



# Laryngeal and Hypopharyngeal Cancer

## What is cancer?

The body is made up of trillions of living cells. Normal body cells grow, divide, and die in an orderly fashion. During the early years of a person's life, normal cells divide faster to allow the person to grow. After the person becomes an adult, most cells divide only to replace worn-out or dying cells or to repair injuries.

Cancer begins when cells in a part of the body start to grow out of control. There are many kinds of cancer, but they all start because of out-of-control growth of abnormal cells.

Cancer cell growth is different from normal cell growth. Instead of dying, cancer cells continue to grow and form new, abnormal cells. Cancer cells can also invade (grow into) other tissues, something that normal cells cannot do. Growing out of control and invading other tissues are what makes a cell a cancer cell.

Cells become cancer cells because of damage to DNA. DNA is in every cell and directs all its actions. In a normal cell, when DNA gets damaged the cell either repairs the damage or the cell dies. In cancer cells, the damaged DNA is not repaired, but the cell doesn't die like it should. Instead, this cell goes on making new cells that the body does not need. These new cells will all have the same damaged DNA as the first cell does.

People can inherit damaged DNA, but most DNA damage is caused by mistakes that happen while the normal cell is reproducing or by something in our environment. Sometimes the cause of the DNA damage is something obvious, like cigarette smoking. But often no clear cause is found.

In most cases the cancer cells form a tumor. Some cancers, like leukemia, rarely form tumors. Instead, these cancer cells involve the blood and blood-forming organs and circulate through other tissues where they grow.

Cancer cells often travel to other parts of the body, where they begin to grow and form new tumors that replace normal tissue. This process is called metastasis. It happens when the cancer cells get into the bloodstream or lymph vessels of our body.

No matter where a cancer may spread, it is always named for the place where it started. For example, breast cancer that has spread to the liver is still called breast cancer, not liver cancer. Likewise, prostate cancer that has spread to the bone is metastatic prostate cancer, not bone cancer.

Different types of cancer can behave very differently. For example, lung cancer and breast cancer are very different diseases. They grow at different rates and respond to different treatments. That is why people with cancer need treatment that is aimed at their particular kind of cancer.

Not all tumors are cancerous. Tumors that aren't cancer are called benign. Benign tumors can cause problems – they can grow very large and press on healthy organs and tissues. But they cannot grow into (invade) other tissues. Because they can't invade, they also can't spread to other parts of the body (metastasize). These tumors are almost never life threatening.

## **What are laryngeal and hypopharyngeal cancers?**

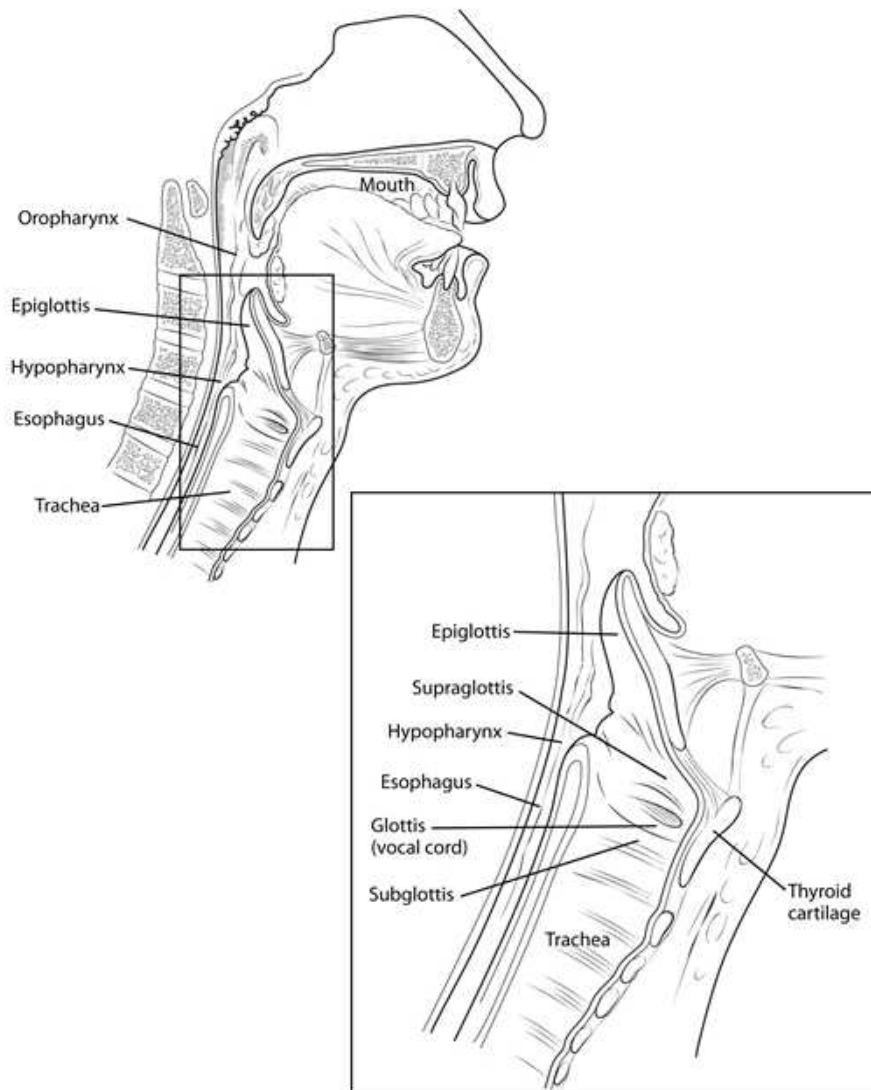
To understand these cancers, it helps to know a little about the larynx and hypopharynx.

### **What is the larynx?**

The *larynx*, often called the *voice box*, is one of the organs that helps us speak. It contains the vocal cords. It is located in the neck, at the opening of the trachea (windpipe). There, it helps protect the trachea from food and fluids. It is divided into 3 sections:

- The supraglottis (the area above the vocal cords); it contains the epiglottis, which closes off the larynx when you swallow to keep food from going into your lungs
- The glottis (the area containing the vocal cords)
- The subglottis (the area below the vocal cords)

Cancer that starts in the larynx (laryngeal cancer) is treated differently based on which section it starts in.



Your larynx and vocal cords have several functions:

- The larynx produces sound for speaking. The vocal cords move and come together to change the sound and pitch of your voice.
- The larynx protects the airway during swallowing. The epiglottis and vocal cords close tightly when you swallow to keep food and saliva from entering your lungs.
- The vocal cords open naturally when you breathe so that air can get in and out of your lungs.

## What is the hypopharynx?

The *hypopharynx* is the part of the throat (pharynx) that lies beside and behind the larynx. The hypopharynx is the entrance into the esophagus (the tube that connects the throat to the stomach). Food goes from the mouth and through the hypopharynx and esophagus, where it then passes into the stomach. The structure of the hypopharynx makes sure that food goes around the larynx and into the esophagus.

## Cancers of the larynx and hypopharynx

Cancers that start in the larynx are called *laryngeal cancers*; cancers of the hypopharynx are called *hypopharyngeal cancers*. Both types of cancers are discussed in the same document because these 2 separate structures are so close to each other.

### Squamous cell carcinomas

Almost all cancers in the larynx or hypopharynx develop from the thin, flat cells called *squamous cells*, which are in the epithelium, the inner layer lining these 2 structures. Cancer beginning in this layer of cells is called *squamous cell carcinoma* or squamous cell cancer.

Most squamous cell cancers of the larynx and hypopharynx begin as pre-cancerous conditions called *dysplasia*. When seen under a microscope, these cells look abnormal but not quite like cancer cells. Most of the time, dysplasia doesn't turn into actual cancer. It often goes away without any treatment, especially if the underlying cause (like smoking) is stopped. (See the section, "What are the risk factors for laryngeal and hypopharyngeal cancers?")

Some cases of dysplasia will progress into a condition called *carcinoma in situ* (CIS). In CIS, the cancer cells are only seen in the epithelium lining the larynx or hypopharynx. They have not grown into deeper layers or spread to other parts of the body. CIS is the earliest form of cancer. Most of these early cancers can be cured, but if CIS is not treated, it can develop into an invasive squamous cell cancer that will destroy the nearby tissues and can spread to other parts of the body.

### Other cancers

Other rare types of cancer can also start in the larynx or hypopharynx.

**Minor salivary gland cancers:** Some areas of the larynx and hypopharynx have tiny glands known as *minor salivary glands* beneath their lining layer. These glands produce mucus and saliva to lubricate and moisten the area. Cancer rarely develops from the cells of these glands, but when it does, these cancers can have the following names:

- Adenocarcinoma
- Adenoid cystic carcinoma

- Mucoepidermoid carcinoma

**Sarcomas:** The shape of the larynx and hypopharynx depends on a framework of connective tissues and cartilage. Cancers like *chondrosarcomas* or *synovial sarcomas* can develop from connective tissues of the larynx or hypopharynx, but this is extremely rare.

**Melanomas:** These cancers usually start in the skin, but in rare cases they can start on inner (mucosal) surfaces of the body, such as in the larynx or hypopharynx.

These rare cancers of the larynx or hypopharynx are not discussed further here. **The rest of this information refers only to squamous cell cancer.**

## What are the key statistics about laryngeal and hypopharyngeal cancers?

The American Cancer Society's most recent estimates for laryngeal cancer in the United States are for 2012:

- About 12,360 new cases of laryngeal cancer (9,840 in men and 2,520 in women)
- About 3,650 people (2,880 men and 770 women) will die from laryngeal cancer

For laryngeal cancer about 60% start in the glottis – the vocal cords themselves – while about 35% develop in the supraglottic region (above the vocal cords). The rest occur in either the subglottis or overlap more than one area so that it is hard to tell where they started.

The American Cancer Society estimates that 13,510 new cases of cancer of the pharynx will occur in 2012 (10,790 in men and 2,720 in women). Only some of these cases will start in the hypopharynx, with about 2,400 cases of hypopharyngeal cancer estimated to occur in 2012 (about 1,920 in men and 480 in women).

The rate of new cases of laryngeal cancer is falling about 2% to 3% a year, mainly because fewer people are smoking.

Survival statistics for these cancers are discussed in the section, "Survival rates for laryngeal and hypopharyngeal cancers by stage."

## What are the risk factors for laryngeal and hypopharyngeal cancers?

A risk factor is anything that affects your chance of getting a disease like cancer. Different cancers have different risk factors. For example, smoking is a risk factor for many cancers including cancer of the lung. Exposing skin to strong sunlight is a risk factor for skin cancer.

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

Laryngeal and hypopharyngeal cancers are often grouped together with other cancers of the mouth and throat into a group known as *head and neck cancers*. These cancers often have many of the same risk factors, some of which are included below.

## Tobacco and heavy alcohol use

Tobacco use is the most important risk factor for head and neck cancers (including cancers of the larynx and hypopharynx). The risk of developing cancer in these areas is much higher in smokers than in nonsmokers. Most people with these cancers have a history of smoking or other tobacco exposure. The more you smoke, the greater the risk. Smoke from cigarettes, pipes, and cigars all increase the chance of getting these cancers.

Some studies have also found that long-term exposure to secondhand smoke may increase the risk of these cancers, but more research is needed to confirm this finding.

Drinking alcohol also increases the risk of these cancers. Heavy drinkers have a risk that is several times that of nondrinkers.

People who use both tobacco and alcohol have the highest risk of all. Combining these 2 habits doesn't just add both risks together, it actually multiplies them. People who smoke and drink are many times more likely to get head and neck cancer than are people with neither habit.

## Poor nutrition

Poor nutrition may increase the risk of getting head and neck cancer. Vitamin deficiencies often occur in those who abuse alcohol and may be partly responsible for alcohol's role in increased risk of these cancers.

## Human papilloma virus infection

The human papilloma virus (HPV) is a group of over 100 related viruses. They are called papilloma viruses because some of them cause a type of growth called a papilloma, which is more commonly known as a wart. Some types of HPV can cause cancers of the cervix, vagina, anus, vulva, or penis. HPV also seems to be a factor in some cases of throat cancer, such as cancer of the tonsils and cancers of the hypopharynx. It does not seem to be a factor in laryngeal cancer.

## Weakened immune system

Laryngeal and hypopharyngeal cancers are more common in people who have a weak immune system. A weak immune system can be caused by certain diseases present at birth, the acquired immunodeficiency syndrome (AIDS), and certain medicines (such as those given after organ transplants).

