order to feel normal. When they don’t use nicotine, they are likely to experience withdrawal symptoms that can be unpleasant and hard to tolerate for very long.

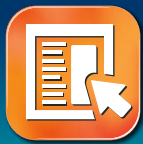
This addictive potential is particularly high with nicotine because of its short half-life in the body. This term refers to how long a chemical or drug stays in a person’s body before it is metabolized. Some drugs, such as alcohol, have very long half-lives, which can cause effects that last for hours. However, nicotine has one of the shortest half-lives of any drug—the effects of nicotine may last only minutes or even seconds in the body of a heavy user who has become more tolerant of the drug.

As a result, nicotine users often take heavy “drags” on their cigarettes or vaporizers to get the heavy flow of nicotine that they want. The ultimate effect is to create a devastating cycle that only worsens the more a person uses nicotine. Eventually, many people find that they end up hating smoking or vaping but are pulled toward it constantly.

This state of abuse is common to anyone who has suffered an addiction of any type. For example, it is the same basic process that occurs in those with alcohol, heroin, or cocaine addictions. Although



*Nicotine exposure during adolescence can hamper a young person’s brain development. Scientists have found that the brain continues to develop until a person is about twenty-five years old. Stunted brain development during the teenage years can have a serious effect on a smoker’s adult life, making it harder for the person to finish college or get a good job.*



## NICOTINE MAY WORSEN THE ADDICTION RISK FOR OTHER DRUGS

Studies have found that the vast majority of people in rehab for drug addiction also smoke or use vaporizers. There is a clear reason for this—nicotine helps to prepare the mind and body for other drugs. In this way, nicotine may be one of the worst gateway drugs of all time. Even heavy alcohol users may be prone to smoking or using vaporizers, even if they don't normally abuse nicotine outside of drinking hours.

the exact chemical changes produced by the substance will vary, the cycle of dependency centers on the artificial release of high levels of hormones and the body's increasing reliance on the chemicals in order to feel healthy and normal.

The relapse rates for nicotine use, unfortunately, are not very promising. Studies have found that 60 to 90 percent of smokers who try to quit end up picking up cigarettes again within a year. It is only when people can stay off the drug for more than two years that the long-term relapse rate declines.

Why does nicotine cause such a high rate of addiction? And how does it impact a person's recovery and chances of quitting? To answer those questions, it is important to examine more factors about the addictive potential of nicotine and the different ways that it affects the brain.

## WHY NICOTINE IS SO ADDICTIVE

The addictive potential of nicotine is so high that the number of deaths it causes every year is almost impossible to understand fully. “Tobacco use is the top preventable cause of disease and death in the United States,” notes the National Institute on Drug Abuse. “Cigarettes cause more than 480,000 premature deaths in the United States each year. That’s about 1,300 deaths every day.”

The tragic part about all of these deaths is that every person who dies due to nicotine abuse knows that their habit is harmful. There’s plenty of medical evidence linking cancer, heart disease, and other health conditions with tobacco and nicotine abuse—no one can deny that at this point. However, people can continue using tobacco anyway, which can be maddening to their loved ones. Some even try to keep smoking even after developing respiratory problems that make it hard to breathe.



*Nicotine has a permanent effect on certain areas of the brain, leading users to become addicted to the drug even after just a short period of use.*

## Fast Facts: The Deadly Effects of Cigarettes

- Cigarette smoking is the leading preventable cause of death in the United States. Nearly one in five deaths each year (480,000 a year) is attributed to smoking.
- More than ten times as many Americans have died prematurely from cigarette smoking than have died in all the wars fought by the United States.
- Smoking causes about 90 percent of all lung cancer deaths.
- Smoking causes about 80 percent of all deaths from chronic obstructive pulmonary disease (COPD).
- The risk of dying from cigarette smoking has increased over the last fifty years in the United States.

Those who aren't addicted might not understand this type of behavior. They might even mock those who suffer from an addiction or tell them that they "just need to stop." Misunderstandings of this type are understandable but also unfair, because they don't take into account just how difficult it really is to overcome addiction to tobacco products. For example, the mental addiction to nicotine is often just as hard, if not more troubling, to overcome than the physical aspect. That's because the dopamine-release cycle mentioned earlier is not only a physical trap in and of itself but also one that can become a great comfort to a person. Take into account, for example, people who smoke when they are stressed. Although nicotine is a stimulant—and, therefore, more likely to worsen their symptoms of anxiety and stress—many people turn to it in these moments to "calm their nerves," similar to the way heavy drinkers abuse alcohol for the same purpose.



*Some people believe nicotine products will help them to focus or give them greater energy. However, studies have shown that these effects only last for a few seconds. Over the long term, nicotine use results in lower energy and a reduced ability to focus on necessary tasks.*

What is happening here is more complex than it may seem. That's because a nicotine addict's emotional state is being affected by use of the drug. Their body craves nicotine and causes distress, emotional disturbances, and even anxiety when they don't use nicotine. As a result, if they take a puff off a cigarette or a vaporizer and feel a sense of relief, their body and mind feel rewarded for triggering these emotional troubles by the use of nicotine.

Even worse, people often feel rewarded in a **psychosocial** way for their nicotine abuse. For example, some students will meet during their lunch break to smoke cigarettes or vape in private. They may share cigarettes from their packs, take hits off the same vaporizers,

or otherwise interact in ways based on their abuse of nicotine. This behavior is not unusual—for many with an addiction, there is a social element that makes this abuse more attractive.

For example, many people who work in offices time their smoke breaks with others so that they can talk and interact together. Often, these people don't have much in common besides their shared addiction to nicotine. However, they form a small group with each other during these breaks, groups that are often hard to leave if a person tries to quit smoking or vaping on their own.

The same influence is noticeable in those who only smoke when drinking alcohol. As they may drink only when socializing, they start smoking as a way of interacting with others and connecting in ways that otherwise might not be possible. That socialization instinct is common to all people, as individuals want to create groups and fit in with each other, no matter how they achieve that goal.

### **Fast Facts: Nicotine**

- Nicotine is both a sedative and a stimulant.
- Chewing or snorting tobacco products usually releases more nicotine into the body than smoking.
- Nicotine is at least as difficult to give up as heroin.
- The side effects of nicotine can affect the heart, hormones, and gastrointestinal system.
- Some studies suggest that nicotine may temporarily improve memory and concentration.
- There are more than one billion tobacco smokers worldwide.

This fact plays into the next section of this chapter: feeling rewarded for abusing nicotine. Remember: all addictions start as the body rewarding itself for using a certain substance. As a result, any type of behavior or situation that rewards a person for abusing nicotine will only increase the abuse potential. Understanding that fact can help to minimize its impact on a person.

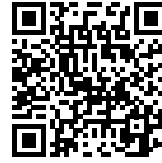
## HOW TOBACCO FEEDS REWARD CENTERS TO WORSEN ADDICTION

Studies into various types of addiction have expanded our understanding of these abusive behaviors and have helped to reinforce many critical lessons. “The measure of a drug’s



*Because the brain becomes dependent on nicotine, a person who tries to stop using the drug will experience unpleasant symptoms of withdrawal. Physical symptoms like headaches, cramps, and difficulty sleeping can persist for three to five days. Mental symptoms of withdrawal, such as depression, irritability, and a strong desire to use nicotine, can last for weeks. Withdrawal makes it very hard for users to quit smoking or vaping.*

*Scan here to learn more about how friends can contribute to tobacco addiction.*



addictiveness is not how much pleasure (or reward) it causes but how reinforcing it is—that is, how much it leads people to keep using it,” writes Nora D. Volkow of the National Institute on Drug Use. “Nicotine does not produce the kind of euphoria or impairment that many other drugs like opioids and marijuana do. People do not get high from smoking cigarettes or vaping. Yet nicotine’s powerful ability to reinforce its relatively mild rewards results in 480,000 deaths annually.”

Nicotine abuse is heavily reinforced in ways that other drugs are not. For example, nicotine use is heavily reinforced by puffing so often on a cigarette or vaporizer. This regular inhalation causes a pattern of behavior that reinforces nicotine abuse and can become calming to many people. In fact, many ex-smokers have stated that they find the lack of “something to do” with their hands and mouth to be the hardest part about quitting.

Research has also found that heavy nicotine users have “learned” their habit in the same way that many activities are learned. For example, the study quoted above states that “learning” nicotine abuse is similar to the way a person learns how to ride a bike and that it cannot be easily forgotten. Even if a person has not ridden a bike for years, he or she can jump right on and get going immediately. The same is true of smoking: former smokers often find that it is incredibly easy to get back into these patterns of behavior after they have quit.

Even worse, studies have found that nicotine abuse seems to make other activities more pleasurable and enjoyable to users, as has been noted with alcohol and drug use. Smoking a cigarette often opens up the brain to a flood of dopamine, which makes the extra levels of this hormone produced by alcohol and other drugs even more rewarding for those who use nicotine.

