Laryngeal and Hypopharyngeal Cancers

What is cancer?

The body is made up of trillions of living cells. Normal body cells grow, divide to make new cells, 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 still 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?

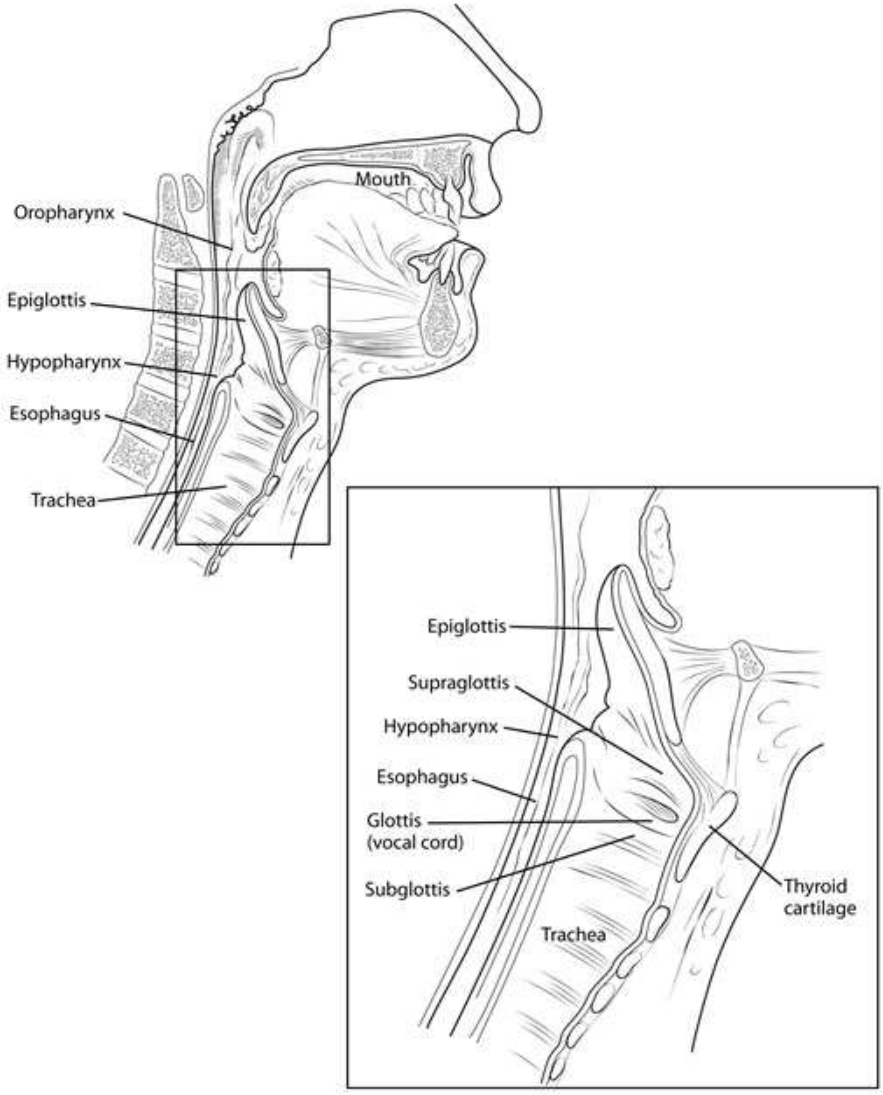
These cancers start in the lower part of the throat. To understand these cancers, it helps to know a little about the larynx and hypopharynx.

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 in the neck, above the opening of the trachea (windpipe). There, it helps keep food and fluids from entering the trachea. The larynx is divided into 3 sections:

- The **supraglottis** is the area above the vocal cords. It contains the epiglottis, which closes off the larynx when you swallow to keep food and fluids from going into your lungs.
- The **glottis** is the area containing the vocal cords.
- The **subglottis** is 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 your airway when you swallow. The epiglottis and vocal cords close tightly when you swallow to keep food and fluids 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 your larynx. The hypopharynx is the entrance into the esophagus (the tube that connects the throat to the stomach). When foods and liquids are swallowed, they pass through the mouth and throat, through the hypopharynx and esophagus, and then into the stomach. The structure of the hypopharynx helps make 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 that start in the hypopharynx are called *hypopharyngeal cancers*. Both types of cancers are discussed here because these 2 structures are so close to each other.

Squamous cell carcinomas

Almost all cancers in the larynx or hypopharynx develop from thin, flat cells called *squamous cells*, which are in the epithelium, the innermost layer lining these 2 structures. Cancer that starts 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 a pre-cancerous condition 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 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?") Most pre-cancerous conditions of the larynx and hypopharynx do not cause symptoms unless they are on the vocal cord(s).

Sometimes dysplasia will progress to 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 nearby tissues and 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 make mucus and saliva to lubricate and moisten the area. Cancer rarely develops from the cells of these glands, but when it does, these cancers have names such as:

- Adenocarcinoma

- Adenoid cystic carcinoma
- Mucoepidermoid carcinoma

These cancers are discussed in our document *Salivary Gland Cancers*.