## Genetic syndromes

People with certain syndromes caused by inherited defects (mutations) in certain genes have a very high risk of throat cancer, including cancer of the hypopharynx.

**Fanconi anemia** is a condition that can be caused by inherited defects in several genes. People with this syndrome often have blood problems at an early age, which may lead to leukemia or aplastic anemia. They also have a very high risk of cancer of the mouth and throat.

**Dyskeratosis congenita** is another genetic syndrome that can cause aplastic anemia, skin rashes, and abnormal fingernails and toenails. People with this syndrome have a very high risk of developing cancer of the mouth and throat at an early age.

More information about Fanconi anemia and dyskeratosis congenita can be found in our document, *Aplastic Anemia*.

## Workplace exposures

Long and intense exposures to wood dust, paint fumes, and certain chemicals used in the metalworking, petroleum, plastics, and textile industries can also increase the risk of laryngeal and hypopharyngeal cancers.

Asbestos is a mineral fiber that was often used as an insulating material in many products in the past. Exposure to asbestos is an important risk factor for lung cancer and mesothelioma (cancer that starts in the lining of the chest or abdomen). Some studies have also linked asbestos exposure to laryngeal cancer.

## Gender

Cancers of the larynx and hypopharynx are about 4 times more common in men than women. This is likely because the main risk factors — smoking and heavy alcohol use — are more common in men. In recent years, however, as these habits have become more common among women, their risks for these cancers have increased as well.

## Age

Cancers of the larynx and hypopharynx usually take many years to develop, so they are not common in young people. Over half of patients with these cancers are older than 65 when the cancers are first found.

## Race

Cancers of the larynx and hypopharynx are more common among African Americans and whites than among Asians and Latinos.

## Gastroesophageal reflux disease

When acid from the stomach backs up into the esophagus it is called *gastroesophageal reflux disease* (GERD). GERD can cause heartburn and increase the chance of cancer of the esophagus. It is not clear if it increases the risk of laryngeal and hypopharyngeal cancers. This is now being studied.

## Do we know what causes laryngeal and hypopharyngeal cancers?

We don't know what causes each case of laryngeal or hypopharyngeal cancer. But we do know many of the risk factors for these cancers (see "What are the risk factors for laryngeal and hypopharyngeal cancers?") and how some of them cause cells to become cancerous.

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 larynx and hypopharynx.

DNA is the chemical in each of our cells that makes up our *genes* — the instructions for how our cells function. We usually look like our parents because they are the source of our DNA. However, DNA affects more than how we look. Some genes have instructions for controlling when cells grow and divide. Genes that promote cell division are called *oncogenes*. Genes that slow down cell division or cause cells to die at the right time are called *tumor suppressor genes*. Cancers can be caused by DNA changes that turn on oncogenes or turn off tumor suppressor genes.

Some people inherit DNA mutations (changes) from their parents that greatly increase their risk for developing certain cancers. But inherited oncogene or tumor suppressor gene mutations are not believed to cause very many cancers of the larynx or hypopharynx.

Gene changes related to these cancers usually start during life rather than before birth like an inherited mutation does. These *acquired* mutations often result from exposure to cancer-causing chemicals, like those found in tobacco smoke. Acquired changes in genes, such as the *p53* and *p16* tumor suppressor genes, seem to be important in the development of larynx and hypopharynx cancers, although not all cancers have these changes. Several different gene changes are probably needed for cancer to develop, and not all of these changes are understood at this time.

Inherited mutations of oncogenes or tumor suppressor genes rarely cause these cancers, but some people seem to inherit a reduced ability to detoxify (break down) certain types of cancer-causing chemicals. Others may inherit an increased tendency to activate cancer-causing chemicals, making them even more dangerous. These people are more sensitive to the cancer-causing effects of tobacco smoke, alcohol, and certain industrial chemicals. Researchers are developing tests that may help identify such people, but these tests are

not yet reliable enough for routine use. Therefore, doctors recommend that all people avoid tobacco smoke and hazardous industrial chemicals.

Some forms of human papilloma virus (HPV) are emerging as important causes of some throat cancers (including cancers of the hypopharynx). Patients who develop HPV-associated hypopharyngeal cancers are less likely to have exposure to tobacco and alcohol. The outlook of HPV-associated head and neck cancers appears to be better than for HPV-negative head and neck cancers.

## **Can laryngeal and hypopharyngeal cancers be prevented?**

Not all cases of laryngeal and hypopharyngeal cancer can be prevented, but the risk of developing these cancers can be greatly reduced by avoiding certain risk factors. The most effective way is to avoid known risk factors such as smoking and alcohol use.

Tobacco use is the most important cause of cancers in these areas. Avoiding exposure to tobacco (by not smoking and avoiding secondhand smoke) lowers the risk of these cancers. Heavy alcohol use greatly increases the cancer-causing effect of tobacco smoke, so it is especially important to avoid the combination of drinking and smoking.

Plenty of workplace ventilation and the use of industrial respirators when working with cancer-causing chemicals are important preventive measures.

Poor nutrition and vitamin deficiencies have been linked to laryngeal and hypopharyngeal cancers. Eating a balanced, healthy diet may help lower your risk of these cancers (and many others).

The American Cancer Society recommends eating a healthy diet, with an emphasis on plant foods. This includes eating at least 2½ cups of vegetables and fruits every day. Choosing whole-grain breads, pastas, and cereals instead of refined grains, and eating fish, poultry, or beans instead of processed meat and red meat may also help lower your risk of cancer. In general, eating a healthy diet is much better than adding vitamin supplements to an otherwise unhealthy diet.

Doctors are now studying whether certain drugs or vitamins might help prevent these cancers, especially in people who are at high risk. So far, none have been successful enough to be recommended.

## **Can laryngeal and hypopharyngeal cancers be found early?**

Screening is testing for diseases like cancer in people without any symptoms. Screening tests may find some types of cancer early, when treatment is most likely to be effective.

But for now there is no simple screening test for laryngeal and hypopharyngeal cancers. These cancers are often hard to find and diagnose without complex tests. Because the cancers are not common, and the tests require specialized doctors, neither the American Cancer Society nor any other group recommends routine screening for these cancers.

Still, many laryngeal and some hypopharyngeal cancers can be found early. They usually cause symptoms, such as voice changes, which are described in the section, "How are laryngeal and hypopharyngeal cancers diagnosed?" Talk to your doctor if you have any of these symptoms. Many of the symptoms of laryngeal and hypopharyngeal cancers are more often caused by less serious, benign (non-cancerous) problems, or even other cancers. Still, it is important to see a doctor to find out what is causing your symptoms. The sooner the cause is found, the sooner you can start treatment and the more effective your treatment will be.

## How are laryngeal and hypopharyngeal cancers diagnosed?

Laryngeal and hypopharyngeal cancers are usually found because of signs or symptoms a person is having. If cancer is suspected, tests will be needed to confirm the diagnosis. Diagnosis in people without symptoms is rare and usually accidental (because of tests done to check other medical problems).

### Signs and symptoms

In most cases, laryngeal and hypopharyngeal cancers are found because of the symptoms they cause. Diagnosis in people without symptoms is rare and usually accidental (because of tests done to check other medical problems).

### Hoarseness or voice changes

Laryngeal cancers that form on the vocal cords (glottis) often cause hoarseness or a change in the voice. This can lead to them being found at a very early stage. People who have voice changes (like hoarseness) that do not improve within 2 weeks should see their health care provider right away. For a complete evaluation, they may be referred to an ear, nose, and throat (ENT) specialist. These doctors are also known as *otolaryngologists* or as *head and neck surgeons*.

For cancers that don't start on the vocal cords, hoarseness occurs only after these cancers reach a later stage or have spread to the vocal cords. These cancers are sometimes not found until they have spread to the lymph nodes and the patient notices a growing mass in the neck.

## **Other symptoms**

Cancers that start in the area of the larynx above the vocal cords (supraglottis), the area below the vocal cords (subglottis), or the hypopharynx do not usually cause hoarseness or other such clear symptoms, and are therefore more often found at later stages.

Symptoms of these cancers may include:

- A sore throat that does not go away
- Constant coughing
- Pain when swallowing
- Trouble swallowing
- Ear pain
- Trouble breathing
- Weight loss
- A lump or mass in the neck (due to spread of the cancer to nearby lymph nodes)

Having one or more of these symptoms does not mean you have laryngeal or hypopharyngeal cancer. In fact, many of these symptoms are more likely to be caused by other conditions. Still, if you have any of these symptoms, it is very important to have them checked by a doctor so that the cause can be found and treated, if needed.

## **Exams and tests for laryngeal or hypopharyngeal cancer**

If you have signs or symptoms that suggest you might have a cancer of the larynx or hypopharynx, your doctor will recommend one or more of the following exams or tests.

### **Medical history and physical exam**

The first step in any medical evaluation is for your doctor to gather information about your symptoms, risk factors, family history, and other medical conditions. A thorough physical exam can help uncover any signs of possible cancer or other diseases. In particular, your doctor will pay close attention to your head and neck, looking for abnormal areas in your mouth or throat, as well as enlarged lymph nodes in your neck.

### **Consultation with a specialist**

If your doctor suspects a cancer of the larynx or hypopharynx, you will be referred to an otolaryngologist (a doctor who specializes in diseases of the ear, nose, and throat), who will do a more thorough exam of the head and neck area. The specialist will also examine the larynx and hypopharynx (known as *laryngoscopy*). It can be done in 2 ways:

**Direct (flexible) laryngoscopy:** For this exam, the doctor inserts a fiber-optic laryngoscope — a thin, flexible, lighted tube — through the mouth or nose to look at the larynx and nearby areas.

**Indirect laryngoscopy:** In this exam, the doctor uses special small mirrors to view the larynx and nearby areas.

Both types of exams can be done in the doctor's office. For either type of exam, the doctor may spray the back of your throat with numbing medicine to help make the exam easier.

Patients with laryngeal or hypopharyngeal cancer also have a higher risk for other cancers in the head and neck region, so the nasopharynx (part of the throat behind the nose), mouth, tongue, and the neck are carefully looked at and felt for any signs of cancer.

## **Panendoscopy**

Panendoscopy is a procedure that combines laryngoscopy, esophagoscopy, and (at times) bronchoscopy. This lets the doctor thoroughly examine the entire area around the larynx and hypopharynx, including the esophagus and trachea (windpipe).

This exam is usually done in an operating room while you are under general anesthesia (asleep) so that the doctor can thoroughly examine the throat, voice box, and nearby areas. The doctor uses a rigid laryngoscope to look for tumors in the larynx and hypopharynx. Other parts of the mouth, nose, and throat are examined as well. If a tumor is found that is large or seems likely to spread, the doctor may also need to use an esophagoscope to look into the esophagus or a bronchoscope to look into the trachea (windpipe).

Your doctor will look at these areas through the scope(s) to find any tumors, see how large they are, and see how far they may have spread to surrounding areas. A small piece of tissue from any tumors or other abnormal areas may be removed (biopsied) to be looked at under a microscope to see if they contain cancer. Biopsies can be done with special instruments operated through the scopes.

## **Biopsies to diagnose laryngeal and hypopharyngeal cancers**

In a biopsy, the doctor removes a sample of tissue to be looked at under a microscope. It is the only way to confirm the diagnosis of laryngeal or hypopharyngeal cancer.

### **Endoscopic biopsy**

The larynx and hypopharynx are deep inside the neck, so removing samples for biopsy can be complex. Because of this, these biopsies are done in the operating room while you are under general anesthesia (asleep), rather than in a doctor's office. The surgeon uses special instruments through a rigid laryngoscope (or other type of endoscope) to remove small tissue samples.

## **Fine needle aspiration (FNA) biopsy**

For an FNA biopsy, a thin, hollow needle is placed through the skin into a mass (or tumor) to obtain cells for a biopsy. The cells are then looked at under a microscope. FNA is not used to biopsy samples in the larynx or hypopharynx, but it may be done to find the cause of an enlarged lymph node in the neck.

If the FNA finds cancer, the pathologist (doctor examining the samples with a microscope) can often tell what type of cancer it is. If the type of cancer seen is consistent with cancers that begin in the larynx or hypopharynx, an endoscopic exam and biopsy of these areas will be needed as well.

If the FNA does not find cancer, it only means that cancer was not found in that lymph node. Cancer could still be present in other places. If you are having symptoms that may suggest a laryngeal or hypopharyngeal cancer, you may still need other procedures to find the cause of the symptoms.