Surprisingly, this same effect is noted in people who don’t use other drugs. For example, some people may find that smoking while fishing, watching a movie, or taking a walk makes the experience that much more pleasurable. This effect may be compared to that of the “after-dinner” cigarette: the pleasure produced by any enjoyable activity is higher because the nicotine releases extra levels of endorphin hormones that combine with those that are naturally released.

This factor may be somewhat discouraging to many people, because it may make nicotine **cessation** seem nearly impossible. However, many people can and do quit every year. Breaking the connection between nicotine and pleasure is typically the most important step in this process. Before getting started, though, it is critical to know more about the statistics regarding these behaviors.



## TEXT DEPENDENT QUESTIONS

1. Which hormones are released when a person uses nicotine?
2. How does social interaction reward nicotine abuse?
3. Why do smokers feel pleasure when using nicotine during other activities?



## RESEARCH PROJECT

Talk to people in your life who abuse nicotine in any form. Ask them about other friends they have who use nicotine, and ask them to examine how their abuse brings them closer together. Do they feel that their friends who abuse nicotine are “closer” to them or are people to whom they can more easily relate? Why do you think that people feel the way that they tell you? Write a brief essay about these factors, using any information you may have on the topic to expand your focus.



*Cigarette smoke contains more than 7,000 chemicals, many of which are poisonous to humans or have been proven to cause cancer.*



## WORDS TO UNDERSTAND

**advantageous:** referring to something that is beneficial or useful, providing an advantage

**denormalize:** to make something appear dangerous or not “normal” to a large number of people

**subset:** a specific division of a larger group

# Statistics on Cigarette Smoking

It is important to understand how cigarettes impact a person's body and how much money this dangerous habit costs the country every year. Billions of dollars are lost due to this destructive and devastating health issue. Studies have found that cigarette use in the United States is declining every year, thanks in part to anti-smoking legislation and other types of health advocates. However, it is also decreasing due to the impact of vaping on the industry, yet the still-widespread use affects millions of people every day.

## FACTS ABOUT CIGARETTE USE

The basic statistics of cigarette use are not as devastating as they were years ago, but they remain a concern for many people. “Smoking leads to disease and disability and harms nearly every organ of the body,” explains the Centers for Disease Control and Prevention (CDC). “Smoking is the leading cause of preventable death.” This government agency is an important source of information regarding smoking and cigarette statistics and has related many troubling facts about the use of nicotine products.

That's why—as the CDC reports—the tobacco industry spends billions of dollars to market its products every year. Tobacco companies understand that, as more of their customers die, they need



# COPD

## Chronic Obstructive Pulmonary Disease

### COPD Symptoms

- ♦ Chronic Cough
- ♦ Production of Mucus
- ♦ Fatigue
- ♦ Shortness of Breath
- ♦ Dyspnea
- ♦ Chest Discomfort

### COPD Causes



Smoking

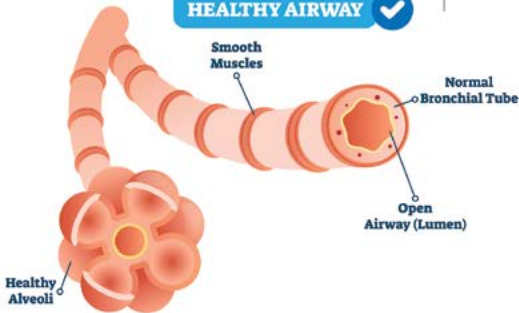


Air Pollutants



Genes

### HEALTHY AIRWAY



Smooth Muscles

Normal Bronchial Tube

Open Airway (Lumen)

Healthy Alveoli

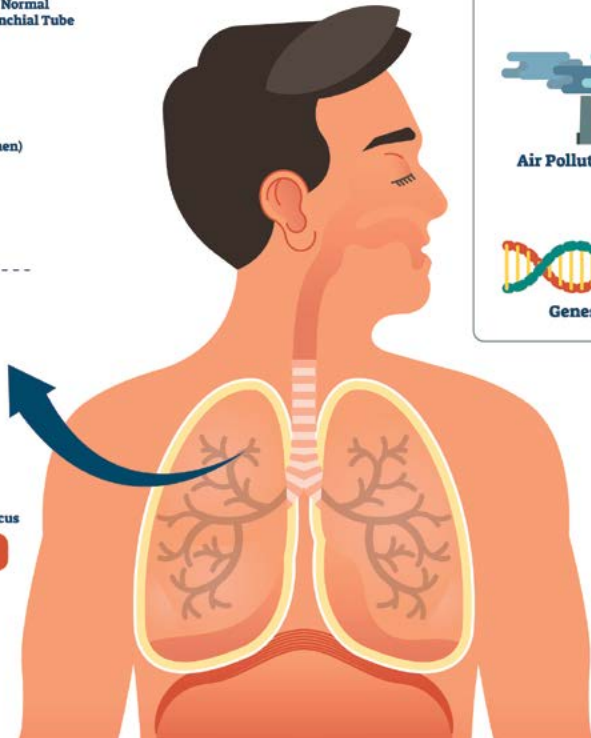
Inflammation and Excess Mucus

CHRONIC BRONCHITIS



Alveolar Membranes Break Down

EMPHYSEMA



Long-term exposure to cigarette smoke and other lung irritants causes a serious breathing disorder called chronic obstructive pulmonary disease, or COPD. Scientists have found that vaping can make COPD symptoms worse. There has not yet been enough research to definitively prove that e-cigarettes cause this disorder, because e-cigarettes have only been around for about ten years.

## Fast Facts: Smoking and Heart Disease

- Smokers are at greater risk for diseases that affect the heart and blood vessels (cardiovascular disease). Strokes and coronary heart disease are among the leading causes of death in the United States each year.
- Smoking damages blood vessels and can make them thicken and grow narrower. This makes a person's heart beat faster and your blood pressure go up.
- Smoking can cause blood clots that close off blood vessels, causing strokes and reducing blood flow to the limbs and skin.
- Even people who smoke fewer than five cigarettes a day can have early signs of cardiovascular disease.

to attract new smokers or nicotine users in order to remain profitable. The marketing methods used by Big Tobacco are often quite insidious and take on many different forms, including paying stores money to place their tobacco products as near checkout lines as possible so that smokers and kids can see them.

As a result, the United States loses billions of dollars every year due to tobacco use. Where does this loss come from exactly? Lost work hours—people getting sick due to smoking—and health treatments, for example. Because many, many smokers end up developing cancers of some type, billions of dollars are spent on health care every year as a result. That impact is significant and is one reason why so many anti-tobacco advocates push so hard to end this destructive habit.



*White patches or sores that don't heal on a tobacco user's lips or mouth are common signs of oral cancer.*

One frustrating element about this issue is the fact that states don't spend nearly as much money as they should to help combat tobacco abuse. Currently, states receive millions of dollars every year from tobacco taxes and lawsuits. Under the terms of the tobacco Master Settlement Agreement negotiated in the late 1990s, they should invest at least 12 percent of these funds in programs intended to reduce tobacco use and educate consumers about the dangers of nicotine products. However, most states don't meet even that modest level of investment. Instead, they typically use their tobacco

settlement funds on other purposes, many of which are necessary, such as education, but not the reason these funds have been allocated.

Although cigarette use is down, the CDC reports that 13.7 percent of all adults in the U.S. smoked cigarettes as of 2018. The CDC found that 15.6 percent of adult American men smoked, compared to 12 percent of women. These numbers show a heavy decrease and, as reported by many sources, represent the lowest rates of cigarette use in the U.S. in decades. Unfortunately, many people are not quitting tobacco products altogether. Instead, they are turning to e-cigarettes and other products that contain nicotine. “Cigarette smoking remains



*In the United States, a person who smokes cigarettes is fifteen to thirty times more likely to develop lung cancer than a nonsmoker.*

a leading cause of preventable disease and premature death in the United States and other countries,” writes Dr. Neal Benowitz. “On average, 435,000 people in the United States die prematurely from smoking-related diseases each year; overall, smoking causes one in five deaths. The chance that a lifelong smoker will die prematurely from a complication of smoking is approximately 50 percent.”

That last percentage seems almost ludicrous—a person who smokes has a 50/50 chance of dying early due to smoking-related illnesses. In light of this danger, it may be hard to imagine cigarette use remaining steady or increasing. Thankfully, though, studies have shown that tobacco use is declining in many ways. Understanding this fact is critical for getting a full grasp of this epidemic and its proper management.



## HOW TOBACCO USE HAS CHANGED IN HOLLYWOOD

In the early years of Hollywood, tobacco use was often used to define a person as elegant or sophisticated. During the 1950s and 1960s, it took on a rebellious stance that attracted many teens. This perception has stayed strong ever since, although the 1990s and beyond have seen a significant decrease in cigarette use on film. Modern films often use cigarettes to make a person look or seem lower class, less intelligent, or “bad” in some way. Such images have become common and are viewed by many children every year, which may help decrease cigarette use even further.