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 for 2015 are:

- About 13,560 new cases of laryngeal cancer (10,720 in men and 2,840 in women)
- About 3,640 people (2,890 men and 750 women) will die from laryngeal cancer

About 60% of laryngeal cancers start in the glottis (the area containing the vocal cords themselves), while about 35% develop in the supraglottic area (above the vocal cords). The rest develop in either the subglottis (below the vocal cords) or overlap more than one area so that it is hard to tell where they started.

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

The American Cancer Society estimates that about 15,520 new cases of cancer of the pharynx (throat) will occur in 2015 (12,380 in men and 3,140 in women). Only about 3,400 of these will start in the hypopharynx (about 2,725 in men and 675 in women).

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. Some risk factors, like smoking, can be changed. Others, like a person's age or family history, can't be changed.

But risk factors don’t tell us everything. Having a risk factor, or even 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 with other cancers of the mouth and throat (known as *head and neck cancers*). These cancers often have many of the same risk factors, some of which are included below.

Tobacco and alcohol use

Tobacco use is the most important risk factor for head and neck cancers (including cancers of the larynx and hypopharynx). The risk for these cancers 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 your chance of getting these cancers.

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

Moderate or heavy alcohol use (more than 1 drink a day) also increases the risk of these cancers, although not as much as smoking.

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.

If are thinking about quitting smoking and need help, call the American Cancer Society at 1-800-227-2345. A tobacco cessation and coaching service can help increase your chances of quitting for good. More information is also available in the “Stay Away from Tobacco” section of our website.

Poor nutrition

Poor nutrition may increase the risk of getting head and neck cancer. The exact reason for this is not known. Heavy drinkers often have vitamin deficiencies, which may help explain the role of alcohol in increasing risk of these cancers.

Human papilloma virus infection

Human papilloma virus (HPV) is a group of over 150 related viruses. They are called *papilloma viruses* because some of them cause a type of growth called a *papilloma*, more commonly known as a wart.

Infection with certain types of HPV can also cause some forms of cancer, including cancers of the penis, cervix, vulva, vagina, anus, and throat. Other types of HPV cause warts in different parts of the body.

HPV can be passed from one person to another during skin-to-skin contact. One way HPV is spread is through sex, including vaginal and anal intercourse and even oral sex.

HPV types are given numbers. The type linked to throat cancer (including cancer of the hypopharynx) is HPV16.

Most people with HPV infections of the mouth and throat have no symptoms, and only a very small percentage develop throat cancer. HPV infection of the mouth and throat is more common in men than in women. The risk of this infection is linked to certain sexual behaviors, such as open mouth kissing and (in some studies) oral-genital contact (oral sex). The risk also increases with the number of sexual partners a person has and with. Smoking also increases the risk of oral HPV infection. At this time, there is no test for HPV infection of the mouth and throat that is approved by the US Food and Drug Administration.

HPV infection of the throat seems to be a factor in some throat cancers, such as some cancers of the tonsils and some cancers of the hypopharynx. HPV infection is very rarely a factor in laryngeal cancer.

Get more information in our document *HPV and HPV Testing*.

Genetic syndromes

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

Fanconi anemia: This condition 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: This genetic syndrome 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 when they are young.

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 found a possible link between asbestos exposure and 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. But in recent years, 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 develop over many years, so they are not common in young people. Over half of patients with these cancers are 65 or older 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. Studies are being done to see if it increases the risk of laryngeal and hypopharyngeal cancers.

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 the 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. But DNA affects more than how we look. Some genes have instructions for controlling when cells grow and divide into new cells. Genes that help cells grow and divide 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 gene mutations are not believed to cause very many cancers of the larynx or hypopharynx.

Gene changes related to these cancers usually happen during life, rather than being inherited. These *acquired* mutations often result from exposure to cancer-causing chemicals, like those found in tobacco smoke. Acquired changes in genes such as the *TP53* and *p16* tumor suppressor genes seem to be important in laryngeal and hypopharyngeal 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. 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.

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-linked throat cancers are less likely to have used tobacco and alcohol heavily. The outlook for people with these cancers appears to be better than for people whose cancers are the result of tobacco or alcohol use.

Can laryngeal and hypopharyngeal cancers be prevented?

Not all laryngeal and hypopharyngeal cancers can be prevented, but the risk of developing these cancers can be greatly reduced by avoiding certain risk factors such as smoking and alcohol use.

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

For people who work with chemicals linked to these cancers, having plenty of workplace ventilation and using industrial respirators are important protective 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. See the *American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention* for our full guidelines.

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.

Avoid HPV infection

The risk of HPV infection of the throat is increased in those who have oral sex and multiple sex partners. Smokers are more susceptible to HPV infections, probably because the smoke damages their immune system or the cells that line the throat. These infections are common and rarely cause symptoms. Although HPV infection is linked to some cases of cancer of the larynx or hypopharynx, most people with HPV infections of the throat do not go on to develop this cancer. In addition, most cancers of the larynx and hypopharynx are not related to HPV infection.