FNA biopsies may also be useful in some patients already known to have laryngeal or hypopharyngeal cancer. If the patient has a lump in the neck, an FNA can help determine if the mass is due to spread of the cancer. FNA may also be used in patients whose laryngeal or hypopharyngeal cancer has been treated by surgery and/or radiation therapy, to help find out if a new neck mass in the treated area is scar tissue or if it is a return (recurrence) of the cancer.

## **Imaging tests**

Imaging tests use x-rays, magnetic fields, sound waves, or radioactive substances to create pictures of the inside of your body. Imaging tests are not used to diagnose laryngeal or hypopharyngeal cancers, but they may be done for a number of reasons both before and after a cancer diagnosis, including:

- To help look for a tumor if one is suspected
- To learn how far cancer may have spread
- To help determine if treatment has been effective
- To look for possible signs of cancer recurrence after treatment

## **Computed tomography (CT) scan**

The CT scan (also known as a CAT scan) uses x-rays to produce detailed cross-sectional images of your body. Instead of taking one picture like a standard x-ray, a CT scanner takes many pictures of the part of your body being studied as it rotates around you. A computer then combines these pictures into an image of a slice of your body. Unlike a regular x-ray, a CT scan creates detailed images of the soft tissues and organs in the body.

This test can help your doctor determine the size of the tumor, if it is growing into nearby tissues, and if it has spread to lymph nodes in the neck. It may also be done to look for spread of cancer to the lungs.

You may be asked to drink 1 to 2 pints of a liquid called "oral contrast" before any pictures are taken. This helps outline the digestive tract so that certain areas are not mistaken for tumors. You may also receive an IV (intravenous) line through which a different kind of contrast dye (IV contrast) is injected. This helps better outline other structures in your body. Some people are allergic to the dye and get hives, a flushed feeling, or, rarely, more serious reactions like trouble breathing and low blood pressure. Be sure to tell your doctor if you have any allergies or have ever had a reaction to any contrast material used for x-rays.

CT scans take longer than regular x-rays. You will need to lie still on a table while they are being done. During the test, the table slides in and out of the scanner, a ring-shaped machine that completely surrounds the table. You might feel a bit confined by the ring you have to lie in while the pictures are being taken. *Spiral CT* (also known as helical CT) is now used in many medical centers. This type of CT scan uses a faster machine that reduces the dose of radiation and yields more detailed pictures.

## **Magnetic resonance imaging (MRI) scan**

MRI scans use radio waves and strong magnets instead of x-rays. The energy from the radio waves is absorbed and then released in a pattern formed by the type of tissue and by certain diseases. A computer translates the pattern into a very detailed image of parts of your body. A contrast material may be injected just as with CT scans, but it is used less often.

Because it provides a very detailed picture, an MRI scan may be done to look for spread of the cancer in the neck. These scans can also be very useful in looking at other areas of the body as well.

MRI scans are a little more uncomfortable than CT scans. First, they take longer – often up to an hour. Second, you have to lie inside a narrow tube, which is confining and can upset people with claustrophobia (a fear of enclosed spaces). Newer, more open MRI machines can sometimes help with this if needed, although the images may not be as sharp in some cases. MRI machines make buzzing and clicking noises that you may find disturbing. Some centers provide earplugs to help block this noise out.

## **Barium swallow**

In this test, the patient drinks a chalky liquid called *barium* to coat the walls of the throat and esophagus. A series of x-rays of the throat and esophagus is taken as the patient swallows, which the barium outlines clearly. This test can show abnormalities in the throat as a person swallows. This is often the first test done if someone is having a problem with swallowing.

## **Chest x-ray**

A chest x-ray may be done to see if laryngeal or hypopharyngeal cancer has spread to the lungs. If any suspicious spots are noted on the chest x-ray, a CT scan of the chest may be needed to get a more detailed picture.

## **Positron emission tomography (PET) scan**

For a PET scan, a form of radioactive sugar (known as fluorodeoxyglucose or FDG) is injected into the blood. The amount of radioactivity used is very low. Cancer cells in the body are growing rapidly, so they absorb large amounts of the radioactive sugar. After about an hour, you will be moved onto a table in the PET scanner. You lie on the table for about 30 minutes while a special camera creates a picture of areas of radioactivity in the body. The picture is not finely detailed like a CT or MRI scan, but it provides helpful information about your whole body.

A PET scan may be used to look for possible areas of cancer spread, especially if there is a good chance that the cancer is more advanced. This test also be used to help tell if a suspicious area seen on another imaging test is cancer or not.

Some newer machines are able to perform both a PET and CT scan at the same time (PET/CT scan). This lets the doctor compare areas of higher radioactivity on the PET with the more detailed appearance of that area on the CT.

For more information on these tests, see our document, *Imaging (Radiology) Tests*.

## **Other tests**

Other types of tests may be done as part of a workup if a patient has been diagnosed with laryngeal or hypopharyngeal cancer. These tests are not used to diagnose the cancer, but they may be done to see if a person is healthy enough for other treatments, such as surgery or chemotherapy.

Blood tests do not help diagnose laryngeal or hypopharyngeal cancer. Still, blood may be drawn to check liver and kidney function, as well as to help evaluate your overall medical condition before getting treatment. Blood tests are also needed if you are getting chemotherapy because chemo can affect the levels of blood cells in the body.

If surgery is planned, you might also have an electrocardiogram (EKG) to make sure your heart is functioning well. Some people having surgery also may need tests of their lung function. These are known as pulmonary function tests (PFTs).

# **How are laryngeal and hypopharyngeal cancers staged?**

The stage (extent of spread) of laryngeal or hypopharyngeal cancer is one of the most important factors in selecting treatment options and estimating the course of a patient's

illness and their outlook for survival (prognosis). Laryngeal and hypopharyngeal cancers are staged based on the results of exams, imaging tests, endoscopies, and biopsies, which are described in "How are laryngeal and hypopharyngeal cancers diagnosed?"

If you have laryngeal or hypopharyngeal cancer, ask your cancer care team to explain the stage of your cancer in a way that you understand. Knowing all you can about staging lets you take a more active role in making informed decisions about your treatment.

## The TNM staging system

A staging system is a way for members of the cancer care team to summarize the extent of a cancer's spread. The most common system used to describe the stages of cancers is the American Joint Committee on Cancer (AJCC) TNM system. For laryngeal and hypopharyngeal cancers, the TNM system is based on 3 key pieces of information:

- **T** stands for **tumor** (its size and how far it has spread within the larynx or hypopharynx and to nearby organs).
- **N** stands for spread to nearby lymph **nodes** in the neck. (Lymph nodes are bean-sized collections of immune system cells to which cancers often first spread.)
- **M** is for **metastasis** (spread to distant organs). These cancers most commonly spread to the lungs, although they may also spread to the bones, liver, or other organs.

## T groups for laryngeal and hypopharyngeal cancers

The T group of laryngeal and hypopharyngeal cancers describes how much the cancer has spread within the larynx or hypopharynx and to any surrounding structures. This is based on the results of exams such as laryngoscopy and on any imaging tests of the area, such as CT or MRI scans. Higher T group numbers indicate more spread within the larynx or hypopharynx and to other nearby areas in the neck.

The T group of laryngeal cancer also depends upon the movement of the vocal cords. The doctor will watch the vocal cords with an endoscope or special mirrors while the patient makes certain sounds. If the vocal cords move normally, the cancer probably has not affected deeper tissues. Vocal cord fixation (lack of movement) suggests involvement by cancer.

The features used to assign the T group of laryngeal cancer vary based on the area of the larynx involved (supraglottis, glottis, or subglottis). The T groups for hypopharyngeal cancer differ from those for cancer of the larynx.

## T groups common to all laryngeal and hypopharyngeal cancers

**TX:** Not enough information available to stage the tumor

**T0:** No tumor can be found

**Tis:** Carcinoma in situ. The cancer cells are only growing in the innermost layer (the epithelium) of the larynx or hypopharynx, with no cancer growing into the underlying connective tissue. (Very few hypopharyngeal and larynx cancers are found at this early stage.)

## **T groups for supraglottic cancer**

For cancer of the supraglottis (the area above the vocal cords), the T group is based on how many different parts (or sites) of the larynx are involved and how far outside the larynx the cancer has spread. The 5 subsites of the supraglottic part of the larynx are:

- The false vocal cords (or ventricular bands)
- Arytenoids
- Suprahyoid epiglottis
- Infrahyoid epiglottis
- Aryepiglottic folds

Whether or not the vocal cords move normally is also considered. When the vocal cords do not move normally it often means that the cancer is growing into them and is therefore more advanced.

**T1:** The vocal cords move normally and the tumor is only growing in 1 subsite of the supraglottis.

**T2:** The tumor is growing into at least 2 subsites of the supraglottis (or glottis). The vocal cords still move normally.

**T3:** One or both of the following applies:

- The tumor is growing only in the larynx and has caused the vocal cord to stop moving.
- The tumor is growing into nearby areas such as the postcricoid area, paraglottic space, pre-epiglottic (in front of the epiglottis) tissues, or the inner part of the thyroid cartilage (firm tissue that separates the thyroid gland from the front of the larynx).

**T4a:** The tumor is growing through thyroid cartilage and/or is growing into tissues beyond the larynx (such as the thyroid gland, trachea, esophagus, tongue muscles, or neck muscles). This is known as *moderately advanced local disease*.

**T4b:** The tumor is growing into the tissue in front of the spine in the neck (the prevertebral space), is growing around a carotid artery, or is growing down into the front of the chest cavity. This is also known as *very advanced local disease*.

## **T groups for glottic cancer**

**T1:** The tumor is growing only in the vocal cord(s). The vocal cords move normally.

**T2:** One or both of the following applies:

- The tumor is growing into the supraglottis and/or subglottis.
- The vocal cords do not move normally.

**T3:** One or more of the following applies:

- The tumor is growing only in the larynx and the vocal cord doesn't move.
- The tumor is growing into the paraglottic space.
- The tumor has started growing into the thyroid cartilage (firm tissue that separates the thyroid gland from the front of the larynx).

**T4a:** The tumor has grown through the thyroid cartilage and/or is growing into tissues beyond the larynx (such as the thyroid gland, trachea, esophagus, tongue muscles, or neck muscles). This is known as *moderately advanced local disease*.

**T4b:** The tumor is growing into the tissue in front of the spine in the neck (the prevertebral space), surrounds a carotid artery, or is growing down into the front of the chest cavity. This is also known as *very advanced local disease*.

## **T groups for subglottic cancer**

**T1:** The tumor is only growing in the subglottis.

**T2:** The tumor has grown from the subglottis to the vocal cords, with normal or reduced vocal cord movement.

**T3:** The tumor is growing only in the larynx and the vocal cord doesn't move.

**T4a:** The tumor is growing through the cricoid or thyroid cartilage and/or is growing into tissues beyond the larynx (such as the thyroid gland, trachea, esophagus, tongue muscles, or neck muscles). This is known as *moderately advanced local disease*.

**T4b:** The tumor is growing into the tissue in front of the spine in the neck (the prevertebral space), surrounds a carotid artery, or is growing down into the front of the chest cavity. This is also known as *very advanced local disease*.

## **T groups for hypopharyngeal cancer**

Spread of cancer within the hypopharynx is described based on the size of the tumor and how many areas (subsites) of the hypopharynx are involved by the cancer. The 3 subsites of the hypopharynx are the:

- Piriform sinuses
- Lateral (side) and posterior (back) hypopharyngeal walls
- Pharyngo-esophageal junction (where the throat and esophagus meet)

**T1:** The tumor is growing only in 1 subsite of the hypopharynx and it is 2 centimeters (cm) (about 3/4 of an inch) across or smaller.

**T2:** One or more of the following applies:

- The tumor is growing in 2 or more subsites of the hypopharynx.
- The tumor is growing in 1 subsite plus an area nearby.
- The tumor is more than 2 cm but not more than 4 cm (about 1 1/2 inches) across, with normal movement of the vocal cords.

**T3:** One or more of the following applies:

- The tumor is larger than 4 cm across.
- The tumor is affecting the movement of vocal cords.
- The tumor has grown into the esophagus.

**T4a:** The tumor is growing into the cricoid or thyroid cartilage, hyoid bone, thyroid gland, or the strap muscles in front of the larynx. This is known as *moderately advanced local disease*.

**T4b:** The tumor is growing into the space in front of the spine in the neck, is growing around a carotid artery, or is growing down into the front of the chest cavity. This is also known as *very advanced local disease*.