## Fast Facts: Smoking and Lung Disease

- Smoking can cause lung disease by damaging the airways and the small air sacs (alveoli) found in the lungs.
- Chronic obstructive pulmonary disease (COPD) is a chronic inflammatory lung disease that causes obstructed airflow from the lungs. COPD includes emphysema and chronic bronchitis, both of which are caused by inhaling cigarette smoke. Smokers are twelve to thirteen times more likely to die from COPD than nonsmokers.
- Cigarette smoking causes most cases of lung cancer.
- If you have asthma, tobacco smoke can trigger an attack or make an attack worse.

## CIGARETTE USE IS DECLINING

Cigarette use has declined steadily over the past two decades. In 2005, about 21 percent of adults in the U.S. smoked cigarettes. By 2018, that figure had fallen to 13.7 percent—the lowest level ever recorded by the Centers for Disease Control and Prevention. Yet, more than 30 million American adults smoked cigarettes “every day” or “some days,” according to the CDC.

The CDC also reported that the percentage of adults who reported ever trying cigarettes declined from 59 percent in 2005 to 50.8 percent in 2016. This decrease is particularly promising, because it means that a growing number of children are not even trying cigarettes and are staying tobacco free. Either approach is **advantageous** in many ways.

Which group experienced the largest decrease in cigarette use? This study found that the highest decrease was in the age twenty-five to forty-four range. This finding is critical, because it shows that anti-tobacco advertising and other methods are working. Not as many people are finding that cigarettes are attractive or appealing, and more are turning their backs on this destructive and dangerous habit.

These findings were considered “consistent” with the decline in adult cigarette smoking that had been occurring over the last few decades. The study also reported that more people were quitting smoking as well, although the rate was lower than hoped. The number of cigarettes the average person smoked per day declined from seventeen to fourteen. Increasing tobacco taxes and prices may have contributed to this change.



*Although cigarette use in the United States has declined over the past two decades, about 250 billion cigarettes are still produced and sold in the US each year.*

Even better, it was found that the number of those who smoked twenty to twenty-nine cigarettes every day dropped from nearly 35 percent to just over 28 percent in the same time. And those who smoked fewer than ten cigarettes per day rose from 16.5 percent to 25 percent. That change is a little concerning but could be explained by data that indicates that formerly heavy smokers are smoking fewer cigarettes, not that the overall number of smokers is increasing.

Unfortunately, these gains have been offset by a few issues. For example, the same study found that cigarette smoking remained high among several **subsets** of individuals. These included Native Americans, Alaskan Natives, those with psychological problems, uninsured people, those below the poverty level, LGBTQ+ individuals, and those in the Midwest and South.

The reasons for this uneven decrease aren't clear. Some speculate that those with lower incomes may have less access to anti-smoking help. Others may find that they cannot get the medical insurance

*To learn strategies that can help a person quit smoking, scan here.*



necessary for treatment. In other cases, cultural differences may make smoking more common or accepted among these groups and subsets of people.

Ways to combat this problem would include an increase in Medicaid coverage, better education on these health problems, and an increase in anti-smoking campaigns. This last approach is particularly important for young people, because it can make them turn against smoking and help to decrease the statistics in all groups even further.

Just as important, it is crucial to further understand why these decreases in cigarette use are occurring and how best to emphasize these reasons. A growing number of doctors and anti-smoking advocates are attempting to better understand all of these issues and to integrate higher-quality control methods that help to decrease the risk of becoming addicted to nicotine.

## REASONS FOR THESE DECREASES

In spite of the fact that cigarette-use statistics remain high in some groups, anti-smoking advocates are very excited about the changes. “Fifty years ago, it seemed impossible to imagine a world where less than 15 percent of adults smoked,” recalls the American Heart Association. “At the time, roughly 42 percent of American adults lit up, and smoking was a normal part of everyday life. You could smoke at work, in restaurants and bars, and on planes. You could buy cigarettes from vending machines. Tobacco was glamorously portrayed in the movies and on TV and advertised on billboards lining the highways.”

This change, which has been in progress since at least the mid-1960s (when 42 percent of Americans smoked), has been slow. The industry freely ran advertisements on television—including using cartoon characters to market directly to children—and even claimed that smoking has positive health effects in smokers.

They reported these “facts” even though they had known for decades that nicotine was an addictive and harmful substance. Even as early as the 1900s, doctors and medical professionals were reporting that tobacco was dangerous. However, tobacco companies fought those findings for years, until the Surgeon General released a report on cigarettes in 1964 that directly connected cigarettes with cancer and other health issues.

Slowly but surely, anti-smoking laws and policies started to be adopted at the federal and state levels. Health advocacy groups



*Secondhand smoke is dangerous to nonsmokers' health. The Centers for Disease Control reports that secondhand smoke can increase the risk of developing lung cancer in nonsmokers by 20 to 30 percent. As a result, smoking and vaping are no longer permitted in many public places.*

helped to spread the word of the dangers of nicotine and helped to **denormalize** the use of tobacco. This process helped to take away the glamorous and exciting feel of cigarette use and made it seem dangerous and unhealthy.

The increase in cigarette prices has also helped to make this a much less appealing habit, particularly for younger smokers. As tobacco companies often tried to market heavily to those groups, the high cost of cigarettes made smoking less attractive to young people, who typically have less disposable income. Restrictions on advertising, massive lawsuits, and better education also helped spread the word.

With the allure of smoking having been removed, fewer and fewer people now try out cigarettes in the first place. It's all about changing perceptions and slowly getting people to understand the dangers of something. People are often quite stubborn and hard to change—current smokers likely don't react to anti-smoking messages and may even keep buying cigarettes as prices go up, but younger people are more likely to react to these changes and to stay away from smoking for good.

As a result, it is critical to examine the statistics for tobacco and nicotine abuse. Sadly, the dangers of vaping are just becoming well known, and many vapers are trying to ignore them or to claim that these findings are simply propaganda intended to put vaping companies out of business. These types of claims were not uncommon among smokers when the first health risks of cigarettes became public.

Will it take another fifty years to change the perception of vaping and decrease its current persistence among the youth population? Hopefully not. Before looking that far ahead though, it is a good idea to understand just how widespread this problem has become. Doing so can help to ensure that people who are interested in this habit can stay away from it and remain healthy and happy and nicotine free.



## TEXT DEPENDENT QUESTIONS

1. How much has cigarette use gone down in recent years?
2. Which groups have seen less of a decrease in cigarette use?
3. What are the most common reasons for a decrease in cigarette use?



## RESEARCH PROJECT

Talk to people among your peer group about cigarette use to get their opinions on how they perceive smoking. How many among them currently smoke and think that it is “cool” to do so? How many don’t smoke or have quit smoking because they are worried about how it affects their health? Next, ask them how they perceive people who smoke. Do they think that smokers seem more adult and mature or immature and childish? Once you have answers from many people, ask yourself what you think about smoking and how your opinion fits in with those of your peers.



*Electronic vapor devices, also known as e-cigarettes, have been promoted as a healthier nicotine-based alternative to cigarettes. However, federal and state health officials have investigated hundreds of cases of vaping-related lung disease in otherwise-healthy young people.*



## WORDS TO UNDERSTAND

**negligence:** in this context, a legal term that places the responsibility for a person's injury on the actions of another party

**precipitously:** referring to an action that occurs very quickly or suddenly

# The Numbers on Vaping Addiction

When nicotine vaporizers debuted on the market in the mid-2000s, they were marketed as a powerful way to overcome cigarette addiction. Many people who wanted to quit cigarettes then transitioned to these products, and many successfully quit. However, there came a point when the makers of these devices saw dollar signs and threw their integrity out the window.

Suddenly, these pens were expanded to be more powerful and to allow users to adjust their intake of nicotine. New and tasty flavors of vapor were debuted using fun and colorful graphics. The intent was clear—they were marketing directly to teens, those whom tobacco companies had long considered their “replacement customers.” The big business of nicotine addiction was too much for the vaporizing companies to resist, as they sought a larger share of the market for nicotine products.

As cigarette use rates fall **precipitously** every year, vaporizer use increases almost just as much in many areas. The problem here is real—thousands, perhaps millions, of people are abusing these vaping pens thinking that they are safe. Unfortunately, injuries and deaths have occurred due to vaping. These issues occur because vaping can cause problems that are much different from those offered by cigarettes and may be, in their own way, just as severe.



*Since 2014, e-cigarettes have been the tobacco product that is used most commonly among American teenagers. By 2018, more than 3.6 million Americans under the age of eighteen were regularly using an electronic vapor device.*

## VAPING USE IS RISING RAPIDLY

In every school, there are probably at least a few people who have used vaping pens. Some parents or teachers have used e-cigarettes to quit smoking. Whatever the case, most younger people have been exposed to vaporizers by the time they are teenagers, and many teens have a positive view of e-cigarettes and vaping. Many studies have found that vaping is a widespread problem among high-school students. In a 2018 survey, 37 percent of all high-school seniors said they had vaped recently. That was a 9 percent increase from the previous year. The most popular vaping substance was nicotine, though additives like flavored fluids, THC, and CBD were also popular.