In recent years, vaccines that reduce the risk of infection with certain types of HPV have become available. These vaccines were originally meant to lower the risk of cervical cancer, but they have been shown to lower the risk of other cancers linked to HPV as well, such as cancers of the anus, vulva, and vagina. HPV vaccination may also lower the risk of throat cancers, but this has not yet been proven.

Since these vaccines are only effective if given before someone is infected with HPV, they are given at an early age, before a person is likely to become sexually active.

Get more information in our document *HPV Vaccines*.

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 “Signs and symptoms of laryngeal and hypopharyngeal cancers” 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 it can be treated, if needed.

Signs and symptoms of laryngeal and hypopharyngeal cancers

In most cases, laryngeal and hypopharyngeal cancers are found because of the symptoms they cause.

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 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 person 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 voice changes, 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)

Many of these symptoms are more likely to be caused by conditions other than laryngeal or hypopharyngeal cancer. 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.

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).

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 exams or tests.

Medical history and physical exam

Your doctor will ask you about your symptoms, possible risk factors, family history, and other medical conditions. A thorough physical exam can help find 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.

Examination by a specialist

If your doctor suspects a cancer of the larynx or hypopharynx, you will be referred to an ear, nose, and throat (ENT) doctor, also known as an *otolaryngologist*, who will do a more thorough exam of the head and neck area. This will include an exam of the larynx and hypopharynx, known as *laryngoscopy*, which 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 also 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). 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. The doctor may also use an endoscope 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 have spread to surrounding areas. The doctor might also remove (biopsy) small tissue samples from any tumors or other abnormal areas using 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. There are different types of biopsies.

See Testing Biopsy and Cytology Specimens for Cancer to learn more about different types of biopsies, how the tissue is used in the lab for disease diagnosis, and what the results will tell you.

Endoscopic biopsy

The larynx and hypopharynx are deep inside the neck, so removing samples for biopsy can be complex. Biopsies of these areas 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

This type of biopsy is not used to remove samples in the larynx or hypopharynx, but it may be done to find the cause of an enlarged lymph node in the neck. A thin, hollow needle is placed through the skin into a mass (or tumor) to get cells for a biopsy. The cells are then looked at under a microscope. 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 cancer cells look like they might have come from 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 might

be from a laryngeal or hypopharyngeal cancer, you could 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 person 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 cancer has been treated by surgery and/or radiation therapy, to help find out if a 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, 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.

A CT scanner has been described as a large donut, with a narrow table in the middle opening. You will need to lie still on the table while the scan is being done. CT scans take longer than regular x-rays, and you might feel a bit confined by the ring while the pictures are being taken.

You may be asked to drink 1 to 2 pints of a liquid called *oral contrast* before the test. 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.

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 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, so some centers provide earplugs to help block this noise out.

Barium swallow

This is often the first test done if someone is having a problem with swallowing. For this test, you drink 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 you swallow. The barium can help show abnormal areas in the throat.

Chest x-ray

A chest x-ray may be done to see if the cancer has spread to the lungs. If any suspicious spots are seen 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 grow quickly, 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 can also be used to help tell if a suspicious area seen on another imaging test is cancer or not.

Some newer machines can do 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 in people 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 are often done to check liver and kidney function, as well as to help evaluate your overall health before 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 a person's outlook (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 the stage can help 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 sum up the extent of a cancer's spread. The most common system used to describe cancer stages 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. (Cancers often first spread to lymph nodes, which are bean-sized collections of immune system cells.)

- **M** is for **metastasis** (spread to distant organs). These cancers most often 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 describes how far the cancer has spread within the larynx or hypopharynx and to any nearby 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 mean more advanced spread.

The T group of laryngeal cancer also depends on the movement of the vocal cords. The doctor will watch the vocal cords with an endoscope or special mirrors while the person makes certain sounds. If the vocal cords move normally, the cancer probably has not affected deeper tissues. If a vocal cord isn't moving normally (vocal cord fixation) it can be because cancer is growing into it.

The features used to assign the T group of laryngeal cancer are 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 inner lining 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 the cancer has reached 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

Vocal cord movement 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 in 1 subsite of the supraglottis.

T2: The tumor is in 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 only in the larynx but has caused a 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 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 space between the lungs. This is also known as *very advanced local disease*.

T groups for glottic cancer

These cancers start in the glottis – the part of the larynx that includes the vocal cords.

T1: The tumor is 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 only in the larynx but has caused a vocal cord to stop moving.
- The tumor is growing into the paraglottic space.
- The tumor is growing into the inner part of 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 space between the lungs. This is also known as *very advanced local disease*.

T groups for subglottic cancer

These cancers start in the subglottis – the part of the larynx below the vocal cords.

T1: The tumor is only 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 but has caused a vocal cord to stop moving.

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 space between the lungs. 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:

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

T1: The tumor is only in 1 subsite of the hypopharynx and it is 2 centimeters (cm) (about ¾ of an inch) across or smaller.

