Oral Cavity and Oropharyngeal Cancer Causes, Risk Factors, and Prevention

Learn about the risk factors for cancers of the oral cavity (mouth cancer) and oropharynx (throat cancer) and what you might be able to do to help lower your risk.

Risk Factors

A risk factor is anything that increases your chance of getting a disease such as cancer. Learn more about the risk factors for oral cavity and oropharyngeal cancer.

Prevention

There's no way to prevent all oral cavity and oropharyngeal cancers. But there are things you can do that might help lower your risk. Learn more here.

Risk Factors for Oral Cavity and Oropharyngeal Cancers

- Tobacco and alcohol use
- Human papillomavirus (HPV) infection
- Sex
- Excess body weight
- Age
- Ultraviolet (UV) light
- Poor nutrition
- Genetic syndromes
- Unproven or controversial risk factors

A risk factor is anything that increases a person's chance of getting a disease such as cancer. Different cancers have different risk factors. Some risk factors, like smoking, can be changed. Others, like a person's age or family history, can't be changed.

But risk factors don't tell us everything. Having a risk factor, or even many, does not mean that a person will get the disease. And many people who get the disease have few or no known risk factors.

Oral cavity and oropharyngeal cancers are often grouped with other cancers in the head and neck area. These cancers often have many of the same risk factors listed below.

Tobacco and alcohol use

Tobacco use is one of the strongest risk factors for head and neck cancers, including oral cavity and oropharyngeal cancer. The risk for these cancers is much higher in people who smoke than in people who don't. Most people with these cancers have a history of smoking or other tobacco exposure, like chewing tobacco. The more you smoke, the greater your risk. Smoke from cigarettes, pipes, and cigars all increase your risk of getting these cancers. Some studies have also found that long-term exposure to secondhand smoke might increase the risk of these cancers, but more research is needed to confirm this. Pipe smoking is linked to a very high risk for cancer in the part of the lips that touch the pipe stem.

Oral tobacco products[1] (snuff, dip, spit, chew, or dissolvable tobacco) are linked with cancers of the cheek, gums, and inner surface of the lips. Using oral tobacco products for a long time is linked to a very high risk. These products also cause gum disease, destruction of the bone sockets around teeth, and tooth loss.

When diagnosed with oral cavity or oropharyngeal cancer, **it's important for people who smoke or use oral tobacco, to quit smoking and quit all oral tobacco**

products. People who continue to smoke while getting cancer treatment can have trouble with wound healing, more side effects from radiation therapy or chemotherapy, a higher risk of infection, and worse outcomes. Also, continuing to smoke and use oral tobacco products after cancer treatment, greatly increases the risk of developing a second cancer[2] in the mouth, throat, larynx (voice box), lung and other organs.

If you are thinking about quitting tobacco and need help, call the American Cancer Society at 1-800-227-2345. A tobacco cessation and counseling program can help increase your chances of quitting for good. See How to Quit Smoking or Smokeless Tobacco[3] for more information.

Drinking alcohol increases the risk of developing oral cavity and oropharyngeal cancers. Heavy drinkers have a higher risk than light drinkers.

Smoking and drinking alcohol together multiplies the risk of these cancers. The risk of these cancers in people who drink and smoke heavily is about 30 times higher than the risk in people who don't smoke or drink.

Betel quid and gutka

In Southeast Asia, South Asia, and certain other areas of the world, many people chew betel quid, which is made up of areca nut (betel nut), spices, lime, and other ingredients. Many people in these areas also chew gutka, a mixture of betel quid and tobacco. People who chew betel quid or gutka have an increased risk of cancer of the mouth.

Human papillomavirus (HPV) infection

Human papillomavirus (HPV) is a group of more than 150 types of viruses. They're called **papillomaviruses** because some of them cause a type of growth commonly called a papilloma or wart.

Infection with certain types of HPV can cause some forms of cancer, including cancers of the penis, cervix, vulva, vagina, anus, mouth, and throat. HPV type 16 (HPV16) is the type most often linked to cancer of the oropharynx, especially those in the tonsil and base of tongue. HPV DNA (a sign of HPV infection) is found in about 2 out of 3 oropharyngeal cancers and in a much smaller portion of oral cavity cancers.