These numbers have many in the medical field concerned, such as Dr. Richard Mieche of the University of Michigan, who directed the 2018 study. “Vaping is reversing hard-fought declines in the number of adolescents who use nicotine,” said Dr. Mieche. “These results suggest that vaping is leading youth into nicotine use and nicotine addiction, not away from it.”

“Teens are clearly attracted to the marketable technology and flavorings seen in vaping devices,” agrees another expert, Dr. Nora D. Volkow of the National Institute on Drug Use. “However, it is urgent that teens understand the possible effects of vaping on overall health, the development of the teen brain, and the potential for addiction.”

Here are a few more statistics that showcase the impact that vaping has had on cigarette use. According to recent surveys, about 55 percent of adult smokers have tried to quit, which was a 2 percent increase from previous years. A total of 7.5 percent said that they had successfully quit, a 1 percent increase. Many of those who were trying to quit had used vaporizing pens and other cessation tools. Perhaps that’s why the success ratio jumped from 52 percent to 62 percent in just ten years.



*A pod vape contains two elements: a pod filled with vape juice (left) that snaps into a small battery unit (right). Some pre-filled pods are disposable, while others can be refilled. Since 2017, the Juul brand of pod vapes has become the most popular e-cigarette in the United States, particularly among teenagers.*

## Fast Facts: Vaping and E-Cigarettes

- A recent study by the Centers for Disease Control and Prevention found that 99 percent of the e-cigarettes sold in the United States contain nicotine. Some e-cigarette labels do not disclose that they contain nicotine.
- Nicotine can harm the developing adolescent brain. The brain keeps developing until about age twenty-five.
- Using nicotine in adolescence can harm the parts of the brain that control attention, learning, mood, and impulse control.
- Using nicotine in adolescence may also increase the risk of future addiction to other drugs.

However, the bad news is that, in spite of these successes, one in five adults is still using some form of nicotine. Many experts point to vaping pens as the primary culprit for this steady rate of nicotine abuse. “It’s a good news/bad news thing,” says Dr. David Hill of the American Lung Association. “We’ve made tremendous strides over decades in decreasing combustible cigarette use, but when you look at this report, and they talk about e-cigarette use, it’s very concerning.”

While e-cigarettes are only a small portion of tobacco use among adults (at 3.2 percent use, it trails the 3.9 percent of people who smoked cigars), the increase among teens has more than made up for it. This trend concerns many specialists, such as Dr. Emanuela Tailoi of the Institute of Translational Epidemiology at the Icahn School of Medicine at Mount Sinai in New York City. “Youth is the age when



*By the spring of 2020, state and federal health officials had investigated thousands of cases of vaping-related lung illnesses in the United States, including dozens that ended in the vaper's death. Nearly half of the cases involved e-cigarette users under the age of twenty-five.*

people experiment, and this is a new thing,” says Dr. Tailoi. “Many of them don’t know it contains nicotine, and that’s how they get addicted. Nicotine is the most powerful addictive product existing on the market.”

The biggest concern among medical professionals is that these rates will continue to increase and put whole generations at risk of dangerous side effects of vaping. As more and more reports are released regarding vaping, the myth of its safety has been completely debunked. But as the primary target of vaping seems to be teens, many of these users are waving away the concerns or don’t believe that they apply to them.

The concerns seem to be justified, as a sudden glut of injuries and even deaths from vaping have been occurring over the last few years.



## WHY PEOPLE IGNORE THE ADVICE OF DOCTORS

When medical experts release information proving that activities like vaping are dangerous, many are likely to laugh away these concerns and continue to vape anyway. Some may even claim that there is a conspiracy by doctors to make vaping illegal. Why do people have these types of feelings about medical professionals? Fear is often a primary driving factor. Many experts state that it is easier for people to deny evidence of harm than to face the harm in their life. Others may not trust doctors who make money by treating them.



*President Donald J. Trump, joined by First Lady Melania Trump, Acting FDA Commissioner Norman Sharpless (left), and Secretary of Health and Human Services Alex Azar (right), announced in September 2019 that the Food and Drug Administration was working on a plan to remove flavored e-cigarette products from sale. The FDA ban of many flavored products went into effect in January 2020.*

These problems are different from those caused by cigarette smoking, because cigarettes, in spite of their harm, injure people slowly over a period of several years. Unfortunately, vaping can cause injury or deaths very quickly, which is something reflected in recent statistics regarding medical treatment for vaping-related injuries.

# THE HARM OF VAPING

When vaping was first introduced, it was marketed as safe to users. This claim concerned many in the medical community, because they believed that more testing needed to be done before such claims were made. However, the testing went more slowly than the products could sell, and soon tens of thousands of people were using vaporizing pens every day.

The studies' findings were not positive. Contrary to the claim that the pens were not simply nicotine-replacement tools, the CDC found that 99 percent of all e-cigarettes that were sold contained nicotine. Even those products marketed as containing no nicotine did have some in smaller amounts. Such willful mismarketing was designed to addict as many people as possible and was considered a form of **negligence** by the CDC.

Further studies have also found that, even when not consumed via cigarettes, nicotine can harm the brain and cause damage to attention

## Fast Facts: Nicotine and Pregnancy

- Nicotine products can make it harder for a woman to become pregnant.
- Nicotine can also affect men's sperm, which can reduce fertility and also increase the risk of birth defects and miscarriage.
- Unborn babies are affected when their mothers smoke cigarettes. They are more likely to die before birth or to be born prematurely.
- Babies born to tobacco users are more likely to have low birth weight and birth defects. They are also at greater risk of sudden infant death syndrome (SIDS).



*People who like to expel large clouds of vapor may be setting themselves up for lifetime problems by setting their heating coils at a powerful level. This makes them more likely to be exposed to higher levels of arsenic, cadmium, chromium, and nickel—all of which are considered carcinogens by the International Agency for Research on Cancer.*

span, learning capabilities, and mood management. These problems are more likely to occur in teens and younger adults, who are still developing mentally and physically. “Each time a new memory is created or a new skill is learned, stronger connections—or synapses—are built between brain cells,” notes the Centers for Disease Control and Prevention. “Young people’s brains build synapses faster than adult brains. Nicotine changes the way these synapses are formed.... Using nicotine in adolescence may also increase risk for future addiction to other drugs.” Studies have shown that people who abuse drugs, such as marijuana, cocaine, and heroin, more often abuse nicotine products as well. Usually, they start out smoking cigarettes or vaping and then transition to other substance abuse. All of these issues could lead to a heavy increase in addiction rates throughout the country.

The CDC is concerned about the injuries that vaping has already caused. Although the numbers are nowhere near as high as with cigarette use, this may be only because cigarette use is more carefully tracked. Other reasons for this uncertainty include the fact that other diseases were blamed for injuries or deaths that may have been caused by vaping. “The Centers for Disease Control and Prevention and state agencies have reported 2,506 lung injury cases that required hospitalization and 54 deaths linked to vaping,” writes Jonathan Corum in the *New York Times*. “The rising case count includes both recent cases and earlier pneumonia-like cases that are only now being recognized as related to vaping.”

Could it be possible that there have been more deaths and injuries related to vaping as a result? Absolutely. The exact numbers will be hard to track, because many medical professionals are still not certain of what causes injuries in those who vape. Some believe that certain chemicals found in many liquids—especially marijuana-related fluids—may be to blame for these issues.

Other medical professionals believe that nicotine overdose could be to blame. Although smokers rarely have to worry about this problem, those who vape may experience it. That's because the nicotine from a cigarette is nowhere near high enough to trigger an overdose. And since nicotine metabolizes from the body so quickly, the overdose risk from cigarettes and even cigars is very low.

However, vaporizing pens allow users to adjust their intake of nicotine in a dangerous way. For example, a single container of vaping fluid contains as much nicotine as a full pack of cigarettes. So, heavy users who go through more than one container per day could find themselves overdosing and getting dangerously sick. But why is vaping so popular, even as more medical professionals find that it poses these types of dangers?

***To learn why the FDA banned most flavored vaping fluids, scan here.***




## REASONS VAPING IS POPULAR

The reasons for the popularity of vaping have been heavily discussed by many in the medical community. For example, a study examining vaping in Canada found that the devices themselves were a big part of the popularity. “We used to say that cigarettes are the most effective way of consuming nicotine, but e-cigarettes have replaced them,” explains Dr. Robert Schwartz, a senior scientist at Toronto’s Centre for Addiction and Mental Health. “They’re so small and discreet, and these new devices don’t create the huge clouds that the previous devices did—people can use them anywhere, all the time.”

Unlike old vaporizing items, which often felt rather clunky or hard to use, more popular choices mimic the feel of a cigarette, in both the mouth and the throat. Both Juul and Vype, which are among the most popular products on the market, use “nicotine salts” that deliver high concentrations of nicotine and produce the physically grating feeling of smoke against the throat. As a result, many ex-smokers fall into the habit of using these devices instead of cigarettes.