T2: One or more of the following applies:

- The tumor in in 2 or more subsites of the hypopharynx.
- The tumor is in 1 subsite plus an area nearby.
- The tumor is more than 2 cm but not more than 4 cm (about 1½ inches) across, and the vocal cords move normally.

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 or fat 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, surrounds a carotid artery, or is growing down into the space between the lungs. 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 the cancer has 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 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 cancers 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 cancers, stop reading here and skip to the next section.

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 better outlook for people now being diagnosed with these cancers.

The rates below are based on the stage of the cancer *at the time of diagnosis*. When looking at survival rates, it's important to understand that the stage of a cancer does not change over time, even if the cancer progresses. A cancer that comes back or spreads is still referred to by the stage it was given when it was first found and diagnosed, but more information is added to explain the current extent of the cancer. (And of course, the treatment plan is adjusted based on the change in cancer status.)

These numbers are from the National Cancer Data Base, based on patients diagnosed in 1998-1999, and published in 2010 in the *AJCC Cancer Staging Manual, Seventh Edition* (see the "References: Laryngeal and hypopharyngeal cancer detailed guide" section). For laryngeal cancers, survival rates differ based on which part of the larynx the cancer started in (supraglottis, glottis, or subglottis).

Supraglottis (part of the larynx above the vocal cords)

Stage	5-year relative survival rate
I	59%
II	59%
III	53%
IV	34%

Glottis (part of the larynx including the vocal cords)

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

Subglottis (part of the larynx below the vocal cords)

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

Stage	5-year relative survival rate
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 based on previous outcomes of large numbers of people who had the disease, but they cannot predict what will happen in any person's case. Many other factors can 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 apply to you, as he or she is familiar with your 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

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

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

Treatment for laryngeal or hypopharyngeal cancer may include:

- Surgery
- Radiation therapy
- Chemotherapy
- Targeted therapy

Depending on the stage of the cancer and your overall health, different treatment options may be used alone or in combination. Based on these options, you might have different types of doctors on your treatment team. These doctors can 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 could be involved in your care as well, including physician assistants, nurse practitioners, nurses, nutrition specialists, speech therapists, 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. It's also very important to ask questions if there is anything you're not sure about. You can find some good questions to ask in the section "What should you ask your doctor about laryngeal or hypopharyngeal cancer?"

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 the treatment plan you choose.

A major consideration in all treatments is to try to save your larynx and voice whenever possible. 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.

No matter which type of treatment you get, it is important for you to understand the goals of treatment beforehand. Be sure to discuss this with your doctor so you will have an idea of what to expect.

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 and location of the cancer, different operations may be used to remove the cancer and some nearby parts of the larynx or hypopharynx.

After the cancer is removed, reconstructive surgery may be done to help restore the appearance and function of the affected areas.

Vocal cord stripping

In this technique, the doctor 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 larynx cancers. An endoscope is passed down your 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 vaporization is that 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 a hoarse voice.

Cordectomy

For a cordectomy the surgeon removes all or part of your vocal cords. This can be used to treat very small or superficial glottic (vocal cord) cancers. The effect of this procedure on speech depends on how much of the vocal cords are removed. Removing part of a vocal cord may result in hoarseness. 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).

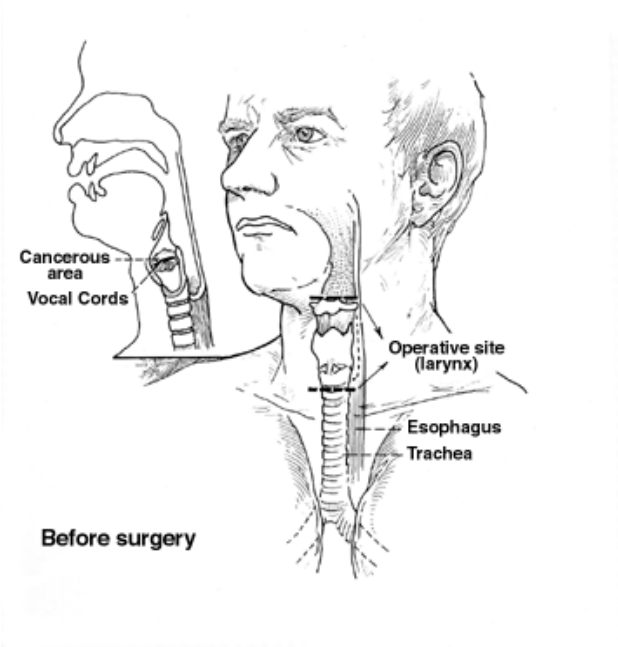
Partial laryngectomy: Smaller cancers of the larynx often can be treated by removing only part of the voice box. There are different types of partial laryngectomies, but they all have the same goal: to remove the entire cancer while leaving behind as much of the larynx as possible.

