

A close-up photograph of a hand firmly crushing several cigarettes on a white surface. The hand is positioned in the center, with fingers curled around the cigarettes. The cigarettes are broken, with some ash and tobacco scattered around. The background is a plain, light-colored surface. The bottom of the image features a dark red diagonal band.

Tobacco and Oral Health

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I. How Tobacco Affects Oral Health

Introduction

Tobacco use is a primary cause of oral disease and many chronic health conditions. No matter how it is consumed, tobacco can take a heavy toll on the human body.

The leading preventable cause of death worldwide, tobacco contributes to a wide array of health conditions, including:

- Stroke
- Heart attack
- Lung diseases, such as emphysema and chronic bronchitis
- Cancer

Nicotine is dangerously addictive, yet it's not the only substance of concern in tobacco. Tobacco products contain as many as 600 different ingredients, of which at least 70 are known carcinogens. This lethal combination increases cancer risk in nearly every organ system.

Some of the most salient impacts of tobacco are seen in the mouth. This eBook provides information about tobacco and oral health and how your dentist can help you manage these risks.

Cavities

The toxic chemicals contained in tobacco dry out the mouth by interfering with the salivary glands. As a result of this reduced salivary flow, plaque can accumulate more rapidly on the teeth and gums. Plaque carries live bacteria, or biofilms, that damage the enamel and cause tooth decay. Over time, plaque calcifies into dental calculus, which can only be removed by a dental professional.



Studies have shown that nicotine accelerates the formation of *S. mutans*, a key bacteria associated with dental caries. When *S. mutans* biofilms are exposed to nicotine, they become thicker and more metabolically active. This may explain why tobacco users tend to experience higher rates of dental decay compared to the general population.

Gum Disease

Gingivitis, the mildest form of gum disease, is caused by dental plaque that accumulates on the teeth along the gum line. Symptoms of gingivitis include red, swollen gums that bleed easily. If gingivitis is not treated, it can advance to periodontitis, also known as periodontal disease. Periodontitis results in a loss of connective tissues and supportive bone over time, which eventually causes teeth to fall out. Gum disease is the most common reason for tooth loss, according to the [National Institute of Dental and Craniofacial Research](#).

Tobacco use has an enormous influence on the development, progress, and treatability of periodontal disease. Tobacco interferes with the functioning of gum tissue cells, making the gums more vulnerable to detachment from the teeth. The presence of tobacco in the body also affects immune function, which impairs the body's ability to recover from periodontitis.

Unfortunately, smoking often masks the symptoms of periodontitis. Because tobacco decreases blood flow to the gum tissues, gum bleeding may not be visible. Many people don't get the treatment they need until very late as a result. Stopping tobacco will immediately lower risk for gum disease and improve your body's response to treatment.



Oral Cancer

Tobacco use accounts for at least 30% of all cancer deaths in the United States. A few examples of the toxic chemicals contained in tobacco are:

- Arsenic – found in rat poison
- Carbon monoxide – released in automobile exhaust fumes
- Tar –material for paving roads
- Cadmium –active ingredient in battery acid
- Benzene –used in rubber cement
- Lead – contained in batteries
- Nicotine – used as insecticide

Cigars, pipes, spit, cigarettes, and all types of smokeless tobacco cause cancer, especially oral cancer. That's because all of these methods introduce carcinogens directly into the oral tissues, where they are absorbed by oral cells:

- Poisons in tobacco can damage a cell's DNA, which controls cell growth and function. When DNA is altered, a cell can begin to grow out of control and develop into a tumor.
- Poisons in tobacco weaken the body's immune system, inhibiting its ability to kill the cancerous cells. When this occurs, the cancer cells can continue to grow.

The good news: eliminating tobacco immediately reduces your risk for cancer. In fact, your risk for cancers of the mouth and throat is cut in half within 5 years of quitting.



Tobacco + Alcohol

People who consume alcohol in combination with tobacco are at an even higher risk for oral cancer. Researchers believe that when these substances interact, they heighten each other's adverse effects: alcohol dehydrates the cell walls, which enhances the ability of tobacco carcinogens to enter the oral tissues.

Alcohol abuse is already the second-highest risk factor for oral cancer (when defined as consuming more than 21 drinks weekly). However, it's important to note that any amount of alcohol exposure increases risk for cancer because of the way it is processed in the body. When you drink, the alcohol gets broken down into a chemical called acetaldehyde. Like tobacco, acetaldehyde damages DNA and prevents the immune system from repairing that damage, increasing the likelihood of forming cancerous tumors. Thus, if you smoke, it is especially recommended that you limit alcohol intake.

What About Vaping and Smokeless Tobacco Products?