This adjustment has made vaping not only easier for people to tolerate but more addictive as well. Typically, before Juul, most vaporizer companies used around 20 milligrams of nicotine per milliliter in their fluids. However, Juul and Vype use much higher concentrations of 59 and 57 milligrams of nicotine, respectively. As a result, those who use these products not only get a higher buzz but addicted more quickly. And these companies advertise this fact proudly! Juul states that its pods have about the same amount of nicotine as a pack of twenty cigarettes. Users then flock to this option, because they believe that it is safer and cheaper to use than smoking cigarettes. Unfortunately, they are wrong, as growing cases of vaping-related diseases spread throughout the world at a fast pace.

This popularity is often focused among teens, who can find e-cigarettes more easily and can afford them. They can also head



to the bathroom between breaks in school and take a quick puff on the vaporizer in a way that they can't with cigarettes. In a certain way, vaping has become the new "rebellious" thing for teens to do instead of smoking. As most teens now know that cigarettes are dangerous, they use vaporizers as a way of feeling more mature and adult than their peers. Unfortunately, these teens have fallen victim to the advertising and propaganda of the vaping industry. They are not rebelling at all, but being manipulated into a dangerous and potentially deadly habit. As studies are now finding that vaping causes severe damage to lungs, the throat, and other parts of the body, these young people are likely to get sick or experience other side effects due to vaping.

As a result, it is very possible that a growing number of people will end up in a very similar situation and that statistics regarding vaping injuries may increase. We're still in the early days of this product, and the ultimate results of its misuse may be hard to fully grasp right now. You can expect the statistics mentioned above to get worse, though, before they get any better.



## TEXT DEPENDENT QUESTIONS

1. How does vaping use affect cigarette use in teens?
2. Why are teens more prone to injury from vaping pens?
3. What could cause a nicotine overdose?



## RESEARCH PROJECT

Using the Internet or your school library, find out how a vaporizer works. Are they simple to understand, or do they require specialized knowledge? Write a two-page paper, and share it with your class.



*Tobacco leaves dry in a barn so they can be processed into cigarettes, smokeless tobacco, and other products. Farms in the United States harvest more than 500 million pounds of tobacco each year.*



## WORDS TO UNDERSTAND

**inauspicious:** referring to something that is not promising or seems unlikely to be successful

**socioeconomic:** referring to the interaction of society and economic factors and influences

**unpropitious:** referring to a circumstance in which a positive outcome is unlikely

# Examining Smokeless Tobacco's Impact

Though it may be hard for some to believe, the use of smokeless tobacco products—such as chew and snuff—remains prevalent throughout the country. Although the use of smokeless tobacco products was never as widespread or as popular as cigarette smoking, it remains very persistent in many parts of the country and in many segments of the population. In many ways, smokeless tobacco is kind of a quiet epidemic—although anti-smoking advocacy is common, the use of smokeless tobacco products is often overlooked or ignored.

In the age of vaping, smokeless tobacco is even more commonly neglected or ignored by the average person. However, it consistently causes major health problems in those who use it, such as various types of cancers. Even worse, smokeless tobacco users have a tendency to use these products while also using other sources of nicotine, which can cause many **unpropitious** types of reactions that may even be deadly.

As a result, it is important to explore this topic in more depth to get an idea of the impact that it has across America. Remember: no tobacco or nicotine source is safe, and smokeless tobacco is among the most dangerous, in spite of its **inauspicious** profile.

## SMOKELESS TOBACCO USE STAYS CONSISTENT AMONG ADULTS

Anti-smoking advocates often point to the decreasing rate of cigarette use—from as high as nearly 50 percent of the population to less than 15 percent—as proof of their success. As cigarettes were, by far, the most popular form of nicotine abuse, this heavy decrease has undeniably likely saved millions of lives.

However, these advocates don't often bring up smokeless tobacco or its prevalence of use throughout America. This lack of focus is understandable—this type of nicotine product has never been as popular as cigarettes. And while anti-tobacco groups have made many



*Smokeless tobacco products are chewed, sucked on, or sniffed, rather than smoked. The user absorbs nicotine through the soft tissues of the mouth.*

attempts to control its spread, their focus on it has never been as high as on cigarettes or, more recently, e-cigarettes.

As a result, smokeless tobacco use rates have not declined anywhere nearly as much as these anti-tobacco advocates would like. For example, a recent study examined those who had used a smokeless tobacco product at least once in the previous month. It found that smokeless tobacco use was very low among women (less than 0.5 percent of the population), a trend that has been very consistent with smokeless tobacco use over the years. Typically, advertising and marketing for this product has focused on a “manly” or “rugged” image, in an attempt to appeal to men, who are statistically much more likely to abuse smokeless tobacco than women.

For example, it was found that about 7 percent of the male population of the country abused smokeless tobacco. This number is still about half that of the number of men who smoke cigarettes. However, health officials are concerned, because these rates have slightly increased in recent years. The exact reasons for this are uncertain, though it is possible that many are turning to smokeless tobacco to help them stop smoking and have ended up hooked on the products, as others have with e-cigarettes.

Beyond this concern is the fact that abuse rates often vary heavily based on many **socioeconomic** factors. For example, it was found that the highest abuse rates of smokeless tobacco occurred among Native American and Alaskan Natives, at about 8.4 percent of their populations. Smokeless tobacco use was lowest among Asian Americans (0.4 percent) and African Americans (1.4 percent) while being fairly high among the Caucasian American population (4.5 percent).

Abuse rates also vary based on geographical location. For example, they were found to be much higher than average in Wyoming (9.8 percent)—this rate may also be affected by the fairly

## Fast Facts: Smokeless Tobacco Risks

- Smokeless tobacco contains at least 28 cancer-causing chemicals and is known to cause cancer of the mouth, esophagus, and pancreas.
- Gum disease, tooth decay, and tooth loss can result from chewing tobacco use.
- The use of smokeless tobacco during pregnancy increases the risk of premature delivery or stillbirth.

low overall population of the state and the heavy concentration of Native American residents. Similarly high abuse rates were noted in West Virginia (8.5 percent), Arkansas (7.8 percent), and Montana (7.7 percent). The lowest abuse rates were found in the District of Columbia (1.3 percent), Rhode Island (1.5 percent), Maryland (1.6 percent), and California (1.7 percent). Reasons for these rates likely vary based on gender disparity and the distribution of races throughout each state or region.

The varying rates of abuse may also have much to do with the type of anti-tobacco education that occurs in each state. Studies have shown that these programs, when started early enough, do have a positive impact on the use of tobacco products. While they don't stop everyone from trying and abusing these items, education does help to drastically reduce these rates of abuse.

California, Delaware, and Vermont, for example, have strong anti-smoking programs, which are not as common in less-populated states, such as Montana and Wyoming. These western states also have heavy concentrations of men, due to their rich oil work and other types of difficult manual labor, which may contribute to higher rates of smokeless tobacco use.

Whatever the influences on these statistics, they are important to keep in mind when learning more about this tobacco product. As mentioned previously, these rates have remained fairly consistent for years. This is a significant problem, because smokeless tobacco is just as dangerous as cigarettes and vaping. In some ways, it may even be more dangerous, because users are exposed to high concentrations of nicotine directly on delicate areas of the body. Therefore, it is critical to understand this problem and its potential impact on its population of users.



*Like cigarettes and e-cigarettes, use of smokeless tobacco products results in many health problems, including gum disease, tooth decay, tooth loss, and oral cancer.*

# MARKETING SMOKELESS TOBACCO TO YOUNG PEOPLE

As cigarette smoking among young people has declined, tobacco companies have looked for other ways to market their toxic product. One of those ways is by promoting smokeless tobacco products. Big Tobacco has sought to attract young consumers by offering their



## SMOKELESS TOBACCO AND THE HEART

The link between tobacco and cancer is clear, but what is less well known is that using smokeless tobacco can also be damaging to a person's heart and circulatory system. Unlike smoking, where the user goes through high and low periods of nicotine exposure, smokeless tobacco use results in more prolonged, sustained levels of nicotine absorption into the body, which can last for up to 60 minutes at a time. Scientific tests have shown that this results in an increase in the user's blood pressure and heart rate. The heart rate can increase by up to 19 beats per minute. Studies found that smokeless tobacco's effect on the heart becomes stronger in older users, suggesting that it can permanently affect the heart rate.

products in a variety of candy-like flavors, and by advertising them in magazines that teenagers are likely to read. In 2018, the top five smokeless tobacco producers spent over \$658 million on advertising.