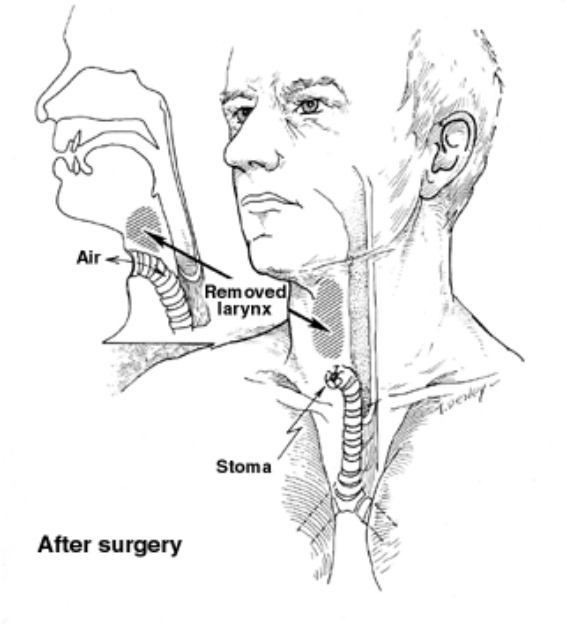
In a *supraglottic laryngectomy*, only the portion of your larynx above the vocal cords is removed. This procedure can be used to treat some supraglottic cancers, and will allow you to speak normally afterward.

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 operation, known as a *hemilaryngectomy*, will allow some speech to remain.

Total laryngectomy: In this procedure, your entire larynx 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 picture below). This is known as a *tracheostomy*. Once the entire larynx is removed, you can no longer speak normally, but you can learn other ways 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, you can swallow food and liquids just as you did before the operation.





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Total or partial pharyngectomy

Surgery to remove all or part of the pharynx (throat) 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 surgery

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 part of your throat.

Free flaps: With the advances in 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 your doctor thinks that lymph node spread is likely, lymph nodes (and other nearby tissues) may be removed from your neck. This operation, called a *neck dissection*, is done at the same time as the surgery to remove the main tumor. Doctors determine how likely the cancer has spread to the lymph nodes based on the size and location of the tumor and whether or not the lymph nodes are enlarged on an imaging test.

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

Tracheostomy/tracheotomy

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

After a partial laryngectomy or pharyngectomy, a temporary tracheostomy (using a small plastic tube known as a *trach tube*) may be put in place to help protect your airway while you recover from surgery. The tube stays in place for a short time, and is then removed later when it is no longer needed.

As described above, a permanent tracheostomy is needed after a total laryngectomy. In this procedure, the opening in the trachea is connected to a hole in the skin in the front of the neck. A trach tube or stoma cover may be needed to help keep the tracheostomy open.

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 your windpipe to a stoma (hole) in the front of your neck to bypass the tumor and allow you to breathe more comfortably.

Gastrostomy tube

Cancers in the larynx and hypopharynx may keep 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. The tube is often put in place with the help of a flexible, lighted instrument (endoscope) passed down your mouth and into the stomach. This is done while you are sedated. When it is placed through endoscopy, it is called a *percutaneous endoscopic gastrostomy*, or *PEG tube*. Another option is to put the tube in place during an operation. Once in place, the tube can deliver nutrition directly into the stomach.

Often, the gastrostomy tube is only needed for a short time to help you get enough nutrition during radiation and/or chemotherapy. The tube can be removed once your swallowing improves after treatment. It is important to keep swallowing even when getting most of your nutrition through a G tube to keep those muscles active and increase the likelihood that you will return to normal swallowing after treatment is complete.

Possible risks and side effects of surgery

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

Patients who have a laryngectomy or pharyngectomy typically lose the ability to speak normally. Less extensive operations can also affect speech in some cases (see “What happens after treatment for laryngeal and hypopharyngeal cancers?” for more about speech after surgery).

Some people will need a tracheostomy after surgery (see “What happens after treatment for laryngeal and hypopharyngeal cancers?” for information on tracheostomy care).

Surgeries that affect 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, you might need a tracheostomy.

Throat or larynx surgeries may also sometimes affect your ability to swallow. This can affect how you eat, and might be severe enough to require a permanent feeding tube in some cases.

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.

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 heartbeat. These problems can be treated with medicines.

For more general information on surgery as a treatment for cancer, see our document *Understanding Cancer Surgery: A Guide for Patients and Families*.

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.

- It can be used as the main (primary) treatment for some early stage 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.
- It can be used to treat some patients whose 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*.
- It can be used to ease symptoms of advanced laryngeal and hypopharyngeal cancer such as pain, bleeding, trouble swallowing, and problems caused when cancer spreads 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 section about chemotherapy for more details.)

Types of radiation therapy

There are 2 main types of radiation therapy.

External beam radiation therapy

This is 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 much 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.

Smoking during radiation treatment is linked to worse outcomes, so you should stop smoking completely before starting treatment. Smoking also increases the risk of the cancer coming back after treatment as well as the risk of getting another cancer, so quitting smoking for good is the best effective strategy to improve survival.

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 also been studied:

- *Hyperfractionation* means 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.

Modern techniques help doctors focus the radiation more precisely.