## **N groups for laryngeal and hypopharyngeal cancers**

The N groups are based on spread of the cancer to nearby (regional) lymph nodes and on the size of the nodes. These groups are the same for all laryngeal and hypopharyngeal cancers:

**NX:** The lymph nodes cannot be assessed (information not available).

**N0:** There is no evidence of spread to the lymph nodes.

**N1:** The cancer has spread to a single lymph node on the same side of the neck as the tumor. The lymph node is not larger than 3 cm (about 1¼ inch) across.

**N2:** Separated into 3 sub-groups:

- **N2a:** The cancer has spread to a single lymph node on the same side of the neck as the tumor. The lymph node is larger than 3 cm but not larger than 6 cm across.
- **N2b:** The cancer has spread to 2 or more lymph nodes on the same side of the neck as the tumor. None of these lymph nodes is larger than 6 cm across.
- **N2c:** The cancer has spread to lymph nodes on the side of the neck opposite the tumor or on both sides of neck. None of these lymph nodes is larger than 6 cm across.

**N3:** The cancer has spread to at least 1 lymph node that is larger than 6 cm across.

## M groups for laryngeal and hypopharyngeal cancers

The M groups for all head and neck cancers, including laryngeal and hypopharyngeal cancers, are the same:

**M0:** The cancer has not spread to distant sites.

**M1:** The cancer has spread to distant sites.

## Stage grouping

Once the T, N, and M groups have been assigned, this information is combined to assign an overall stage for the cancer. This process is called *stage grouping*. Stage grouping rules are the same for all cancers of the hypopharynx and the supraglottic, glottic, and subglottic areas of the larynx.

**Stage 0:** Tis, N0, M0

**Stage I:** T1, N0, M0

**Stage II:** T2, N0, M0

**Stage III:** T3, N0, M0, **OR** T1 to T3, N1, M0

**Stage IVA:** T4a, N0 or N1, M0, **OR** T1 to T4a, N2, M0

**Stage IVB:** T4b, Any N, M0, **OR** Any T, N3, M0

**Stage IVC:** Any T, Any N, M1

In general, patients with lower stage cancers tend to have a better outlook for a cure or long-term survival.

## Survival rates for laryngeal and hypopharyngeal cancer by stage

Survival rates are often used by doctors as a standard way of discussing a person's prognosis (outlook). Some patients with cancer may want to know the survival statistics for people in similar situations, while others may not find the numbers helpful, or may even not want to know them. . If you do not want to know the survival statistics for laryngeal and hypopharyngeal sinus cancers, do not read the next few paragraphs.

The 5-year survival rate refers to the percentage of patients who live *at least* 5 years after their cancer is diagnosed. Of course, many of these people live much longer than 5 years.

Five-year *relative* survival rates, such as the numbers below, assume that some people will die of other causes and compare the observed survival with that expected for people without the cancer. This is a more accurate way to describe the prognosis for patients with a particular type and stage of cancer.

To get 5-year survival rates, doctors have to look at people who were treated at least 5 years ago. Improvements in treatment since then may result in a more favorable outlook for people now being diagnosed with these cancers.

These numbers are from the National Cancer Data Base, based on patients diagnosed in 1998-1999, and published in the AJCC Cancer Staging Manual, Seventh Edition (see the “References” section).

### **Supraglottis**

<b>Stage</b>	<b>5-year relative survival rate</b>
I	59%
II	59%
III	53%
IV	34%

### **Glottis**

<b>Stage</b>	<b>5-year relative survival rate</b>
I	90%
II	74%
III	56%
IV	44%

### **Subglottis**

(These numbers are less accurate because of the small number of patients.)

<b>Stage</b>	<b>5-year relative survival rate</b>
I	65%
II	56%
III	47%
IV	32%

## Hypopharynx

Stage	5-year relative survival rate
I	53%
II	39%
III	36%
IV	24%

Survival rates are often based on previous outcomes of large numbers of people who had the disease, but they cannot predict what will happen in any particular person's case. Many other factors may affect a person's outlook, such as their general health and how well the cancer responds to treatment. Your doctor can tell you how the numbers above may apply to you, as he or she is familiar with the aspects of your particular situation. If you have any questions about the stage of your cancer or how it affects your treatment, do not hesitate to ask your doctor.

## How are laryngeal and hypopharyngeal cancers treated?

*This information represents the views of the doctors and nurses serving on the American Cancer Society's Cancer Information Database Editorial Board. These views are based on their interpretation of studies published in medical journals, as well as their own professional experience.*

*The treatment information in this document is not official policy of the Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor.*

*Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask him or her questions about your treatment options.*

### General treatment information

After your cancer is diagnosed and staged, your cancer care team will discuss your treatment options with you. Choosing a treatment plan is an important decision, so it is important to take time and think about all of the choices.

In creating your treatment plan, the most important factors to consider are the site of the cancer and the stage (extent) of the cancer. Your cancer care team will also take into account your general state of health and your personal preferences.

Treatment for laryngeal or hypopharyngeal cancer may include:

- Surgery
- Radiation therapy

- Chemotherapy (including targeted therapy drugs)

Depending on the stage of the cancer and your general medical condition, different treatment options may be used alone or in combination. Based on these options, you may have different types of doctors on your treatment team. These doctors may include:

- An otolaryngologist (also known as an ear, nose, and throat, or ENT doctor): a surgeon who treats certain diseases of the head and neck.
- A radiation oncologist: a doctor who treats cancer with radiation therapy.
- A medical oncologist: a doctor who treats cancer with medicines such as chemotherapy.

Many other specialists may be involved in your care as well, including nurse practitioners, nurses, nutrition specialists, social workers, and other health professionals.

It is important to discuss all of your treatment options, including their goals and possible side effects, with your doctors to help make the decision that best fits your needs. If time permits, it is often a good idea to seek a second opinion. A second opinion can provide you with more information and help you feel confident about your chosen treatment plan.

A major consideration in all treatments is to try to save your larynx and voice whenever possible. People who lose their voice can suffer from social isolation and depression. Most experts don't recommend surgery that will totally remove the larynx unless there are no other options.

If the cancer is too advanced to be cured, the goal may be to remove or destroy as much of the cancer as reasonable to keep the tumor from growing, spreading, or returning for as long as possible.

Some of the treatments above can also be used as palliative treatment if all the cancer cannot be removed. Palliative treatment is meant to relieve symptoms, such as pain or trouble swallowing, but it is not expected to cure the cancer.

The next few sections describe the different types of treatment for laryngeal and hypopharyngeal cancers. This is followed by a discussion of the most common treatment options based on the stage of the cancer.

## Surgery for laryngeal and hypopharyngeal cancers

Surgery is commonly used to treat patients with laryngeal and hypopharyngeal cancers. Depending on the stage of the cancer and its location, different operations may be used to remove the cancer and some of the surrounding laryngeal or hypopharyngeal tissue.

After surgery to remove the cancer, reconstructive surgery may be used to help restore the appearance and function of the affected areas.

## Vocal cord stripping

This technique uses a long surgical instrument to strip away the superficial layers of tissue on the vocal cords. This can be done to biopsy and treat some stage 0 cancers (carcinoma in situ) of the vocal cords. Most people can speak normally again after recovering from this operation.

## Laser surgery

Lasers can be used to treat some stage 0 (carcinoma in situ) and T1 cancers. An endoscope is passed down the throat to locate the tumor, which is then either vaporized or excised (cut out) using a high-intensity laser on the tip of the endoscope. A drawback of using vaporization is that by destroying the tissue being treated, it leaves nothing behind that can be sampled to look at under the microscope. If the laser is used to remove part of a vocal cord, it may result in hoarse speech.

## Cordectomy

For a cordectomy the surgeon removes all or part of the vocal cords. This can be used to treat very small or superficial glottic (vocal cord) cancers. The effect of this procedure on speech varies depending on how much of the vocal cords are removed. Removing part of a vocal cord may result in hoarse speech. Normal speech is no longer possible if both vocal cords are removed.

## Laryngectomy

Laryngectomy is the removal of part or all of the larynx (voice box).

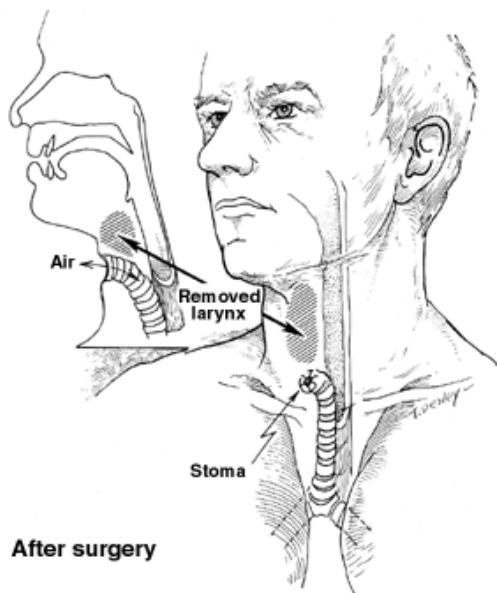
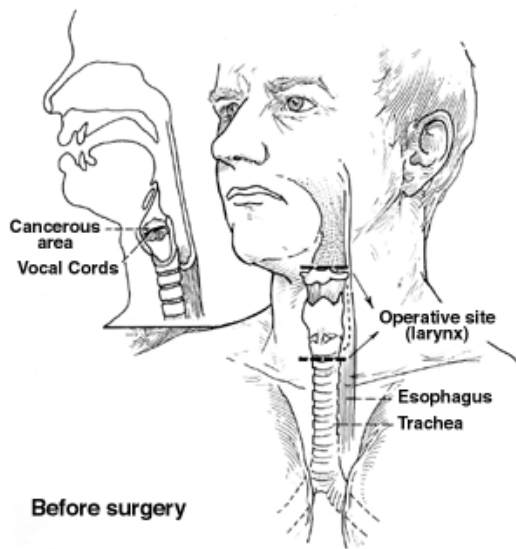
**Partial laryngectomy:** Smaller cancers of the larynx often can be treated by removing only part of the voice box. This is called partial laryngectomy. There are different types of partial laryngectomy procedures, but they all have the same goal: to remove the entire cancer while leaving behind as much of the natural larynx as possible.

In a supraglottic laryngectomy, only the portion of the larynx above the vocal cords is removed. This procedure can be used to treat some supraglottic cancers, and allows the patient to retain normal speech.

For small cancers of the vocal cords (glottis), the surgeon may be able to remove the cancer by taking out only one vocal cord and leaving the other behind. This allows for some speech to remain and is known as a hemilaryngectomy.

**Total laryngectomy:** In this procedure, the entire larynx (voice box) is removed. The windpipe is then brought up through the skin of the front of the neck as a stoma (or hole) that you breathe through (see the illustration below). This is known as a tracheostomy. Once the entire larynx is removed, normal speech is no longer possible, but people can learn other forms of speaking (see "What happens after treatment for laryngeal and hypopharyngeal cancers?"). The connection between the throat and the esophagus is

usually not affected, so after recovering from surgery, food and liquids can be swallowed just as they were before the operation.



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## **Total or partial pharyngectomy**

Surgery to remove all or part of the pharynx is called a pharyngectomy. This operation may be needed to treat cancers of the hypopharynx. Often, the larynx is removed along with the hypopharynx. After surgery, you may need a reconstructive procedure to rebuild this part of the throat and improve your ability to swallow.

## **Reconstructive procedures**

These operations may be done to help restore the structure or function of areas affected by more extensive surgeries to remove the cancer.

**Myocutaneous flaps:** Sometimes a muscle and area of skin may be rotated from an area close to your throat, such as the chest (pectoralis major flap), to reconstruct the throat.

**Free flaps:** With the advances of microvascular surgery (sewing together small blood vessels under a microscope), surgeons now have many more options to reconstruct the area of your throat. Tissues from other areas of your body such as a piece of intestine or a piece of arm muscle can be used to replace parts of your throat.

## **Lymph node removal**

Cancers of the larynx and hypopharynx may spread to the lymph nodes in the neck. If, based on the stage and location of the tumor, your doctor thinks that lymph node spread is likely, it may be necessary to remove lymph nodes (and other nearby tissues) from your neck. This operation, called a *neck dissection*, is done at the same time as the surgery to remove the main tumor.