As a result of this changed focus, the number of young people who use smokeless tobacco has been on the rise for the past few years. According to the 2019 National Youth Tobacco Survey, almost 5 percent of high school students reported using smokeless tobacco products. As with adults, the rate of use was higher among young men than among young women. The National Youth Tobacco Survey found that the rate of smokeless tobacco use among high school boys was about the same as the rate of cigarette use (7.5 percent for smokeless tobacco use and 7.3 percent for smoking cigarettes). Each day, estimates the Campaign for Tobacco-Free Kids, more than 900 adolescents between the ages of twelve and seventeen try smokeless tobacco for the first time.

Data from another federal study, the Youth Risk Behavior Survey, indicated that smokeless tobacco use among high school boys exceeded the national rate in 24 states. In 2017, the states with the highest boys' smokeless tobacco use rates were West Virginia (19.3 percent), Arkansas (17.9 percent), Kentucky (17.2 percent), Louisiana (15.8 percent), and Oklahoma (15.2 percent).

The Youth Risk Behavior Survey also found that high school athletes use smokeless tobacco at higher rates (11 percent) than non-athletes (under 6 percent). About 17.4 percent of male high school athletes admitted to using smokeless tobacco.

Flavoring is a big part of the appeal of smokeless tobacco products. Cigarette companies are not allowed to sell flavors other than menthol, and the federal government banned many flavored vape juices in 2020. However, smokeless tobacco products are still sold in mint and fruit flavors, which appeal to kids. "These products come in an array of candy, fruit, dessert and cocktail flavors, such as sour apple, cherry, grape, chocolate, strawberry margarita, appletini,

piña colada, cotton candy and cinnamon roll,” notes anti-tobacco group Truth Initiative. “Flavored tobacco products also typically have bright, colorful packages and are often sold individually and cheaply, making them even more appealing to youth and young adults. Research on national use patterns, perceptions, marketing and existing policies makes clear that the United States needs a ban on flavored tobacco products to protect public health.”

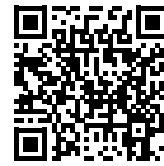
## SMOKELESS TOBACCO IS VERY DANGEROUS

The lack of attention people have placed on smokeless tobacco is very troubling, because, like all forms of tobacco, this product is very harmful to users. People who don’t take these concerns seriously may end up finding themselves experiencing many health issues. The total number of people suffering from these problems is often hard to track, because other issues may affect the development of these diseases.



*Finely ground “snuff” tobacco is available as a loose grainy substance, or packed into small bags that can be held in the mouth with less mess.*

*Scan here to learn more about  
the dangers of smokeless tobacco.*



“Smokeless tobacco is linked to several different types of cancer, including cancer of the mouth, esophagus and pancreas,” notes the American Lung Association. “Smokeless tobacco contains at least 28 cancer-causing chemicals (carcinogens). Smokeless tobacco use can cause gum disease, tooth decay, tooth loss and the formation of white or gray patches inside the mouth called leukoplakia that can lead to cancer. Smokeless tobacco use during pregnancy increases the risk for early delivery and stillbirth.”

Many of these chemicals are common to all types of tobacco, including cigarettes, cigars, and vaporizers. The most dangerous of these are likely nitrosamines, which are specific to tobacco. These typically form during the tobacco growth process, including curing, fermenting, and aging it properly. Often, these chemicals are in their highest concentration in some brands of chewing tobacco.

Likewise, many smokeless tobacco users likely don't realize that tobacco fields are often fertilized using an element known as "polonium-210," which is radioactive. As a result, some tobacco products may have trace amounts of radioactivity that could cause dangerous reactions in those with a higher risk of cancer, such as those with a genetic predisposition for this disease or a family history.

Although this health risk is low, smokeless tobacco contains many other elements that can cause dangerous reactions. For example, tobacco leaves are typically heated to dry them out for processing. However, this process releases what are known as "polynuclear aromatic hydrocarbons." These complex-sounding chemicals can produce a higher risk of cancer in smokeless tobacco users, particularly when used consistently over a lengthy period.

Studies have also found that smokeless tobacco often contains a large number of harmful metals, such as arsenic, cadmium, cobalt, nickel, lead, mercury, beryllium, and chromium. These heavy substances can be toxic in the body when taken in large amounts. While a person may not experience poisoning with one "dip" of smokeless tobacco, sustained heavy use could trigger some bad reactions and cause an increase in cancer risk.

Before discussing the dangers of cancer from smokeless tobacco, it is important to mention a few other health problems that it has been proven to trigger, including gum disease, tooth loss, dental decay, higher risk of stillbirth, malformations in a baby's brain, higher risks of heart disease and stroke, large risk of nicotine poisoning, and even infections throughout the mouth.

All of these health issues are minor compared to the higher risk of cancer that comes with smokeless tobacco. Studies have found that smokeless tobacco use can cause patches inside of the mouth known as leukoplakia. These abnormal patches increase a person's risk of mouth, esophagus, and pancreas cancer almost exponentially. Many of these cancers are among the hardest to control and manage.



*At one time, tobacco companies would pay farmers to advertise their products on the sides of their barns.*

## Fast Facts: Smokeless Tobacco Use

- Even though cigarette smoking has decreased in recent years, use of smokeless tobacco has not. As of 2020, about 3.8 percent of American adults use smokeless tobacco products.
- American men are more likely to use chewing tobacco (6.8 percent) than women are (1 percent).
- An estimated 4.1 percent of high-school students are current smokeless tobacco users. Smokeless tobacco use is much more common among male than female high-school students (6.8 percent versus 1.3 percent).
- Among high-school students, smokeless tobacco use is highest among American Indian or Alaska Natives (9.2 percent), followed by whites (5.7 percent), Native Hawaiian or Pacific Islanders (5.3 percent), Hispanics (2.2 percent), Blacks (0.9 percent), and Asians (0.7 percent).
- An estimated 2.2 percent of middle-school students use smokeless tobacco.

While smokeless tobacco remains nowhere near as popular as vaping, attempts to decrease its spread have been impacted by people who not only use smokeless tobacco but who also vape or smoke cigarettes at the same time.

## DUAL USE IS PARTICULARLY PROBLEMATIC

Many smokeless tobacco users also ingest nicotine in another way as well, such as smoking cigarettes or vaping. This practice is known as dual use of tobacco. Although tobacco chewers may not engage

in this type of dual use very often, doing so can be a problematic and dangerous habit that can put their health at risk.

For example, dual use may increase a person's risk of nicotine poisoning by increasing the number of sources from which they get this drug. That's because even tobacco companies know that nicotine, at a high enough level, can cause dangerous reactions. So, they limit the amount that they use in each product. As a result, combining multiple sources can increase the level of nicotine in a person's system quickly.

Just as problematic, dual use of smokeless tobacco and other nicotine products increases the risk of cancer and other health



*Tobacco plants grow on a farm in Virginia. The plants grow best in areas that are warm and dry.*

problems. It's all a question of the concentration of nicotine in a person's body. Heavy abuse triggers a multitude of health problems that only get worse as the concentration increases. As a result, the simultaneous use of smokeless tobacco products along with other nicotine-containing products—particularly chewing while smoking—is a particularly bad idea.

This type of abuse seems to be more common in younger users. “Dual users were more likely to be younger, reside in nonmetropolitan statistical areas (MSA) and outside the Northeast United States,” noted a 2018 study published in the journal *Nicotine and Tobacco Research*. “Dual users did not differ significantly from exclusive smokers on most smoker characteristics, including number of past-year quit attempts.”

The same report also states that some may use smokeless tobacco as a way to help them quit using other forms of tobacco, particularly cigarettes. “Smokers who use [smokeless tobacco] are more likely than exclusive smokers to attempt to quit smoking cigarettes using other tobacco products. These findings may be attributed to increasing use prevalence of novel products.” The same thing is often said of those who vape and smoke at the same time—and the study only stated that users were more likely to attempt to quit. The actual number of people who successfully quit smoking by using smokeless tobacco was not mentioned. It went on to state that more research needs to be done on this process to get an idea not only of its success rates but also of the dangers that it may cause to those engaging in such practices.

As a result, it is hard to argue for the use of smokeless tobacco as a cessation tool. While it is true that it may have some benefits for some people, the risks that dual-use puts on a person make it much too risky for many to consider. Thankfully, many types of treatment methods are available for those who are addicted to nicotine. But do these methods work at providing a high level of recovery?



## TEXT DEPENDENT QUESTIONS

1. What socioeconomic factors influence smokeless tobacco use?
2. How does smokeless tobacco increase cancer risk?
3. Is dual-use of tobacco products a good idea?



## RESEARCH PROJECT

Reach out to a doctor in your area, and talk to them about the number of cancer cases they've seen due to smokeless tobacco. Are these numbers higher than those they've seen with cigarette or cigar use? Just as importantly, has the doctor seen any cases of dual-use among their patients? Have they found that smokeless tobacco helps with cessation? Or do they believe that it hurts people trying to quit? Now, find people whom you know who use smokeless tobacco, and ask them whether they know about the increased cancer risk. How many of them were surprised by this information?