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 limit the dose reaching the most sensitive nearby normal tissues. This may let the doctor deliver a higher dose to the tumor. This is the most common way radiation is given for laryngeal and hypopharyngeal cancer.

Brachytherapy

Internal radiation therapy, also known as brachytherapy, uses radioactive material placed directly into or near the cancer. Brachytherapy may be used alone or combined 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 painful sores in the mouth and throat that can make eating and drinking very hard. This can lead to weight loss and malnutrition. The sores heal with time after the radiation has stopped, but some people continue to have problems swallowing long after treatment ends.

Other side effects of radiation therapy may include:

- Skin problems in the area being treated, ranging from redness to blistering and peeling
- Dry mouth
- 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 affect your teeth, which could worsen any existing dental problems. Depending on the 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 the head and neck might damage the salivary glands, 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 treated with radiation to the neck and throat must pay close attention to their oral health.

When radiation is used as the main treatment for cancer of the larynx, it could 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 about radiation therapy, see the “Radiation Therapy” section of our website, or 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 useful for cancers that have spread beyond where they started.

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*.
- It is 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

Treatment may involve the use of a single drug or 2 or more in combination. Common combinations include cisplatin with 5-FU and cisplatin, docetaxel, and 5-FU. Sometimes chemo is combined with the targeted drug cetuximab.

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

Chemoradiation

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

- 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 common regimen is to give a dose of cisplatin every 3 weeks (for a total of 3 doses) during radiation. In patients who cannot tolerate chemoradiation, the targeted drug cetuximab is often used with radiation instead.

Possible side effects of chemotherapy

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 can also 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
- Mouth sores
- Diarrhea
- Hair loss
- 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 chemo drugs can cause other side effects. For example, cisplatin, docetaxel, and paclitaxel can cause nerve damage (called *neuropathy*), which can lead to numbness, tingling, or even pain in the hands and feet. The nerve damage caused by cisplatin can also cause hearing loss. This often improves once treatment is stopped, but it can last a long time in some people.

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, 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 drugs can help prevent or treat nausea and vomiting.

For more information on chemotherapy, see the "Chemotherapy" section of our website, or our document *A Guide to Chemotherapy*.

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 may work in some cases when chemotherapy doesn't. They also tend to have different (and less severe) side effects.

Cetuximab (Erbitux®) 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 will 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 might include headache, tiredness, fever, nausea, and diarrhea.

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

For more information about targeted therapy see our document *Targeted Therapy*.

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 website at 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 website at 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*.

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 websites 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 or see the "Complementary and Alternative Medicine" section of our website 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 your 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. They are 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 people 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 people with stage I and II laryngeal cancers can be treated successfully without totally removing their larynx.

Either radiation alone (without surgery) or partial laryngectomy can be used in most people. Voice results tend to be better with radiation therapy than with partial laryngectomy, and the complication rate tends to be lower for radiation treatment. 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.

Some early glottic cancers may be treated by removing the cancerous vocal cord, or even by laser surgery. Radiation or surgery is usually enough to treat most glottic cancers unless there are signs that the treatment might not have cured the cancer (such as finding cancer cells at the edge of the surgery specimen). If you need further treatment after surgery, your options might include radiation therapy, chemoradiation, or more extensive 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 probably remove lymph nodes from your neck. If your treatment is radiation therapy alone, you will also get radiation to the lymph nodes in the neck. If, after surgery, the cancer is found to have features that make it more likely to come back, further treatment such as radiation therapy, chemoradiation, or more extensive surgery may be recommended.

Stage III and IV laryngeal cancers

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

The main options for initial treatment are surgery or chemotherapy with radiation. Radiation therapy alone (or with the targeted drug cetuximab/Erbitux) may be an option for people who cannot tolerate more intensive treatments.

Surgery for these tumors is almost always complete removal of the larynx (total laryngectomy), but a small portion of these 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 done. Radiation therapy, often given with chemo, may be needed 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 chemoradiation (radiation and chemotherapy given together). If any cancer remains after treatment, surgery can then be done to try to remove it. This treatment can be hard to take, but it works as well as total laryngectomy in treating the cancer, while giving 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, the best treatment approach may be surgery to remove the larynx.

Another option may be to start with chemotherapy alone, which also is known as *induction chemotherapy*. If the tumor shrinks, radiation therapy or chemoradiation 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 or the targeted drug cetuximab (Erbitux). 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 is often 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 already at an advanced stage when they are diagnosed. 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 often recommended.

Stage I hypopharyngeal cancers

The main options for initial treatment of these cancers are surgery and/or radiation.

Surgery includes removing all or part of the pharynx (throat) as well as lymph nodes on both sides of the neck. The larynx often needs to be removed as well. People who have a high chance of the cancer returning (based on what is found during surgery) may then be treated with radiation or chemotherapy combined with radiation (chemoradiation).

Some patients with small tumors may get radiation as their main treatment. The cancer is assessed again after the treatment is complete and if there is any cancer remaining, surgery is done.

Stages II, III, and IV hypopharyngeal cancers

There are 3 main options to treat these cancers.