There are several forms of neck dissections, ranging from the radical neck dissection to a less extensive selective neck dissection. They differ in the amount of tissue removed from the neck. The amount removed depends on the size and extent of cancer spread. In a full radical dissection, nerves and muscles responsible for some neck and shoulder movement are removed along with the lymph nodes. This may be needed in order to be sure that all of the lymph nodes likely to contain cancer are removed. Sometimes doctors will try to remove less normal tissue in order to keep the shoulder and neck functioning normally.

## **Tracheotomy/tracheostomy**

A tracheotomy is an incision (hole) made in the trachea (windpipe) to help a person breathe by letting air in and out of the lungs. It may be used in different circumstances.

As described above, a permanent tracheotomy is needed after a total laryngectomy. This procedure, in which the opening in the trachea is connected to a hole in the skin in the front of the neck, is known as a tracheostomy.

A temporary tracheotomy (using a small plastic tube) may be put in place after a partial laryngectomy or pharyngectomy to help protect the airway during recovery from surgery. It stays in place for a short time, and is then removed later when it is no longer needed.

If a laryngeal or hypopharyngeal cancer is blocking the windpipe and is too large to remove completely, an opening may be made to connect the lower part of the windpipe to a stoma (hole) in the front of your neck to bypass the tumor and allow you to breathe more comfortably. The new opening is called a tracheostomy.

## **Gastrostomy tube**

Cancers in the larynx and hypopharynx may prevent you from swallowing enough food to maintain good nutrition. This can make you weak and make it harder to complete treatment.

A gastrostomy tube (G tube) is a feeding tube that is placed through the skin and muscle of your abdomen directly into your stomach. Sometimes this tube is placed during an operation, but often it is placed endoscopically, with the patient sedated. When it is placed through endoscopy, it is called a percutaneous endoscopic gastrostomy, or PEG tube. Once in place, it can be used to deliver nutrition directly into the stomach.

Often, the gastrostomy tube is only needed for a short time to help you get adequate nutrition during radiation and/or chemotherapy. The feeding tube can be removed once your swallowing function improves after treatment.

## **Possible risks and side effects of surgery**

All surgeries carry some risks, including blood clots, infections, complications from anesthesia, and pneumonia. These risks are generally low but are higher with more complicated operations.

Laryngectomy and pharyngectomy typically lead to the loss of normal speech, while less extensive operations can also affect speech in some cases.

Some people will need a tracheostomy after surgery.

Surgeries that involve the throat or voice box can lead to a gradual narrowing (stenosis) of the throat or larynx (if it remains after surgery), which in some cases could affect breathing. If this happens, a tracheostomy may be needed.

Laryngectomy and pharyngectomy can also lead to the development of a fistula (an abnormal opening between 2 areas that are not normally connected). This may require surgery to correct.

Throat or larynx surgeries may also sometimes affect a person's ability to swallow. This can be severe enough to require a permanent feeding tube in some cases.

A very rare but serious complication of neck surgery is rupture of a carotid artery (the large artery on either side of the neck).

Rarely, these operations can lead to problems with the thyroid and/or parathyroid glands, which are in the front of the neck. Damage to the thyroid gland can lead to hypothyroidism, where the patient feels very tired and sluggish. Damage to the

parathyroid gland can lead to problems with low calcium levels, which can cause muscle spasms and irregular heart beat. These problems can be treated with medicines.

For more general information on surgery as a treatment for cancer, see our document, *Surgery*.

## Radiation therapy for laryngeal and hypopharyngeal cancers

Radiation therapy uses high-energy x-rays, gamma rays, or particles to kill cancer cells. It may be used in different situations for laryngeal and hypopharyngeal cancers.

- Radiation may be used as the main (primary) treatment of some laryngeal and hypopharyngeal cancers. If the cancer is small, it can often be destroyed by radiation without surgery. This treatment can help to preserve better voice quality.
- Radiation can be used to treat some patients whose general health is too poor for surgery.
- It may be used after a cancer is removed with surgery, to try to kill any small areas of cancer that may remain and lower the chance the cancer will come back. This is called *adjuvant treatment*.
- Radiation therapy can be used to ease symptoms of advanced laryngeal and hypopharyngeal cancer such as pain, bleeding, trouble swallowing, and problems caused by spread of cancer to the bones.

Often, chemotherapy is given along with the radiation. This combination, called *chemoradiation*, can be more effective than radiation alone, but it also has more side effects. (See the “Chemotherapy” section for more details.)

### Types of radiation therapy

There are 2 main types of radiation therapy.

#### External beam radiation therapy

In the most common type of radiation therapy to treat laryngeal and hypopharyngeal cancer, radiation from a source outside the body is focused on the cancer.

Before your treatments start, the radiation team will take careful measurements to determine the correct angles for aiming the radiation beams and the proper dose of radiation. Radiation therapy is much like getting an x-ray, but the radiation is stronger. The procedure itself is painless. Each treatment lasts only a few minutes, although the setup time— getting you into place for treatment — usually takes longer.

External beam radiation therapy for laryngeal and hypopharyngeal cancer is usually given in daily fractions (doses), 5 days per week, for about 7 weeks. Other schedules for radiation doses have been studied in clinical trials.

*Hyperfractionation* refers to giving the total radiation dose in a larger number of doses (2 smaller doses per day instead of 1 larger dose, for example). *Accelerated fractionation* means that the radiation treatment is completed faster (6 weeks instead of 7 weeks, for instance).

Hyperfractionation and accelerated fractionation schedules may reduce the risk of laryngeal and hypopharyngeal cancer coming back in or near the place it started (called local recurrence) and may help some patients live longer. The drawback is that these schedules also tend to have more severe side effects.

Several newer techniques help doctors focus the radiation more precisely, and may be helpful in some situations.

**Three-dimensional conformal radiation therapy (3D-CRT):** 3D-CRT uses the results of imaging tests such as MRI and special computers to precisely map the location of the tumor. Several radiation beams are then shaped and aimed at the tumor from different directions. Each beam alone is fairly weak, which makes it less likely to damage normal tissues, but the beams converge at the tumor to give a higher dose of radiation there.

**Intensity modulated radiation therapy (IMRT):** IMRT is an advanced form of 3D therapy. It uses a computer-driven machine that actually moves around the patient as it delivers radiation. In addition to shaping the beams and aiming them at the tumor from several angles, the intensity (strength) of the beams can be adjusted to minimize the dose reaching the most sensitive nearby normal tissues. This may let the doctor deliver a higher dose to the tumor. Many major hospitals and cancer centers now use IMRT as the standard way to deliver external beam radiation.

### **Brachytherapy**

Internal radiation therapy, also known as brachytherapy, uses radioactive material placed directly into or near the cancer. Brachytherapy may be used alone or in combination with external beam radiation therapy. It is rarely used to treat laryngeal and hypopharyngeal cancer.

### **Side effects of radiation therapy**

Many people treated with radiation to the neck and throat area have problems with painful sores in the mouth and throat. These sores can make eating and drinking very hard, and can lead to weight loss and malnutrition. The sores heal with time after the radiation has stopped.

Some less severe side effects of radiation therapy may include:

- Mild skin problems (similar to a sunburn)
- Dry mouth
- Sore throat
- Worsening of hoarseness
- Trouble swallowing

- Loss of taste
- Possible breathing trouble from swelling of the larynx
- Tiredness

Most of these side effects go away after a short while. Side effects of radiation tend to be worse if chemotherapy is given at the same time. Tell your doctor about any side effects you have because there are often ways to help.

Radiation can worsen any tooth problems that already exist. Depending on the expected radiation plan and the condition of your teeth, some or all of your teeth may need to be removed before starting treatment.

Radiation aimed at areas near the salivary glands may damage them, leading to dry mouth that does not improve with time. In addition to discomfort and problems swallowing, a dry mouth can lead to tooth decay. People with dry mouth after radiation must pay close attention to their oral health.

When radiation is used as the main treatment for cancer of the larynx, it may very rarely lead to breakdown of the cartilage in the throat. If this occurs, the patient may need to be treated with a tracheostomy or laryngectomy.

For more information on radiation therapy, see our document, *Understanding Radiation Therapy: A Guide for Patients and Families*.

## Chemotherapy for laryngeal and hypopharyngeal cancers

Chemotherapy (chemo) uses anti-cancer drugs that are injected into a vein or given by mouth. These drugs enter the bloodstream and reach all areas of the body, making this treatment potentially useful for cancers that have metastasized (spread) to organs beyond the head and neck.

Chemo may be used in different situations for laryngeal and hypopharyngeal cancers.

- It is often given along with radiation as the main treatment for more advanced cancers of the larynx. This treatment, called *chemoradiation*, can allow some patients to avoid laryngectomy and retain the ability to speak.
- It may be used (as part of chemoradiation) after a cancer is removed with surgery, to try to kill any small areas of cancer that may remain and lower the chance the cancer will come back. This is called *adjuvant treatment*.
- Chemotherapy is also sometimes used to help relieve symptoms from cancers that are too large or have spread too far to be completely removed with surgery.

## **Conventional chemotherapy**

Standard chemo drugs work by attacking cells that are dividing quickly, including cancer cells. The chemo drugs used most often for cancers of the larynx and hypopharynx include:

- Cisplatin
- Carboplatin
- 5-fluorouracil (5-FU)
- Docetaxel (Taxotere®)
- Paclitaxel (Taxol®)
- Bleomycin
- Methotrexate
- Ifosfamide

Depending on the situation (including the extent of the cancer, the person's overall health, and whether chemo is combined with radiation therapy), these drugs may be used alone or they may be combined with 1 or 2 other chemo drugs.

Doctors give chemotherapy in cycles, with each period of treatment followed by a rest period to allow the body time to recover. Each chemotherapy cycle typically lasts for a few weeks.

### **Possible side effects**

Chemo drugs attack cells that are dividing quickly, which is why they work against cancer cells. But other cells in the body, such as those in the bone marrow (where new blood cells are made), the lining of the mouth and intestines, and the hair follicles, also divide quickly. These cells are also likely to be affected by chemo, which can lead to side effects. Side effects depend on the specific drugs used, their dose, and the length of treatment. Common side effects of chemo include:

- Nausea and vomiting
- Loss of appetite
- Hair loss
- Mouth sores
- Diarrhea
- An increased chance of infection (from a shortage of white blood cells)
- Problems with bleeding or bruising (from a shortage of blood platelets)

- Fatigue or shortness of breath (from low red blood cell counts)

Along with the risks above, some side effects are seen more often with certain chemo drugs. For example, 5-FU often causes diarrhea. Cisplatin can cause nerve damage (called neuropathy), leading to hearing loss as well as numbness and tingling in the hands and feet. This often improves once treatment is stopped, but it can persist a long time in some cases.

Although most side effects improve once treatment is stopped, some can last a long time or even be permanent. If your doctor plans treatment with chemo you should be sure to discuss the drugs that will be used and the possible side effects. Once chemo is started, let your health care team know if you have side effects, so they can be treated. There are ways to prevent or treat many of the side effects of chemotherapy. For example, many good drugs are available to help prevent or treat nausea and vomiting.

## **Targeted therapy for laryngeal and hypopharyngeal cancers**

As researchers have learned more about the changes in cells that cause cancer, they have been able to develop newer drugs that specifically target these changes. Targeted drugs work differently from standard chemo drugs. They often have different (and less severe) side effects.

Cetuximab (Erbix®) is a monoclonal antibody (a man-made version of an immune system protein) that targets epidermal growth factor receptor (EGFR), a protein on the surface of certain cells that helps them grow and divide. Laryngeal and hypopharyngeal cancer cells often have more than normal amounts of EGFR. By blocking EGFR, cetuximab can slow or stop cell growth.

Cetuximab may be combined with radiation therapy for some earlier stage cancers. For more advanced cancers, it may be combined with standard chemotherapy drugs such as cisplatin, or it may be used by itself.

Cetuximab is given by infusion into a vein (IV), usually once a week. A rare but serious side effect of cetuximab is an allergic reaction during the first infusion, which could cause problems with breathing and low blood pressure. You may be given medicine before treatment to help prevent this. Many people develop skin problems such as an acne-like rash on the face and chest during treatment, which in some cases can lead to infections. Other side effects may include headache, tiredness, fever, and diarrhea.

Studies of other targeted therapy drugs to treat laryngeal and hypopharyngeal cancers are going on now.

## **Chemoradiotherapy**

Chemoradiotherapy (also called *chemoradiation*) is chemotherapy given at the same time as radiation. This combination has been shown to shrink tumors more effectively than either treatment alone. It can be used in different situations for laryngeal and hypopharyngeal cancers.