*Treatment of smoking-related illnesses in the United States costs more than \$300 billion each year, according to the Centers for Disease Control and Prevention.*



## WORDS TO UNDERSTAND

**adverse:** referring to something that is negative or harmful to a person's health

**efficacy:** the effectiveness of a medical therapy or psychological treatment

**pharmacotherapy:** a medical treatment that involves the use of drugs

# The Statistics on Treatment and Recovery

Although people may not realize it, there are many different treatment options that can help people quit using nicotine. These options are designed primarily for quitting cigarettes and vaping, although they can also be used to manage problems such as smokeless tobacco use. The methods used typically break down into two different categories, including behavioral adjustments and medications.

Each of these categories has different benefits and disadvantages that make them a good choice for certain people. Just as importantly, it is critical to know how effective these strategies can be when properly utilized. That's because addiction treatment success rates often vary, depending on the person who goes through the care, and their level of their dependence on nicotine and other substances.

Readers may be disappointed to see that these success rates are not as high as they may want. That's not unusual—no treatment for any disease has a 100 percent success rate. However, each of these medication options is advantageous in many situations, and anyone who is suffering from addiction to nicotine may want to read through this section to understand their chances of success.

# TREATMENT OPTIONS FOR TOBACCO ADDICTION

Over the years, medical professionals have created a multitude of care options for nicotine therapy. Effective treatments include both behavioral therapies and FDA-approved **pharmacotherapies**, such as bupropion and varenicline. “Research indicates that smokers who receive a combination of behavioral treatment and



Many people use nicotine replacement therapy to get through the early stages of quitting cigarettes. Studies have shown that NRT increases quit rates by 50 to 70 percent. Products for nicotine replacement therapy (NRT) come in a variety of forms that are available without a prescription, including skin patches, oral spray, gum, and lozenges.

## Fast Facts: Cigarettes and General Health

- Smoking harms nearly every organ of the body and affects a person's overall health.
- Older women who smoke have weaker bones than women who have never smoked. They are also at greater risk for broken bones.
- Smoking affects the health of a person's teeth and gums and can cause tooth loss.
- Cigarette smokers are at a higher risk for cataracts and age-related vision problems.
- The risk of developing type 2 diabetes is 30 to 40 percent higher for cigarette smokers than for nonsmokers.
- Smoking causes rheumatoid arthritis, inflammation, and decreased immune function.

cessation medications quit at higher rates than those who receive minimal intervention,” notes the National Institute on Drug Abuse. “Interventions such as brief advice from a health care worker, telephone helplines, automated text messaging, and printed self-help materials can also facilitate smoking cessation. Cessation interventions utilizing mobile devices and social media also show promise in boosting tobacco cessation. It is important for cessation treatment to be as personalized as possible, as some people smoke to avoid negative effects of withdrawal while others are more driven by the rewarding aspects of smoking.”

Behavioral treatments of this type include a myriad of different adjustments that help make it easier for a person to quit smoking. For example, cognitive behavioral therapy (CBT) helps to identify abuse

triggers that a person may experience that make them use nicotine. These triggers include stress, other people who smoke, and various situations that make their body crave nicotine.

Motivational interviewing is another care option that helps many people. This process involves talking to a counselor who asks simple questions to the patient to figure out why they smoke. These non-confrontational methods help to provide an easy way of overcoming addiction to nicotine. Studies find that intervention of this type typically helps to produce higher cessation rates than other types of brief advice or standard care methods.



*Varenicline, sold under the trade name Chantix, helps reduce nicotine cravings by stimulating the same brain receptors that nicotine does, just to a lesser degree. Coupled with counseling and group therapy, this powerful medicine increases a nicotine addict's odds of successfully quitting.*

Combined with mindfulness, these simple methods can help many understand why they smoke and also to work to quit and stay as healthy as possible. Mindfulness requires a person to track how they feel on a moment-by-moment basis. They then learn how to tweak their life in ways that minimize severe injury or withdrawal symptoms. Although more medical trials are necessary, the ones that have been done show early promise for this treatment option.

Although these behavioral options may be good enough for many people to quit, others may need more sustained medical help. For example, nicotine-replacement therapy has been shown to increase cessation rates from 50 to 70 percent in those who use these tools properly. These options include medical patches, sprays, gums, and lozenges that use concentrated nicotine to wean a person off of nicotine use. People can use these therapies for up to 24 weeks. Importantly, vaporizers are not considered medically appropriate for nicotine-replacement therapy.

Beyond nicotine replacement, there are other medications that can help manage addiction to nicotine and other tobacco products. These include bupropion, an anti-depressant that helps to enhance quit rates in both short- and long-term situations. However, there are similar potential **adverse** side effects to other types of anti-depressants, such as mood swings and even suicidal thoughts.

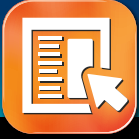
Varenicline is another popular nicotine treatment method that helps people to quit using tobacco products. Patients who used this treatment and combined it with group therapy were more likely to keep abstaining from nicotine, particularly when combined with nicotine-replacement therapy methods. Some other anti-depressants have also shown some success, such as fluoxetine, paroxetine, and sertraline. Other promising options include focusing on neuroreceptors that interact with nicotine, and blocking their ability to absorb the drug. These include N-acetylcysteine, a drug that was originally developed to treat overdoses of acetaminophen but

has shown promise as a treatment for nicotine dependence as well. However, more testing is required before this drug can be approved for therapeutic use. Other options, such as transcranial magnetic stimulation—which may sound like sci-fi treatment—have shown some benefits in decreasing the urge to use nicotine and tobacco products.

Although this section touched a little on the success rates of these varying types of treatments, the next section will discuss them in more depth. Anyone who is considering these care options needs to



*Group therapy and counseling sessions, in which addicts discuss their experiences, are often a component of drug rehabilitation programs.*



## DISCOVERING THE RISK OF SMOKING

Until the late nineteenth century, cases of lung cancer were fairly rare. People who had lung cancer were often misdiagnosed as having tuberculosis, pneumonia, or another lung disease. In 1898, a young German medical researcher named Hermann Rottman proposed that tobacco dust (not smoke) might be causing tumors in the lungs of some people who worked in the tobacco industry. Fourteen years later, in 1912, an American doctor named Isaac Adler proposed that smoking could be contributing to the growing problem of lung cancer. Adler was the first to make this association in the medical literature, but it would be decades before the link between smoking and cancer was fully accepted by mainstream medical scientists.

continue on with this chapter to ensure that they are successful with their treatment. Just as importantly, they can use this information to decide whether they need professional treatment.

## SUCCESS RATES FOR VARIOUS TREATMENTS

The first step toward cessation is to get professional advice from a professional. “The value of a medical provider’s brief advice to quit smoking is supported by decades of research,” write nicotine researchers Judith J. Prochaska and Neal L. Benowitz. “A meta-analysis of 29 studies determined that relative to no treatment, brief

*To learn how the body recovers after quitting nicotine, scan here.*



provider advice doubled the likelihood of a patient abstaining from smoking out to five months follow-up.”

Prochaska and Benowitz also report that individual or group therapy was a good choice for a broad range of individuals. They found that success rates, particularly for extended treatment, was an effective way to quit abusing tobacco and other types of nicotine products. They also suggest options such as “quitlines,” although they mention that these methods are usually good only as temporary solutions and shouldn’t be considered ways to quit smoking permanently.

Other options tested include online cessation programs, such as those integrated on the Smokefree.gov website. These trials found that people who used these groups had a quit rate of about 34 percent, which is not huge but an advancement past those who used no types of treatment at all. Further examination of text-based

interventions—which included daily and then weekly messages—found a success rate of 9.2 percent, which is fairly low compared to similar options.

Perhaps surprisingly, even social media sites can be used to help with some types of cessation. They may be leveraged into a powerful care option that may benefit those who visit them daily. The exact nature of this care is still being tested to see whether it is effective or not.

Of the nicotine-replacement therapy options, it was found that compliance and success rates were much better with patches than with other types of treatment options. For example, gum was the next successful option, followed by sprays and inhalers. Typically, those who stayed on the nicotine patch for twenty-four weeks found the most success, while those who used inhalers were very rarely successful by comparison.

### **Fast Facts: The Benefits of Quitting**

- Quitting smoking cuts cardiovascular risks. Just one year after a person quits smoking, their risk of a heart attack drops sharply.
- Two to five years after quitting smoking, a person's risk of a stroke may reduce to about that of a nonsmoker's.
- Five years after quitting smoking, a person's risk of developing cancers of the mouth, throat, esophagus, or bladder drop by half.
- Ten years after quitting, a person's risk of dying from lung cancer drops by half.

Bupropion provided a surprising rate of success when compared to other methods. When used for one year, cessation rates jumped from 42 percent to as high as 55 percent. Sustained use of this substance was necessary—people who quit or who tried to decrease their dosage often found that it was much more difficult to stay successful when using this treatment option.

As for varenicline, it was found that cessation rates over six months were about 23 percent, compared to the 15 percent found with bupropion over the same period. This success rate significantly



*When the urge to use nicotine products occurs, substituting positive recreational activities with friends can help a person to resist the craving to smoke or vape.*

increases for both after a year, as noted earlier. Varenicline was particularly beneficial for those with problems like schizophrenia and other types of mental health problems.