Vaping refers to the aerosol vapor produced by an e-cigarette or similar devices. Though e-cigarettes do not contain tobacco smoke, they are no less dangerous. The aerosol vapor consumed when vaping consists of fine particles containing toxic chemicals.

Research shows that when teeth exposed to the vegetable glycerin and flavoring in vaping aerosol carry 4x the amount of bacteria of non-exposed teeth. An upsurge in the popularity of e-cigarettes, especially among young people, has been associated with a rise in oral health problems. Scientists are finding that the vapors damage the DNA can damage the mucous lining of your mouth. Over time, these changes cause inflammation and may trigger the development of cancer. People who use e-cigarettes are at greater risk for gum disease, tooth loss, and oral cancer.



Smokeless tobacco is not a safe alternative to cigarettes for oral health either. In fact, chewing tobacco appears to affect the teeth more than any other tobacco type. Because it contains sugar and is held at the tooth root for long periods of time, chewing tobacco carries a higher risk for tooth decay.

II. Quitting Tobacco

What's the Key to Successful Cessation?

It's clear that quitting tobacco greatly reduces the risk of developing a variety of tobacco-related diseases, oral conditions, and cancer. Nicotine dependence often requires repeat treatments due to its highly addictive nature. However, tobacco users can and do quit. In fact, today there are more former smokers than current smokers, according to a [report from the Centers for Disease Control and Prevention](#).

The majority of tobacco users want to quit, and about half try to quit permanently within a given year. However, [only 6% are successful](#). Most will make multiple attempts before they can stop permanently. So what makes the difference?

While some smokers will quit without help, [the data](#) shows that certain treatment methods are more effective than others:

CESSATION METHOD	INCREASED PROBABILITY OF QUITTING SUCCESSFULLY
BRIEF COUNSELING BY A DOCTOR	66%
GROUP BEHAVIORAL THERAPY	98%
TELEPHONE COUNSELING	
NICOTINE REPLACEMENT THERAPY (NRT)	
PRESCRIPTION DRUGS TO TREAT ADDICTION:	
VARENICILINE	
BUPROPION	
CLONIDINE	
NORTRIPTYLINE	

Figures are taken from the Tobacco-Free Initiative of the [World Health Organization](#).



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People respond differently to different methods, so don't be discouraged if you don't succeed the first time. Getting support in the form of counseling, group therapy, NRT, prescription medications, or some combination of these can make all the difference.

What You Do Matters

It's also important to note that reducing the amount of tobacco you consume will lower the risk and severity of oral conditions.

For example, if you currently smoke a pack of cigarettes a day, even cutting down to half a pack a day can make a difference. Visiting the dentist more often will also help manage the inevitable impacts of tobacco on your teeth, gums, and oral tissues. Whether or not you notice symptoms, you should visit the dentist for professional dental cleanings at least twice a year. Having your teeth and gums cleaned by a dental professional will help to impede the more rapid plaque buildup associated with tobacco use.



Involving Your Dentist

Quitting tobacco is the single best thing you can do to promote your oral and overall health. Your dentist should be a trusted partner who you can talk to about your tobacco use and any plans to quit:

- **Don't be afraid to be honest** with your dentist about how much and how often you use tobacco products. We understand that nicotine is a powerful addiction and our goal is to help you to have the best oral health possible. Knowing as much as we can about your daily usage will allow us to give you accurate recommendations for your oral care.
- **Follow the dentist's recommendations for visits.** If you currently use tobacco, it is very important to make appointments as directed by the dentist to prevent cavities and gum disease from progressing. These visits also provide an opportunity for the dentist to perform oral cancer screenings. While no one wants to imagine that they might develop oral cancer, early detection is key to successful treatment.
- **Ask for advice if you are thinking about quitting.** We encourage you to talk openly with your dentist about your plans to quit using tobacco. Depending on where you are in this process, the dentist can provide useful information about cessation and point you to helpful resources. The dentist may be able to prescribe medications to support your tobacco cessation.



Your Partners at Penn Dental Medicine

As a leading institution in research and patient care, Penn Dental Medicine provides quality dental services through our team of faculty and student dentists. We understand the unique oral health challenges faced by our patients who consume tobacco. The process of quitting tobacco can be long and difficult for some, which is why it is so important to have trusted partners to support your oral care. At Penn Dental Medicine, you'll enjoy the best the field has to offer in terms of quality care and state-of-the-art technology, all at very affordable rates. As a dental school, we charge at rates far lower than you'll find at the average private practice without sacrificing our high standard of care.

Quite simply, we meet patients where they are. Our team will do all we can to promote your oral health, including cessation support if requested. To [schedule an appointment](#) with one of our caring professionals, please give us a call at 215-898-8965.