The number of oropharyngeal cancers linked to HPV has risen greatly over the past few decades. These cancers are becoming more common in younger people who have a history of multiple sex partners (including oral sex) and no history of alcohol abuse or tobacco use. Oropharyngeal cancers linked to HPV infection tend to have better

outcomes (prognoses) than tumors not caused by HPV because chemotherapy and radiation treatments work better for these cancers. This improvement in outcome however is not seen in people with HPV-related oropharyngeal cancers who also smoke.

See HPV (human papillomavirus)[4] to learn more about HPV and vaccines to prevent HPV infection.

Sex

Oral cavity and oropharyngeal cancers are twice as common in men than in women. This might be because men have been more likely to use tobacco and alcohol in the past. HPV-related oropharyngeal cancers are also seen more often in men.

Excess body weight

Having too much body weight appears to increase the risk of cancers of the oropharynx and larynx[5]. Eating more plant-based foods, such as nonstarchy vegetables and whole fruit, might help people lose weight as well as reduce their risk of oropharyngeal and laryngeal cancer from poor nutrition.

Age

Cancers of the oral cavity and oropharynx usually take many years to develop, so they're not common in young people. Most patients with these cancers are older than 55 when the cancers are first found. HPV-linked cancers tend to be diagnosed in people younger than 50.

Ultraviolet (UV) light

Sunlight is the main source of UV light for most people. Cancers of the lip are more common in people who have outdoor jobs where they are exposed to sunlight for long periods of time.

Poor nutrition

Several studies have found that a diet low in fruits and vegetables is linked with an increased risk of cancers of the oral cavity and oropharynx.

Genetic syndromes

People with syndromes caused by inherited defects (mutations) in certain genes[6] have a very high risk of mouth and middle throat cancer.

- **Fanconi anemia:** People with this syndrome often have blood problems at an early age, which may lead to leukemia[7]or myelodysplastic syndrome[8]. They also have a very high risk of cancers of the mouth and throat.
- **Dyskeratosis congenita:** This is a genetic syndrome that can cause aplastic anemia, skin rashes, and abnormal fingernails and toenails. People with this syndrome also have a very high risk of developing head and neck cancers, especially of the mouth and throat, at a young age.

Unproven or controversial risk factors

Mouthwash

Some studies have suggested that mouthwash with a high alcohol content might be linked to a higher risk of oral and oropharyngeal cancers. But recent research has questioned these results. Studying this possible link is complicated by the fact that people who smoke and frequent drinkers (who already have an increased risk of these cancers) are more likely to use mouthwash than people who neither smoke nor drink.

Irritation from dentures

It's been suggested thatlong-term irritationof the lining of the mouth caused by poorly fitting dentures is a risk factor for oral cancer. But many studies have found no increased risk in denture wearers overall.

Poorly fitting dentures can tend to trap agents that have been proven to cause oral cancer, such as alcohol and tobacco particles, so denture wearers should have them checked by a dentist regularly to ensure a good fit. All denture wearers should remove their dentures at night and clean and rinse them thoroughly every day.

Oral health

Studies have suggested the overall health of the mouth, teeth, and gums may impact oral cavity and oropharyngeal cancer risk because of changes in the normal bacteria in the mouth. Poor oral hygiene, which can lead to tooth loss, may also be linked to these

cancers. Overall survival may also be affected. More research is needed, but regular dental visits, as well as brushing and flossing, may lessen these risks and have many other health benefits, too.

Hyperlinks

1. www.cancer.org/cancer/risk-prevention/tobacco/health-risks-of-tobacco/smokeless-tobacco.html
2. www.cancer.org/cancer/types/oral-cavity-and-oropharyngeal-cancer/after-treatment/second-cancers.html
3. www.cancer.org/cancer/risk-prevention/tobacco/guide-quitting-smoking.html
4. www.cancer.org/cancer/risk-prevention/hpv.html
5. www.cancer.org/cancer/types/laryngeal-and-hypopharyngeal-cancer.html
6. www.cancer.org/cancer/risk-prevention/genetics/family-cancer-syndromes.html
7. www.cancer.org/cancer/types/leukemia.html
8. www.cancer.org/cancer/types/myelodysplastic-syndrome.html

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What Causes Oral Cavity and

Oropharyngeal Cancers?