- It may be an option as the main treatment instead of surgery to treat some laryngeal and hypopharyngeal cancers. If the tumor goes away completely with chemoradiation, no other treatment may be needed. But if some cancer remains, surgery may then be recommended.
- It may be used after surgery to try to lower the risk that the cancer will come back. This may be recommended if cancer is found at the edges (margins) of the removed surgery specimen, or if the cancer has other features that make it more likely to come back after surgery.

A commonly used regimen is to give a dose of cisplatin every 3 weeks (for a total of 3 doses) during radiation. Another approach is to first give chemotherapy with cisplatin plus other drugs (such as 5-FU, or 5-FU and docetaxel). In patients who cannot tolerate chemo combined with radiation, cetuximab is often used instead.

For more information on chemotherapy, see our document, *Understanding Chemotherapy: A Guide for Patients and Families*.

## Clinical trials for laryngeal and hypopharyngeal cancers

You may have had to make a lot of decisions since you've been told you have cancer. One of the most important decisions you will make is choosing which treatment is best for you. You may have heard about clinical trials being done for your type of cancer. Or maybe someone on your health care team has mentioned a clinical trial to you.

Clinical trials are carefully controlled research studies that are done with patients who volunteer for them. They are done to get a closer look at promising new treatments or procedures.

If you would like to take part in a clinical trial, you should start by asking your doctor if your clinic or hospital conducts clinical trials. You can also call our clinical trials matching service for a list of clinical trials that meet your medical needs. You can reach this service at 1-800-303-5691 or on our Web site at [www.cancer.org/clinicaltrials](http://www.cancer.org/clinicaltrials). You can also get a list of current clinical trials by calling the National Cancer Institute's Cancer Information Service toll-free at 1-800-4-CANCER (1-800-422-6237) or by visiting the NCI clinical trials Web site at [www.cancer.gov/clinicaltrials](http://www.cancer.gov/clinicaltrials).

There are requirements you must meet to take part in any clinical trial. If you do qualify for a clinical trial, it is up to you whether or not to enter (enroll in) it.

Clinical trials are one way to get state-of-the-art cancer treatment. Sometimes they may be the only way to get access to some newer treatments. They are also the only way for doctors to learn better methods to treat cancer. Still, they are not right for everyone.

You can get a lot more information on clinical trials in our document called *Clinical Trials: What You Need to Know*. You can read it on our Web site or call our toll-free number (1-800-227-2345) and have it sent to you.

# Complementary and alternative therapies for laryngeal and hypopharyngeal cancers

When you have cancer you are likely to hear about ways to treat your cancer or relieve symptoms that your doctor hasn't mentioned. Everyone from friends and family to Internet groups and Web sites may offer ideas for what might help you. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

## What exactly are complementary and alternative therapies?

Not everyone uses these terms the same way, and they are used to refer to many different methods, so it can be confusing. We use *complementary* to refer to treatments that are used *along with* your regular medical care. *Alternative* treatments are used *instead of* a doctor's medical treatment.

**Complementary methods:** Most complementary treatment methods are not offered as cures for cancer. Mainly, they are used to help you feel better. Some methods that are used along with regular treatment are meditation to reduce stress, acupuncture to help relieve pain, or peppermint tea to relieve nausea. Some complementary methods are known to help, while others have not been tested. Some have been proven not to be helpful, and a few have even been found harmful.

**Alternative treatments:** Alternative treatments may be offered as cancer cures. These treatments have not been proven safe and effective in clinical trials. Some of these methods may pose danger, or have life-threatening side effects. But the biggest danger in most cases is that you may lose the chance to be helped by standard medical treatment. Delays or interruptions in your medical treatments may give the cancer more time to grow and make it less likely that treatment will help.

## Finding out more

It is easy to see why people with cancer think about alternative methods. You want to do all you can to fight the cancer, and the idea of a treatment with few or no side effects sounds great. Sometimes medical treatments like chemotherapy can be hard to take, or they may no longer be working. But the truth is that most of these alternative methods have not been tested and proven to work in treating cancer.

As you consider your options, here are 3 important steps you can take:

- Look for "red flags" that suggest fraud. Does the method promise to cure all or most cancers? Are you told not to have regular medical treatments? Is the treatment a "secret" that requires you to visit certain providers or travel to another country?
- Talk to your doctor or nurse about any method you are thinking about using.
- Contact us at 1-800-227-2345 to learn more about complementary and alternative methods in general and to find out about the specific methods you are looking at.

## **The choice is yours**

Decisions about how to treat or manage your cancer are always yours to make. If you want to use a non-standard treatment, learn all you can about the method and talk to your doctor about it. With good information and the support of your health care team, you may be able to safely use the methods that can help you while avoiding those that could be harmful.

## **Treating laryngeal and hypopharyngeal cancers by stage**

Most of the time, the treatment of laryngeal or hypopharyngeal cancer is based on its stage – how far it has spread in the body. But other factors, such as a person's overall health, may also affect treatment options. Talk to your doctor if you have any questions about the treatment plan he or she recommends.

### **Laryngeal cancers**

#### **Stage 0**

These cancers are almost always glottic (vocal cord) cancers that are found early because of voice changes.

This stage is nearly always curable with either vocal cord stripping, laser surgery, or radiation therapy. The patient is then watched closely to see if the cancer returns. If the cancer comes back after stripping or laser surgery, radiation can be used.

Almost all patients at this stage can be cured without extensive surgery. But it is important for them to realize that if they smoke, continuing to do so increases the risk that a new cancer will develop.

#### **Stage I and II laryngeal cancers**

Most patients with stage I and II laryngeal cancers can be successfully treated without totally removing their larynx.

Either radiation alone (without surgery) or partial laryngectomy is successful in treating most patients. However, voice results tend to be better with radiation therapy than with partial laryngectomy, and the complication rate for surgery tends to be greater than for radiation treatment alone. Many doctors use radiation therapy for smaller cancers, only using surgery for cancers that come back after treatment.

The treatment for glottic (vocal cord) cancers and supraglottic cancers (those starting above the vocal cords) is slightly different.

Glottic cancers do not usually require further treatment after radiation or surgery unless there are signs the cancer has returned. In fact, some early glottic cancers may be treated by removing the cancerous vocal cord, or even by laser surgery.

Supraglottic cancers are more likely to spread to the neck lymph nodes, so the nodes are often treated as well. If you are having surgery for your tumor, then the surgeon will also likely remove lymph nodes from your neck. If your treatment is to be radiation therapy alone, you will also receive radiation therapy to the lymph nodes in the neck. If, after surgery for a supraglottic cancer, the cancer is found to have features that make it more likely to come back, further treatment such as radiation therapy or chemoradiation may be recommended.

### **Stage III and IV laryngeal cancers**

Stages III and IV laryngeal cancers generally require treatment with some combination of surgery, radiation, and/or chemotherapy.

Unless the cancer is very advanced, initial treatment is usually surgery or chemoradiation. Radiation therapy alone may be an option for people who cannot tolerate more intensive treatments.

Surgical treatment of these tumors is almost always complete removal of the larynx, but a small group of laryngeal cancers may still be treated by partial laryngectomy.

These cancers have a higher risk of spreading to nearby lymph nodes in the neck than earlier stage cancers, so these lymph nodes are often removed along with the tumor if surgery is being used to treat the cancer. Radiation therapy, often given with chemo, may be required after surgery, particularly if the cancer has spread to the lymph nodes or has other features that make it more likely to come back.

Instead of using surgery as the first step, many doctors now prefer to start treatment with radiation and chemotherapy. If any cancer remains after treatment, surgery can then be done to try to remove it. This approach works as well as surgery (laryngectomy) alone to treat the cancer, but it may offer a chance to save the larynx. If the framework of the larynx (such as the thyroid cartilage) has been destroyed by the cancer, the larynx may never work normally again, no matter what treatment is chosen. In these cases, surgery to remove the larynx may be the best treatment approach.

Another option may be to start with chemotherapy alone, which also known as induction chemotherapy. If the tumor shrinks, radiation therapy (sometimes along with more chemo) is then given. If the tumor doesn't shrink, surgery is usually the next treatment. But because some studies have shown better results when radiation is part of the initial treatment, not all doctors agree with the approach of starting with chemotherapy alone.

Cancers that are too large or have spread too far to be completely removed by surgery are often treated with radiation, usually combined with chemotherapy. Sometimes, if the tumor shrinks enough, surgery of lymph nodes in the neck may be an option. But for many advanced cancers, the goal of treatment may be to stop or slow the growth of the cancer for as long as possible and to help relieve any symptoms it may be causing.

## Hypopharyngeal cancers

These cancers are often harder to treat than laryngeal cancers. Because they do not cause symptoms early, most are diagnosed in an advanced stage. Tumors in this region also have a high likelihood of spreading to the lymph nodes, even when there is no obvious mass in the neck. Because of this risk, treatment of the lymph nodes in the neck is recommended for patients with hypopharyngeal cancer.

### **Stage I and some early stage II hypopharyngeal cancers**

The main options for initial treatment of small tumors are radiation and surgery. Larger tumors are typically treated with surgery.

Surgery would include removing all or part of the pharynx and lymph nodes in the neck. The larynx is sometimes removed as well. Patients who have a high chance of the cancer returning (based on what is found during surgery) may then be treated with radiation or chemoradiation.

Patients who receive radiation as their main treatment will be assessed after the treatment is complete. If there is still cancer in the hypopharynx, surgery will be done.

### **Stage III and IV hypopharyngeal cancers**

These cancers are often treated with extensive surgery followed by radiation alone or chemoradiation.

Another option is to start treatment with chemoradiation. If any cancer remains after treatment, surgery can then be done to try to remove it.

A third option is to give chemotherapy as the first treatment, also known as induction chemotherapy. Chemotherapy is then combined with radiation therapy. If the lymph nodes remain enlarged after chemoradiotherapy, they may be removed with a lymph node dissection.

Cancers that are too large or have spread too far to be completely removed by surgery are often treated with radiation, usually combined with chemotherapy. In some cases, if the tumor shrinks enough, surgery of lymph nodes in the neck may be an option. But for many advanced cancers, the goal of treatment may be to stop or slow the growth of the cancer for as long as possible and to help relieve any symptoms it may be causing.

## Recurrent laryngeal and hypopharyngeal cancers

Cancer is called *recurrent* when it comes back after treatment. Recurrence can be local (in or near the same place it started) or distant (spread to organs such as the lungs or bone). Treatment options for patients whose laryngeal or hypopharyngeal cancers come back after treatment depend mainly on what the initial treatment was and on where the cancer recurs (local recurrence or distant recurrence).

Local recurrences in patients who have already had limited surgery such as partial laryngectomy can be treated with more extensive surgery (such as total laryngectomy) or with radiation therapy. If cancer comes back locally after radiation therapy, the usual treatment is total laryngectomy, but additional radiation therapy is sometimes used.

For distant recurrences and for local recurrences that have not responded to radiation therapy and surgery, chemotherapy is the main treatment if a person can tolerate it. Because these cancers are often hard to treat, patients may want to consider taking part in clinical trials of newer treatments as well.

## More treatment information

For more details on treatment options – including some that may not be addressed in this document – the National Comprehensive Cancer Network (NCCN) and the National Cancer Institute (NCI) are good sources of information.

The NCCN, made up of experts from many of the nation's leading cancer centers, develops cancer treatment guidelines for doctors to use when treating patients. These are available on the NCCN Web site ([www.nccn.org](http://www.nccn.org)). (Information on laryngeal and hypopharyngeal cancers is found in the NCCN Head and Neck Cancers guideline.)

The NCI provides treatment information via telephone (1-800-4-CANCER) and its Web site ([www.cancer.gov](http://www.cancer.gov)). Information for patients as well as more detailed information intended for use by cancer care professionals is also available on [www.cancer.gov](http://www.cancer.gov).

## What should you ask your doctor about laryngeal or hypopharyngeal cancer?

It is important to have frank, open discussions with your cancer care team. They want to answer all of your questions, no matter how minor they might seem. For instance, consider these questions:

- Where is my cancer located?
- Has my cancer spread beyond the primary site?
- What is the stage of my cancer, and what does that mean in my case?
- Do I need other tests before we can decide on treatment?
- Are there other doctors I need to see?
- How much experience do you have treating this type of cancer?
- What treatment choices do I have?
- Are you aware of any clinical trials I might be eligible for?
- What do you recommend and why?