The first is surgery to remove the pharynx, larynx, and lymph nodes in the neck. This is usually followed by radiation alone or radiation with chemo, especially if there is a high chance of the cancer returning (based on what is found during surgery).

Another option is to be treated first with both radiation and the chemo drug cisplatin (chemoradiation). If any cancer remains after treatment, surgery can then be done to try to remove it.

The third option is to get chemotherapy as the first treatment, also known as *induction chemotherapy*. This is usually followed by radiation therapy or chemoradiation, depending on how much the tumor shrinks. If the tumor does not shrink, surgery might be done. If the lymph nodes in the neck remain enlarged after treatment, they can 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 chemo or cetuximab. 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 is often 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 come backs 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 recurrences in people who have already had limited surgery such as partial laryngectomy can often 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. Radiation in these cases is generally delivered by external beam. However, a special way of giving external beam radiation called stereotactic radiosurgery is also being studied. This approach gives high doses of radiation over just a few sessions (instead of weeks). Not all facilities have the expertise to be able to deliver stereotactic radiosurgery.

For distant recurrences and for local recurrences that have not responded to radiation therapy and surgery, the main treatment is chemotherapy and/or targeted therapy, sometimes along with radiation, 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 about laryngeal and hypopharyngeal cancers

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 website (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 website (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.

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 where it started?
- What is the stage of my cancer, and what does that mean?
- 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?

Along with 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 might 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 might 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. Our document *When Cancer Doesn't Go Away* talks more about this.

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.

When these cancers recur, it is most often in the first couple of 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 or so after treatment. Follow-up may then be spread out to longer 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 you develop new symptoms.

If you were treated with radiation and it reached your thyroid gland, you may need regular blood tests to check your thyroid function. People treated with radiation may also have problems with dry mouth and tooth decay, so your doctor may also recommend dental exams. Both radiation and surgery can lead to problems with speech and swallowing. These are often evaluated and treated by a speech therapist.

Almost any cancer treatment can have side effects. Some last for a few weeks to 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 help your doctor 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 cancer recurrence, see our document *When Your Cancer Comes Back: Cancer Recurrence*.

Restoring speech after total laryngectomy

After a total laryngectomy, you will not be able to speak using your vocal cords. However, there are ways to restore 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 people learn to swallow air and force it through their mouth. As the air passes through the throat it will cause vibrations which, with training, can be turned 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. (Some newer “hands-free” models do not require you to cover the stoma to speak.) 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 placed in either the corner of the mouth or against the skin of the neck. When you press a button on the device, it makes 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 (see “Additional resources for laryngeal and hypopharyngeal cancer”).

Help for 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 or may need nutritional supplements to help make sure they get the nutrition they need. Some people may even need to have a feeding tube placed in the stomach for a short time after treatment.

A team of doctors and nutritionists can work with you to help you manage your individual nutritional needs. This can help you maintain your weight and get the nutrients you need.

Sexual impact of laryngectomy

Laryngectomy, with the resulting tracheostomy (stoma), can change your appearance as well as your speech and breathing. Sexual intimacy may be affected by these changes, but there are things you can do that can help during intimacy. This topic is covered in detail in our documents *Sexuality for the Man With Cancer* and *Sexuality for the Woman With Cancer*.

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. Gathering these details soon after treatment may be easier than trying to get them at some point in the future. 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 stayed 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 or targeted therapy, 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 after laryngeal or hypopharyngeal cancer

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 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 at 1-800-227-2345. A 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. This is especially true for cancers of the head and neck, such as laryngeal or hypopharyngeal cancer. The cancer or its treatment may affect how you swallow or cause dry mouth, loss of teeth, changes in taste, or other problems. Nausea can be a problem from some treatments. You may not feel like eating and lose weight when you don't want to.

If treatment causes 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.

You can get more information in our document *Nutrition and Physical Activity During and After Cancer Treatment: Answers to Common Questions*.

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 be active 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's 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 and other treatment side effects, please see the "Physical Side Effects" section of our website or "Additional resources for laryngeal and hypopharyngeal cancer" to get a list of available information.

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 can be helpful. If you smoke, it is very important to quit. Quitting improves the chances of successful treatment, lowers the chance of the cancer coming back, and 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 does having laryngeal or hypopharyngeal cancer affect your emotional health?

During and after treatment, you might 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 might be stressed by financial concerns resulting from your treatment. You might also 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. You can also read our document *Distress in People with Cancer* or see the "Emotional Side Effects" section of our website for more information.

If treatment for laryngeal or hypopharyngeal cancer 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 cancer 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, it 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 goal 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 an airway. But this is not the same as treatment to try to cure the cancer.

You can learn more about the changes that occur when curative treatment stops working, and about planning ahead for yourself and your family, in our documents *Nearing the End of Life* and *Advance Directives*.

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 cancers 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 around the world.

Gene changes in laryngeal and hypopharyngeal cancers

A great deal of research is being done to learn how changes in certain genes cause cells in the larynx or hypopharynx to become cancerous.