- Tobacco and alcohol and oral or oropharyngeal cancers
- Human papillomavirus (HPV) and oral or oropharyngeal cancers
- Inherited or acquired gene mutations and oral or oropharyngeal cancers

Doctors and scientists can't say for sure what causes each case of oral cavity or oropharyngeal cancer. But they do know many of the risk factors and how some of them may lead to cells becoming cancer.

For human cells to be made, this mostly depends on the information in the cells' DNA. DNA is the chemical in our cells that makes up our genes, which control how our cells work. We look like our parents because they are the source of our DNA. But DNA affects more than just how we look.

Some genes control when cells grow, divide, and die:

- Genes that help cells normally grow, divide, and stay alive are called **proto-oncogenes**. When a proto-oncogene mutates (changes), the gene becomes abnormal and is then called an **oncogene**.
- Genes that help keep cell growth under control or make cells die at the right time are called **tumor suppressor genes**.

Cancers can be caused by DNA mutations (gene changes) that turn on oncogenes or turn off tumor suppressor genes. This leads to cells growing out of control. Changes in many different genes are usually needed to cause oral cavity and oropharyngeal cancer.

For more about how genes changes can lead to cancer, see Genes and Cancer[1].

Tobacco and alcohol and oral or oropharyngeal cancers

Scientists believe that some risk factors, such as tobacco or heavy alcohol use, may cause these cancers by damaging the DNA of cells that line the inside of the mouth and throat.

When tobacco and alcohol damage the cells lining the mouth and throat, the cells in this layer need to divide more often and make more copies of themselves. This increases the chance to make mistakes when copying their DNA, which may increase the

possibility of becoming cancer.

Many of the chemicals found in tobacco can damage DNA directly. Scientists are not sure whether alcohol directly damages DNA, but they have shown that alcohol helps many DNA-damaging chemicals get into cells more easily. This may be why the combination of tobacco and alcohol damages DNA far more than tobacco alone. Acetaldehyde, a breakdown product of alcohol, is found in saliva (spit). It has been shown to get in the way of normal DNA repair, as well as disturb other functions of DNA. The level of acetaldehyde goes up as people drink more alcohol which may be one way alcohol damages the cells lining the oral cavity.

This damage can cause certain genes (for example, those in charge of starting or stopping cell growth) to not work well. Abnormal cells can begin to grow out of control, forming a tumor.

Human papillomavirus (HPV) and oral or oropharyngeal cancers

Certain types of human papillomavirus[2] (HPV) infections (mainly HPV16), are important causes of most oropharyngeal (middle throat) cancers. HPV makes 2 proteins known as E6 and E7 which turn off some tumor suppressor genes, such as Rb and p53. In the throat, too much of the E6 and E7 proteins are made. This may allow the cells lining the oropharynx to grow out of control and to develop changes in more genes, which in some cases can lead to cancer.

The number of oropharyngeal cancers caused by HPV infections is going up. They tend to be found in younger people who don’t smoke or drink alcohol, and tend to have a better outcome (prognosis) than throat cancers that are not caused by HPV.

Inherited or acquired gene mutations and oral or oropharyngeal cancers

Some people inherit DNA mutations (changes) from their parents that increase their risk for developing certain cancers. But **inherited** gene mutations are not believed to cause very many cancers of the oral cavity or oropharynx. Even though inherited gene mutations rarely cause these cancers, some people seem to inherit a poor ability to detoxify (break down) certain types of cancer-causing chemicals. These people are more sensitive to the cancer-causing effects of tobacco smoke, alcohol, and certain industrial chemicals.

Acquired gene mutationsare gene changes that usually happen during life, rather than being inherited. These gene mutations often result from exposure to cancer-causing

chemicals, like those found in tobacco smoke. Several different gene changes are probably needed for cancer to develop, and not all of these changes are understood at this time.

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1. www.cancer.org/cancer/understanding-cancer/genes-and-cancer.html
2. www.cancer.org/cancer/risk-prevention/hpv.html

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Can Oral Cavity and Oropharyngeal Cancers Be Prevented?