- What is the goal of the treatment?
- What are the chances my cancer can be cured with treatment?
- How quickly do we need to decide on treatment?
- What should I do to be ready for treatment?
- How long will treatment last? What will it involve? Where will it be done?
- What risks or side effects that I should expect? How long are they likely to last?
- How will this treatment affect my voice? If my larynx is removed, what are the options for restoring my voice?
- How will treatment affect my daily activities?
- What can we do if the treatment doesn't work or if the cancer recurs?
- What type of follow-up will I need after treatment?
- Where can I find more information and support?

In addition to these sample questions, be sure to write down some of your own. For instance, you might want more information about recovery times so that you can plan your work or activity schedule. Or you may want to ask about getting a second opinion.

## What happens after treatment for laryngeal or hypopharyngeal cancer?

For some people with laryngeal or hypopharyngeal cancer, treatment may remove or destroy the cancer. Completing treatment can be both stressful and exciting. You may be relieved to finish treatment, but find it hard not to worry about cancer growing or coming back. (When cancer comes back after treatment, it is called *recurrence*.) This is a very common concern in people who have had cancer.

It may take a while before your fears lessen. But it may help to know that many cancer survivors have learned to live with this uncertainty and are leading full lives. Our document, *Living With Uncertainty: The Fear of Cancer Recurrence*, gives more detailed information on this.

For other people, the cancer may never go away completely. These people may get regular treatments with chemotherapy, radiation therapy, or other therapies to help keep the cancer in check for as long as possible. Learning to live with cancer as more of a chronic disease can be difficult and very stressful. It has its own type of uncertainty.

## Follow-up care

If you have completed treatment, your doctors will still want to watch you closely. It is very important to go to all follow-up appointments. People with cancer of the larynx or hypopharynx are at risk for developing recurrences or new cancers in the head and neck area, so they must be observed closely after treatment. Your health care team will discuss which tests should be done and how often based on the type and initial stage of your cancer, the type of treatment you received, and the response to that treatment.

These cancers recur most often in the first 2 years after treatment, so doctor visits will be more frequent during this time. Your head and neck will be examined (often including laryngoscopy) about every other month during the first year after treatment. Follow-up may then be spread out to 3-, 6-, and 12-month intervals as time progresses if there is no evidence of recurrence. Chest x-rays and other imaging tests may be used to watch for a recurrence or a new tumor, especially if new symptoms develop.

If your thyroid gland received radiation as part of your treatment, you may also need regular blood tests to check its function.

Almost any cancer treatment can have side effects. Some last for a few weeks to several months, but others can last the rest of your life. Don't hesitate to tell your cancer care team about any symptoms or side effects that bother you so they can help you manage them.

It is very important to report any new symptoms to the doctor right away, because they may prompt your doctor to do tests that could help find recurrent cancer as early as possible, when the likelihood of successful treatment is greatest.

If cancer does recur, treatment will depend on the location of the cancer and what treatments you've had before. For more information on how recurrent cancer is treated, see the section, "Recurrent laryngeal and hypopharyngeal cancers." For more general information on dealing with a recurrence, you may also want to see the document, *When Your Cancer Comes Back: Cancer Recurrence*. You can get this document by calling 1-800-227-2345.

## Restoring speech after total laryngectomy

After a total laryngectomy, you will not be able to speak using your vocal cords. However, there are several options for restoring speech after total laryngectomy. Losing your voice box to cancer does not mean you lose your ability to talk, but learning to speak again will take time and effort, and your voice will not sound the same. You will need to see a speech therapist who is trained in rehabilitating people who have had a laryngectomy. The speech therapist will play a major role in helping you to learn to speak.

**Esophageal speech:** After a laryngectomy, your windpipe (trachea) has been separated from the throat, so you can no longer expel air from the lungs through your mouth to speak. With training, some patients learn to swallow air and force it through their mouth. As the air passes through the throat it will cause vibrations which, with training, people

can turn into speech. This is the most basic form of speech rehabilitation. New devices and surgical techniques often make learning esophageal speech unnecessary.

**Tracheo-esophageal puncture (TEP):** This is the most common way that surgeons try to restore speech. It can be done either during the surgery to treat the cancer or later. This procedure creates a connection between the windpipe and food pipe through a small puncture at the stoma site. A small one-way valve placed into this puncture restores your ability to force air from your lungs into your mouth. After this operation, you can cover your stoma with a finger to force air out of your mouth, producing sustained speech. This takes practice, but after surgery you can work closely with a speech therapist to learn this technique.

**Electrolarynx:** If you cannot have a TEP for medical reasons, or while you are learning to use your TEP voice, you may use an electrical device to produce a mechanical voice. The battery-operated device is either placed in the corner of the mouth or against the skin of the neck. When you press a button on the device, it will make a vibrating sound. By moving your mouth and tongue, you can form this sound into words. You will need training with a speech therapist to learn to use it properly.

## Stoma (tracheostomy) care following total laryngectomy

Having a stoma (tracheostomy) means that the air you breathe in and out will no longer pass through your nose or mouth, which would normally help moisten, warm, and filter the air (removing dust and other particles). After a laryngectomy and tracheostomy, the air reaching the lungs will be dryer and cooler. This may irritate the lining of the breathing tubes and cause thick or crusty mucus to build up.

It is important to learn how to take care of your stoma. You will need to use a humidifier over the stoma as much as possible, especially soon after the operation, until the airway lining has a chance to adjust to the drier air now reaching it. You will also need to learn how to suction out and clean your stoma to help keep your airway open. Your doctors, nurses, and other health care professionals can teach you how to care for and protect your stoma, which includes precautions to keep water from entering the windpipe while showering or bathing, as well as keeping small particles out of the windpipe.

Support groups formed by other patients who have also had a laryngectomy can provide essential information on stoma care and use of products for protecting and cleaning the stoma.

## Help for trouble swallowing and nutrition problems

Cancers of the larynx or hypopharynx and their treatments can sometimes cause problems such as trouble swallowing, dry mouth, or even loss of teeth. This can make it hard to eat, which can lead to weight loss and weakness due to poor nutrition.

Some people may need to adjust what they eat during and after treatment. Some may even need a feeding tube placed in the stomach for a short time after treatment. A team of doctors and nutritionists can work with you to provide nutritional supplements and

information about your individual nutritional needs. This can help you maintain your weight and nutritional intake.

## Sexual impact of laryngectomy

Laryngectomy changes not only your physical appearance with the stoma but also your speech and breathing. Sexual intimacy may be affected because of uncomfortable feelings about your appearance. However, there are things you can do to decrease these feelings during intimacy.

A scarf, ascot, or turtleneck shirt can look nice and hide the stoma cover. Even during sexual activity, a stoma cover may look more appealing than a bare stoma.

You can lessen odors from the stoma by avoiding garlic or spicy foods and by wearing perfume, cologne, after-shave, or lotion.

Sometimes problems speaking interfere with communication for some couples. If you have learned esophageal speech, talking during lovemaking is not a big problem. It does take more effort, though, and you may lose some of the emotional overtones. A speech aid built into the stoma might also work well. However, neither method lets you whisper romantically in your partner's ear.

If you use a hand-held speech aid, communication during sex is likely to be awkward and distracting. You can say a great deal sexually, however, by guiding your partner's hand or using body language.

Talking is not needed in many sexual situations. With a new partner, you may want to discuss the kinds of touching and positions you like before you start making love.

## Seeing a new doctor

At some point after your cancer diagnosis and treatment, you may find yourself seeing a new doctor who does not know anything about your medical history. It is important that you be able to give your new doctor the details of your diagnosis and treatment. Make sure you have this information handy:

- A copy of your pathology report(s) from any biopsies or surgeries
- Copies of imaging tests (CT or MRI scans, etc.), which can usually be stored on a CD, DVD, etc.
- If you had surgery, a copy of your operative report(s)
- If you were in the hospital, a copy of the discharge summary that doctors prepare when patients are sent home
- If you had radiation therapy, a summary of the type and dose of radiation and when and where it was given
- If you had chemotherapy, a list of the drugs, drug doses, and when you took them

It is also important to keep health insurance. Tests and doctor visits cost a lot, and even though no one wants to think of their cancer coming back, this could happen.

## **Lifestyle changes**

You can't change the fact that you have had cancer. What you can change is how you live the rest of your life – making choices to help you stay healthy and feel as well as you can. This can be a time to look at your life in new ways. Maybe you are thinking about how to improve your health over the long term. Some people even start during cancer treatment.

### **Making healthier choices**

For many people, a diagnosis of cancer helps them focus on their health in ways they may not have thought much about in the past. Are there things you could do that might make you healthier? Maybe you could try to eat better or get more exercise. Maybe you could cut down on the alcohol, or give up tobacco. Even things like keeping your stress level under control may help. Now is a good time to think about making changes that can have positive effects for the rest of your life. You will feel better and you will also be healthier.

You can start by working on those things that worry you most. Get help with those that are harder for you. For instance, if you are thinking about quitting smoking and need help, call the American Cancer Society for information and support. This tobacco cessation and coaching service can help increase your chances of quitting for good.

### **Eating better**

Eating right can be hard for anyone, but it can get even tougher during and after cancer treatment. Treatment may change your sense of taste. Nausea can be a problem. You may not feel like eating and lose weight when you don't want to. Or you may have gained weight that you can't seem to lose. All of these things can be very frustrating.

If treatment caused weight changes or eating or taste problems, do the best you can and keep in mind that these problems usually get better over time. You may find it helps to eat small portions every 2 to 3 hours until you feel better. You may also want to ask your cancer team about seeing a dietitian, an expert in nutrition who can give you ideas on how to deal with these treatment side effects.

One of the best things you can do after cancer treatment is put healthy eating habits into place. You may be surprised at the long-term benefits of some simple changes, like increasing the variety of healthy foods you eat. Getting to and staying at a healthy weight, eating a healthy diet, and limiting your alcohol intake may lower your risk for a number of types of cancer, as well as having many other health benefits.

## Rest, fatigue, and exercise

Extreme tiredness, called *fatigue*, is very common in people treated for cancer. This is not a normal tiredness, but a "bone-weary" exhaustion that doesn't get better with rest. For some people, fatigue lasts a long time after treatment, and can make it hard for them to exercise and do other things they want to do. But exercise can help reduce fatigue. Studies have shown that patients who follow an exercise program tailored to their personal needs feel better physically and emotionally and can cope better, too.

If you were sick and not very active during treatment, it is normal for your fitness, endurance, and muscle strength to decline. Any plan for physical activity should fit your own situation. An older person who has never exercised will not be able to take on the same amount of exercise as a 20-year-old who plays tennis twice a week. If you haven't exercised in a few years, you will have to start slowly – maybe just by taking short walks.

Talk with your health care team before starting anything. Get their opinion about your exercise plans. Then, try to find an exercise buddy so you're not doing it alone. Having family or friends involved when starting a new exercise program can give you that extra boost of support to keep you going when the push just isn't there.

If you are very tired, you will need to balance activity with rest. It is OK to rest when you need to. Sometimes it's really hard for people to allow themselves to rest when they are used to working all day or taking care of a household, but this is not the time to push yourself too hard. Listen to your body and rest when you need to. (For more information on dealing with fatigue, please see *Fatigue in People With Cancer* and *Anemia in People With Cancer*.)

Keep in mind exercise can improve your physical and emotional health.

- It improves your cardiovascular (heart and circulation) fitness.
- Along with a good diet, it will help you get to and stay at a healthy weight.
- It makes your muscles stronger.
- It reduces fatigue and helps you have more energy.
- It can help lower anxiety and depression.
- It can make you feel happier.
- It helps you feel better about yourself.

And long term, we know that getting regular physical activity plays a role in helping to lower the risk of some cancers, as well as having other health benefits.

## **Can I lower my risk of the cancer progressing or coming back?**

Most people want to know if there are specific lifestyle changes they can make to reduce their risk of their cancer progressing or coming back. For many cancers there is little solid evidence to guide people. This doesn't mean that nothing will help—it's just that for the most part this is an area that hasn't been well studied. Most studies have looked at lifestyle changes as ways of preventing cancer in the first place, not slowing it down or preventing it from coming back.

Tobacco and alcohol use have clearly been linked to laryngeal and hypopharyngeal cancers, so not smoking or drinking may help reduce your risk of the cancer returning. If you smoke, it is very important to quit. Quitting may also reduce your chance of developing other new cancers (especially other head and neck or lung cancers), which is a serious problem among laryngeal and hypopharyngeal cancer survivors. Quitting can also help improve your appetite and your overall health. If you want to quit smoking and need help, call the American Cancer Society at 1-800-227-2345.