The *TP53* tumor suppressor gene is often altered in these cancers. Changes in this gene play a role in many head and neck cancers. Tests to detect *TP53* gene changes may someday help find laryngeal and hypopharyngeal cancers early. These tests may also be used to better define surgical margins (check to see if all cancer cells have been removed) and to tell 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 of have been found in cancers of the larynx or hypopharynx. These include the *p16*, *NOTCH1*, and *cyclin D1* genes. Researchers hope this information might lead to better tests for early detection and to 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 studied for this purpose, but the results so far have been disappointing.

Treatment

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*. In this approach, the surgeon operates by precisely moving robotic arms holding long surgical tools that are passed down the throat. This technique uses 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.

A newer 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, at least in theory, 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. 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 how well they work. Newer chemotherapy drugs are also being tested.

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

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 (Erbitux), an antibody that blocks EGFR, is sometimes used to treat cancers of larynx and hypopharynx. Other EGFR blockers are under study for use in 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 helped treat other cancers, and 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 cancers

More information from your American Cancer Society

Here is more information you might find helpful. You also can order free copies of our documents from our toll-free number, 1-800-227-2345, or read them on our website, www.cancer.org.

Dealing with diagnosis and treatment

Health Professionals Associated With Cancer Care

Talking With Your Doctor (also in Spanish)

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

Nutrition for the Person With Cancer During Treatment: A Guide for Patients and Families (also in Spanish)

Coping With Cancer in Everyday Life (also in Spanish)

Family and caregiver concerns

Talking With Friends and Relatives About Your Cancer (also in Spanish)

Helping Children When A Family Member Has Cancer: Dealing With Diagnosis (also in Spanish)

What It Takes to Be a Caregiver

Insurance and financial issues

In Treatment: Financial Guidance for Cancer Survivors and Their Families (also in Spanish)

Health Insurance and Financial Assistance for the Cancer Patient (also in Spanish)

More on cancer treatments

Understanding Cancer Surgery: A Guide for Patients and Families (also in Spanish)

A Guide to Chemotherapy (also in Spanish)

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

Targeted Therapy

Cancer treatment side effects

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

Distress in People With Cancer

Anxiety, Fear, and Depression

Nausea and Vomiting

Guide to Controlling Cancer Pain (also in Spanish)

Get Relief From Cancer Pain

Pain Diary

Anemia in People With Cancer

Fatigue in People With Cancer

Your American Cancer Society also has books that you might find helpful. Call us at 1-800-227-2345 or visit our bookstore online at cancer.org/bookstore to find out about costs or to place an order.

National organizations and websites*

Along with the American Cancer Society, other sources of information and support include:

International Association of Laryngectomees (IAL)
Toll-free number: 1-866-425-3678 (1-866-IAL-FORU)
Website: www.theial.com

Programs and services include: Skills education for laryngectomees; a directory of vendors for laryngectomy supplies, including communication devices, stoma covers, “neck breather’ bracelets and more; laryngectomee clubs in over 11 countries (internet clubs also available); a registry of alaryngeal (post-laryngectomy) speech instructors; the Voice Rehabilitation Institute which trains laryngectomees and therapists; as well as newsletters and educational materials

Let’s Face It
Website**:** http://www.dent.umich.edu/faceit

A free online resource about, by, and for people with facial differences, including facial disfigurement as a result of cancer; offers information on dealing with diagnosis, finding a good doctor, health insurance, research articles, and lifestyle tips

National Cancer Institute (NCI)
Toll-free number: 1-800-422-6237 (1-800-4-CANCER)
TYY: 1-800-332-8615
Website: www.cancer.gov

Their “Cancer Information Service” offers a wide variety of free, accurate, up-to-date information about cancer to patients, their families, and the general public; also can help people find clinical trials in their area

National Coalition for Cancer Survivorship (NCCS)
Toll-free number: 1-888-650-9127
Website: www.canceradvocacy.org

Call 1-877-NCCS-YES (622-7937) for publications on many topics and Cancer Survivor Toolbox® orders. The Cancer Survival Toolbox is a free program that teaches skills that can help people with cancer meet the challenges of their illness.

Support for People with Oral and Head and Neck Cancer, Inc. (SPOHNC)
Toll-free number: 1-800-377-0928
Website: www.spohnc.org

Offers free telephone support for survivors and their families, as well as resources and referrals on all aspects of oral and head and neck cancer; also has a “survivor-to-survivor network;” and resource and product information, including a free resource guide called “We Have Walked in Your Shoes”

WebWhispers Nu-Voice Club
Website: www.webwhispers.org

A free internet-based laryngectomee resource for those who have questions about larynx cancer treatments, surgery, recovery, and what life is like after a laryngectomy. Offers an information library -- covering topics as varied as larynx cancer treatment, talking again, stoma care, activities of daily living, and caregiving ; a complete listing of laryngectomee suppliers; the WebWhispers Forum – an online community; a loan closet that provides temporary use of an

electrolarynx (EL) for member trials or for those whose units are being repaired; and more

**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.

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For additional assistance please contact your American Cancer Society
1-800-227-2345 or www.cancer.org