However, a combination of nicotine replacement and other types of medical options was typically the most productive method available. It was found that rates of cessation jumped from 29 percent to 38 percent with a combination approach, compared to using just medication or just nicotine-replacement therapy. However, gradual reduction in nicotine consumption was also beneficial, particularly when combined with varenicline. Over a one-year period, the success rate jumped from less than 10 percent to 27 percent.

Clearly, these results indicate that a sustained and multifaceted approach is critical for anyone attempting to quit using nicotine products. Just as importantly, a growing trend toward enhancing existing care options has been in motion for several years. These options could be beneficial when they are ready, although many of them are still in the earliest stages of testing and confirmation.

## WAYS TO ENHANCE THESE TREATMENTS

Over the years, many types of pharmacotherapies have become popular for treating nicotine addiction. But a growing number of medical therapists are now working to increase the success rates of the methods previously mentioned. These treatment options rarely have more than a success rate over 50 percent or so—which is better than no treatment, but still disappointing.

Some may believe that this low level of **efficacy** means that a person doesn't need this type of treatment. But remember: the success rates mentioned above are specific to a care option implemented only for a six- to twelve-month period, and success rates skyrocket when a person has successfully quit smoking for two years. Researchers are attempting to find care options that get people

# EVERY TRY COUNTS™

Quitting smoking is possible. If you've tried to quit, congratulations, that alone is a big achievement. It may take several tries to be successful, and you learn something every time you try to quit smoking. By taking small steps, you can learn what works for you. Every try counts. Start here.



## TRY A TEXT PROGRAM TO QUIT

Try a text message program that fits where you are in your quit journey. You'll receive texts with tips and encouragement to keep you on track.

You haven't failed if you keep trying.

### HOW DO YOU FEEL ABOUT QUITTING TODAY?

CHOOSE **1** OF OUR TEXT MESSAGE PROGRAMS TO HELP YOU QUIT

#### I WANT TO TRY A SMALL STEP

Help me build skills to try quitting

#### I WANT TO PRACTICE QUITTING

Try it for a few days

#### I'M READY TO QUIT FOR GOOD

Set a quit date

*All fifty states, as well as the federal government, offer toll-free telephone numbers ("quitlines") where people can speak with smoking cessation counselors. Studies have shown that smokers who call these "quitlines" benefit from the information and support provided. More information is available online at <https://smokefree.gov/>.*

to that stage more quickly and efficiently. They point to the fact that the global prevalence of smoking—around 23 percent—has remained almost unchanged for decades.

“Stagnant smoking rates can be linked to two factors: 1) incidence rates for quit attempts have not changed, and 2) low overall use of evidence-based treatment among smokers attempting to quit,” explained an article in the medical journal *Drugs*. “U.S. National Health Interview Survey (NHIS) data suggest that only 40 percent of smokers make a quit attempt annually, a rate that did not change

throughout the first decade of the twenty-first century, though more recent reports suggest this statistic may be improving. Among smokers who do make a quit attempt, most evidence, inclusive of studies of smokers beyond the U.S., suggests that use of counseling and pharmacotherapy to quit smoking is modest at best.”

This study goes on to state that almost two-thirds of smokers trying to quit do not use counseling or medical treatment, which could represent a serious problem. If only around 33 percent of all smokers go through this type of treatment, and only 50 percent succeed when they do, the overall cessation success rate will remain low for many years. Researchers suggest working with education-based options—intervention at a young age for young potential smokers—and combining them with medicines and various types of



*Cognitive behavioral therapy is a form of treatment that helps patients to identify the people, places, and situations that trigger their nicotine use. Patients are taught relaxation skills and effective coping strategies that can help them avoid reaching for a cigarette when they encounter triggers or stressful situations.*

behavioral adjustments. It also suggests that smokers make more frequent attempts to quit and not only to use over-the-counter options but also to try out prescription-based methods. Researchers are currently attempting to find better nicotine-blocking medicines that make it more difficult for the body to absorb this drug. Increased regulation attempts—which vary by country—are also critical for stopping the spread of tobacco abuse throughout the world.

Current options being explored include alternative cessation—which focuses on quitting and using again in a controlled manner—and higher nicotine-replacement therapy doses. Just as importantly, more advanced scientific methods—such as examining the brainwaves of those who suffer from addiction to nicotine and adjusting them—are in the very early stages of testing.

As a result, it is critical for those who are addicted to nicotine to follow any advances that may occur in the future. Doing so is a wise decision, because it can provide the type of treatment efficiency that a person needs to overcome addiction. And it can also help them reach out to others who may suffer from addiction and give them the attention necessary to stay nicotine free for good.



## TEXT DEPENDENT QUESTIONS

1. What are the two most common care options for nicotine addiction?
2. How does behavioral therapy help a person?
3. Is nicotine-replacement therapy the same as vaping?



## RESEARCH PROJECT

Go to a pharmacy with a parent, and look at the different nicotine-replacement options available in the shop. Talk to a pharmacist or assistant about how often these products sell. Do they see the same people coming to buy these items regularly? Or are there new people coming to buy them every month? Ask them about prescription nicotine treatments. Do they find that these medicines keep getting refilled, or do people give up on them after a while? Why do you think the pharmacy noticed these findings? Brainstorm influences, such as your geography and the types of people who live in your town.



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## SERIES GLOSSARY OF KEY TERMS

**Addiction**—a complex condition in which a person experiences an overpowering desire to use a substance, such as nicotine, despite its harmful consequences. Today, most scientists consider addiction to be a disease of the brain.

**Carbon monoxide**—a colorless, odorless highly poisonous gas found in tobacco smoke and in the lungs of people who have recently smoked, or (in smaller amounts) in people who have been exposed to tobacco smoke.

**Carcinogen**—a substance that damages the growth of cells, increasing the likelihood that cancer will develop.

**E-cigarette**—an electronic smoking device (including a vape or JUUL) that heats and vaporizes a liquid solution containing nicotine. The aerosol vapor is inhaled by the user when they draw on the device, as they would a regular tobacco cigarette, and the user exhales the aerosol into the environment.

**Nicotine**—an alkaloid derived from tobacco, responsible for the psychoactive and addictive effects of smoking.

**Secondhand aerosol**—emission from e-cigarettes and vaping devices that contains nicotine as well as low levels of cancer-causing toxins, which can be breathed by those around the device user.

**Secondhand smoke**—a mixture of smoke exhaled by smokers and smoke released from smoldering cigarettes, cigars, pipes, bidis, or other smoking materials. The smoke mixture contains gases and particulates, including nicotine, carcinogens, and toxins. Also known as “passive smoke” or “environmental tobacco smoke” (ETS).

**Tobacco**—the name for the dried leaves of the plant *Nicotiana tabacum*, which are rich in the alkaloid nicotine and can be smoked or chewed.

**Tolerance**—a condition that occurs when a user of an addictive substance no longer responds to the drug and requires higher dosages to achieve the same effect.

**Withdrawal**—a term for a group of unpleasant side effects that occur when a drug addict stops taking a particular substance such as nicotine. Symptoms of nicotine withdrawal can include fatigue, headache, irritability or depression, strong cravings to smoke, constipation, and anxiety.



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# INTERNET RESOURCES

**[https://www.cdc.gov/tobacco/data\\_statistics/fact\\_sheets/cessation/quitting/index.htm](https://www.cdc.gov/tobacco/data_statistics/fact_sheets/cessation/quitting/index.htm)**

The Centers for Disease Control and Prevention (CDC) provides health-related information on its website, including tips to help people quit smoking and live without vaping or nicotine.

**<https://truthinitiative.org>**

The anti-smoking organization Truth Initiative helps to educate people about the dangers of nicotine and tobacco products.

**<https://www.drugabuse.gov/publications/drugfacts/cigarettes-other-tobacco-products>**

The National Institute on Drug Abuse provides information about nicotine, as well as links to other useful articles about this drug.

**<https://www.who.int/tobacco/media/en/TobaccoExplained.pdf>**

This lengthy document details the attitudes of the tobacco industry over the years, as well as the industry's attempt to hide the truth about the dangers of using tobacco products.

**<https://www.lung.org/stop-smoking/join-freedom-from-smoking>**

Information about the American Lung Association's Freedom from Smoking program is available at this website.

**<https://www.samhsa.gov/find-help/national-helpline>**

The Substance Abuse and Mental Health Services Administration (SAMHSA) provides resources for helping people suffering from nicotine addiction.

**<https://nicotine-anonymous.org/>**

Nicotine Anonymous is an organization formed to help people who are trying to quit using tobacco products. The organization's website includes information about local support groups.

**<https://www.who.int>**

Each year, the World Health Organization sponsors World No Tobacco Day to empower young people to engage in the fight against Big Tobacco. The event usually takes place late in May.

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