Adopting other healthy behaviors such as eating well, getting regular physical activity, and maintaining a healthy weight may help as well, but no one knows for sure. However, we do know that these types of changes can have positive effects on your health that can extend beyond your risk of cancer.

## **How about your emotional health?**

During and after treatment, you may find yourself overcome with many different emotions. This happens to a lot of people.

You may find yourself thinking about death and dying. Or maybe you're more aware of the effect the cancer has on your family, friends, and career. You may take a new look at your relationships with those around you. Unexpected issues may also cause concern. For instance, you may see your health care team less often after treatment and have more time on your hands. These changes can make some people anxious.

Almost everyone who is going through or has been through cancer can benefit from getting some type of support. You need people you can turn to for strength and comfort. Support can come in many forms: family, friends, cancer support groups, church or spiritual groups, online support communities, or one-on-one counselors. What's best for you depends on your situation and personality. Some people feel safe in peer-support groups or education groups. Others would rather talk in an informal setting, such as church. Others may feel more at ease talking one-on-one with a trusted friend or counselor. Whatever your source of strength or comfort, make sure you have a place to go with your concerns.

The cancer journey can feel very lonely. It is not necessary or good for you to try to deal with everything on your own. And your friends and family may feel shut out if you do not include them. Let them in, and let in anyone else who you feel may help. If you aren't sure who can help, call your American Cancer Society at 1-800-227-2345 and we can put you in touch with a group or resource that may work for you.

## If treatment is no longer working

If cancer keeps growing or comes back after one kind of treatment, it may be possible to try another treatment plan that might still cure the cancer, or at least shrink the tumors enough to help you live longer and feel better. But when a person has tried many different treatments and the cancer has not gotten any better, the cancer tends to become resistant to all treatment. If this happens, it's important to weigh the possible limited benefits of a new treatment against the possible downsides, including treatment side effects. Everyone has their own way of looking at this.

This is likely to be the hardest part of your battle with cancer — when you have been through many medical treatments and nothing's working anymore. Your doctor may offer you new options, but at some point you may need to consider that treatment is not likely to improve your health or change your outcome or survival.

If you want to continue to get treatment for as long as you can, you need to think about the odds of treatment having any benefit and how this compares to the possible risks and side effects. In many cases, your doctor can estimate how likely it is the cancer will respond to treatment you are considering. For instance, the doctor may say that more treatment might have about a 1 in 100 chance of working. Some people are still tempted to try this. But it is important to think about and understand your reasons for choosing this plan.

No matter what you decide to do, it is important that you feel as good as you can. Make sure you are asking for and getting treatment for any symptoms you might have, such as nausea or pain. This type of treatment is called *palliative care*.

Palliative care helps relieve symptoms, but is not expected to cure the disease. It can be given along with cancer treatment, or can even be cancer treatment. The difference is its purpose — the main purpose of palliative care is to improve the quality of your life, or help you feel as good as you can for as long as you can. Sometimes this means using drugs to help with symptoms like pain or nausea. Sometimes, though, the treatments used to control your symptoms are the same as those used to treat cancer. For instance, radiation might be used to help relieve bone pain caused by cancer that has spread to the bones. Or chemo might be used to help shrink a tumor and keep it from blocking the bowels. But this is not the same as treatment to try to cure the cancer.

At some point, you may benefit from hospice care. This is special care that treats the person rather than the disease; it focuses on quality rather than length of life. Most of the time, it is given at home. Your cancer may be causing problems that need to be managed, and hospice focuses on your comfort. You should know that while getting hospice care often means the end of treatments such as chemo and radiation, it doesn't mean you can't have treatment for the problems caused by your cancer or other health conditions. In hospice the focus of your care is on living life as fully as possible and feeling as well as you can at this difficult time. You can learn more about hospice in our document called *Hospice Care*.

Staying hopeful is important, too. Your hope for a cure may not be as bright, but there is still hope for good times with family and friends — times that are filled with happiness

and meaning. Pausing at this time in your cancer treatment gives you a chance to refocus on the most important things in your life. Now is the time to do some things you've always wanted to do and to stop doing the things you no longer want to do. Though the cancer may be beyond your control, there are still choices you can make.

## What's new in laryngeal and hypopharyngeal cancer research and treatment?

Research into the causes, prevention, and treatment of laryngeal and hypopharyngeal cancers is now being done at many medical centers, university hospitals, and other institutions across the nation.

### DNA changes in laryngeal and hypopharyngeal cancer

A great deal of research is being done to better understand how changes in the DNA of certain genes cause cells in the larynx or hypopharynx to become cancerous. The *p53* tumor suppressor gene is often altered in these cancers. Changes in this gene contribute to the aggressiveness of many head and neck cancers.

Tests to detect *p53* gene alterations may someday allow early detection of laryngeal and hypopharyngeal tumors. These tests may also be used to better define surgical margins (check to see if all cancer cells have been removed) and to determine which tumors may respond better to surgery or radiation therapy. These tests are still experimental and are not used in the routine care of cancer patients at this time.

Changes in several other genes have recently been found in cancers of the larynx or hypopharynx. These include the *p16*, *NOTCH1*, and *cyclin D1* genes. Researchers are hopeful that this information might lead to better tests for early detection and to ideas for new targeted treatments.

### Chemoprevention

Chemoprevention is the use of drugs to stop cancer from developing or from recurring once it has been treated.

Researchers are now trying to find out if certain drugs, vitamins, or other supplements can help prevent precancerous lesions from developing into cancers, but so far studies have not been successful.

In people whose cancer has been removed or destroyed with treatment, development of a second tumor in the head and neck area remains an important risk. Various drugs and supplements are being tested to see if they can reduce the risk of developing a new cancer. Retinoid analogs (chemicals related to vitamin A) have been heavily studied for this purpose, but the results so far have been disappointing.

## Treatment

Several promising new forms of treatment are likely to make therapy more effective and less burdensome in the coming years.

### **Surgery and radiation therapy**

Doctors continue to refine surgery techniques to try to limit the amount of normal tissue that is removed along with the tumor. This may help limit the side effects after treatment.

One new surgery technique now being studied for some early stage cancers is transoral robotic surgery. For this surgery, the surgeon operates by precisely moving robotic arms holding long surgical tools that are passed down the throat. This technique requires smaller incisions, so if it proves successful it might lessen the side effects from surgery. This approach is most commonly being used to treat pharyngeal tumors.

Doctors also continue to improve radiation therapy techniques. This is very important for cancers in the head and neck, where there are often a lot of important structures in a very small space. Using techniques such as intensity modulated radiation therapy (IMRT), doctors can now target a tumor more precisely than ever before, while limiting the amount of radiation that reaches nearby normal tissues.

Another new approach to radiation therapy is proton beam therapy, which uses a beam of protons rather than x-rays to kill cancer cells. Unlike x-rays, which release energy both before and after they hit their target, protons cause little damage to tissues they pass through and then release their energy after traveling a certain distance. Doctors can use this property to deliver more radiation to the tumor with less damage to nearby normal tissues. Proton beam therapy requires highly specialized equipment and is not widely available — there are only a handful of proton beam centers in the United States at this time. Most doctors still consider its use to be experimental for laryngeal and hypopharyngeal cancers.

### **Chemotherapy and chemoradiotherapy**

For advanced laryngeal and hypopharyngeal cancers, new chemotherapy delivery systems, such as direct injection into arteries feeding the cancer, are being tested in combination with radiation therapy in an attempt to improve their effectiveness. Newer chemotherapy drugs and drugs already shown to be effective against other cancers are also being tested.

Clinical trials are also studying ways to best combine several chemotherapy drugs together and to combine chemotherapy with radiation therapy. For example, studies are comparing the effectiveness of chemotherapy given before, during, and/or after radiation therapy.

Studies are also looking to see if starting treatment with chemotherapy alone might be useful. If the chemotherapy shrinks the tumor, further chemotherapy and radiation therapy can then be given to try to make it go away completely. If the chemotherapy

doesn't work, then surgery can be recommended. This approach might help spare some people from having to undergo more extensive surgery, but it is still experimental at this time.

## Targeted therapy

Newer targeted therapy drugs attack specific substances in or around cancer cells that help them grow. These drugs work differently from standard chemo drugs. They may work in some cases when chemo drugs don't, and they often have less severe side effects.

**EGFR inhibitors:** Squamous cell cancers of the larynx and hypopharynx (and other head and neck cancers) often have abnormally high levels of epidermal growth factor receptor (EGFR). Cetuximab (Erbix) is an antibody that blocks this receptor. It is already approved by the FDA for the treatment of cancers of the head and neck, including cancer of larynx and hypopharynx. Other EGFR blockers are under study for the treatment of head and neck cancers, including panitumumab (Vectibix®), lapatinib (Tykerb®), and erlotinib (Tarceva®).

These drugs seem to work best when combined with other treatments, such as radiation and chemotherapy.

**Angiogenesis inhibitors:** Tumors need a large blood supply to grow, so they release chemicals that cause new blood vessels to form. Drugs that turn off these signals are called *angiogenesis inhibitors*. Drugs such as bevacizumab (Avastin®) and sunitinib (Sutent®) have been helpful in the treatment of other cancers. They are now being studied for treating head and neck cancers as well.

## Photodynamic therapy

In this treatment, the patient is given a substance that makes the cancer cells more sensitive to light, and then the cancer is exposed to laser light a day later. This is being studied as a treatment for very early stage laryngeal cancer.

# Additional resources for laryngeal and hypopharyngeal cancer

## More information from your American Cancer Society

We have some related information that may also be helpful to you. These materials may be viewed on our Web site or ordered from our toll-free number, 1-800-227-2345.

After Diagnosis: A Guide for Patients and Families (also available in Spanish)

Caring for the Patient With Cancer at Home: A Guide for Patients and Families (also available in Spanish)

Clinical Trials: What You Need to Know

Living With Uncertainty: The Fear of Cancer Recurrence

Pain Control: A Guide for Those With Cancer and Their Loved Ones (also available in Spanish)

Questions About Smoking, Tobacco, and Health (also available in Spanish)

Surgery (also available in Spanish)

Targeted Therapy

Understanding Chemotherapy: A Guide for Patients and Families (also available in Spanish)

Understanding Radiation Therapy: A Guide for Patients and Families (also available in Spanish)

When Your Cancer Comes Back: Cancer Recurrence

The following books are available from the American Cancer Society. Call us at 1-800-227-2345 to ask about cost or to place your order.

*American Cancer Society Complete Guide to Complementary & Alternative Cancer Therapies*

*American Cancer Society Complete Guide to Family Caregiving, Second Edition*

*American Cancer Society Complete Guide to Nutrition for Cancer Survivors*

*American Cancer Society's Guide to Pain Control, Second Edition*

*Cancer in the Family: Helping Children Cope with a Parent's Illness*

*What Helped Me Get Through: Cancer Patients Share Wisdom and Hope*

*What to Eat During Cancer Treatment*

*When the Focus Is on Care: Palliative Care and Cancer*

## National organizations and Web sites\*

In addition to the American Cancer Society, other sources of patient information and support include:

### **International Association of Laryngectomees (IAL)**

Toll-free number: 1-866-425-3678 (1-866-IAL-FORU)

Web site: [www.theial.com](http://www.theial.com)

### **National Cancer Institute**

Toll-free number: 1-800-422-6237 (1-800-4-CANCER) TYY: 1-800-332-8615

Web site: [www.cancer.gov](http://www.cancer.gov)

### **National Coalition for Cancer Survivorship**

Toll-free number: 1-888-650-9127

1-877-NCCS-YES (622-7937) for some publications and Cancer Survivor Toolbox<sup>®</sup> orders

Web site: [www.canceradvocacy.org](http://www.canceradvocacy.org)

### **Support for People with Oral and Head and Neck Cancer, Inc. (SPOHNC)**

Toll-free number: 1-800-377-0928

Web site: [www.spohnc.org](http://www.spohnc.org)

### **WebWhispers**

Web site: [www.webwhispers.org](http://www.webwhispers.org)

*\*Inclusion on this list does not imply endorsement by the American Cancer Society.*

No matter who you are, we can help. Contact us anytime, day or night, for information and support. Call us at **1-800-227-2345** or visit [www.cancer.org](http://www.cancer.org).

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1 · 800 · ACS-2345 or [www.cancer.org](http://www.cancer.org)