- Avoid tobacco and alcohol
- Avoid HPV infection/Get the HPV vaccine
- Limit exposure to ultraviolet (UV) light
- Maintain a healthy weight and eating pattern
- Get regular dental checkups

Not all cases of oral cavity (mouth) and oropharyngeal (middle throat) cancer can be prevented, but the risk of developing these cancers can be greatly reduced if you take steps to avoid certain risk factors.

Avoid tobacco and alcohol

Use of tobacco and alcohol are among the most important risk factors for these cancers. Not starting to smoke or use oral tobacco products is the best way to limit the risk of getting these cancers. Quitting tobacco[1] also greatly lowers your risk of developing these cancers, even after many years of use. Heavy alcohol use is a risk factor on its own. It also greatly increases the cancer-causing effect of tobacco. **So it's especially important to avoid smoking and alcohol as well as the combination of alcohol and smoking.**

Avoid HPV infection/Get the HPV vaccine

The risk of human papillomavirus (HPV) infection of the mouth and middle throat is increased in those who have oral sex and multiple sex partners. These infections are also more common in people who smoke, which may be because the smoke damages their immune system or the cells that line the mouth and throat.

HPV is very common and rarely causes symptoms. And even though HPV infection is linked to most cases of oropharyngeal cancer, most people with HPV infections of the mouth and throat do not go on to develop this cancer.

Vaccines that reduce the risk of infection with certain types of HPV are available. These vaccines were originally meant to lower the risk of cervical cancer[2], but they have been shown to lower the risk of other cancers linked to HPV, such as cancers of the penis, anus, vulva, vagina, and mouth and throat.

Since these vaccines are most effective if given before someone is infected with HPV, they're recommended to be given when a person is young, before they're likely to become sexually active. But certain adults can also get the HPV vaccine.

See HPV[3] to learn more.

Limit exposure to ultraviolet (UV) light

Ultraviolet radiation[4] is an important and avoidable risk factor for cancer of the lips, as well as for skin cancer[5]. If possible, limit the time you spend outdoors during the middle of the day, when the sun's UV rays are strongest. If you are out in the sun, wear a wide-brimmed hat and use sunscreen and lip balm with a sun protection factor (SPF) of at least 30.

Maintain a healthy weight and eating pattern

Poor nutrition and excess body weight have been linked to oral cavity and oropharyngeal cancers. Following a healthy eating pattern with more plant-based foods, such as non-starchy vegetables and whole fruit may help lower your risk of these cancers (and many others).

The American Cancer Society recommends following a healthy eating pattern that includes plenty of fruits, vegetables, and whole grains, and that limits or avoids red and processed meats, sugary drinks, and highly processed foods. In general, eating a healthy diet is much better than adding vitamin supplements to an otherwise unhealthy diet. See the American Cancer Society Guidelines for Diet and Physical Activity for Cancer Prevention[6] for our full guidelines.

Get regular dental checkups

Areas of leukoplakia or erythroplakia[7] (pre-cancer growths) in the mouth sometimes turn into cancer. Doctors often remove these areas, especially if a biopsy shows they contain areas of dysplasia (abnormal growth) when looked at closely in the lab.

But removing areas of leukoplakia or erythroplakia doesn't always keep someone from getting oral cavity cancer. Studies have found that even when these areas are completely removed, people with certain types of erythroplakia and leukoplakia still have a higher chance of developing a cancer in some other area of their mouth. This may be because the whole lining of the mouth has probably been exposed to the same cancer-causing agents that led to these pre-cancers (like tobacco). This means that the entire area may already have early changes that can lead to cancer.

It's important for people who have had these areas removed to continue having check-ups to look for cancer and new areas of leukoplakia or erythroplakia.

If you wear dentures, make sure they fit properly. Avoiding sources of oral irritation (such as dentures that don't fit properly) may help lower your risk for oral cancer.

Hyperlinks

1. www.cancer.org/cancer/risk-prevention/tobacco.html
2. www.cancer.org/cancer/types/cervical-cancer.html
3. www.cancer.org/cancer/risk-prevention/hpv.html
4. www.cancer.org/cancer/risk-prevention/sun-and-uv/uv-radiation.html
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6. www.cancer.org/cancer/risk-prevention/diet-physical-activity/acs-guidelines-nutrition-physical-activity-cancer-prevention.html
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