Esophagus Cancer

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 way. 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. In most cases the cancer cells form a tumor. 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 is 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 abnormal cell does.

People can inherit damaged DNA, but most often the 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.

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 named (and treated) based on the place where it started. For example, breast cancer that has spread to the liver is still 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. 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 can't 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.

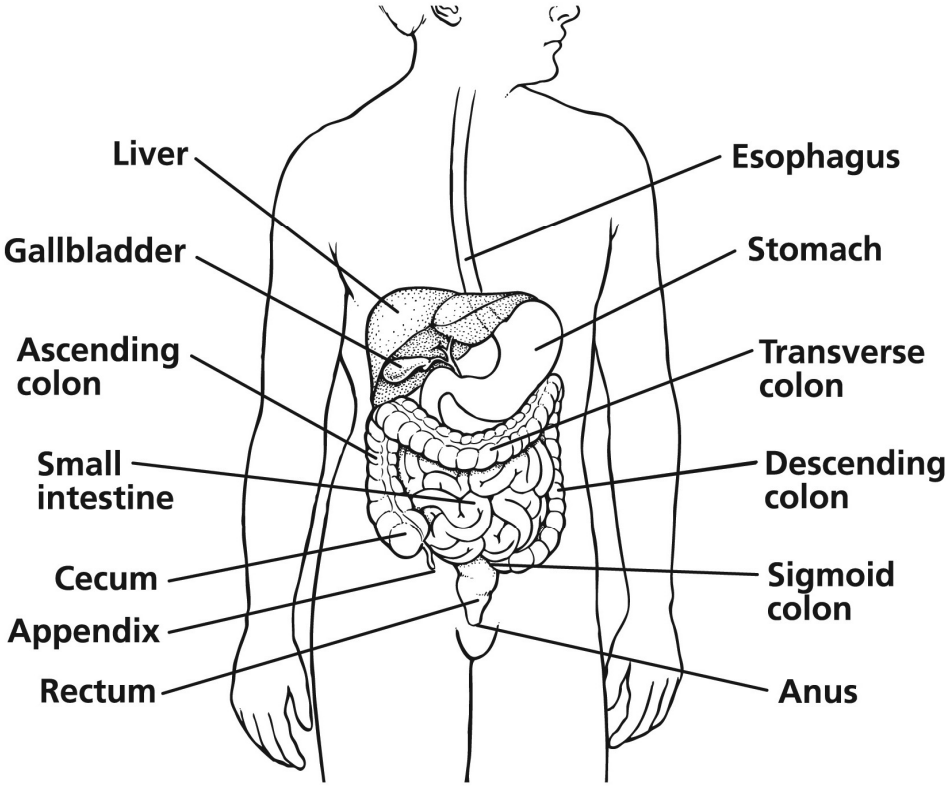
What is cancer of the esophagus?

To understand esophagus cancer, it helps to know about the normal structure and function of the esophagus.

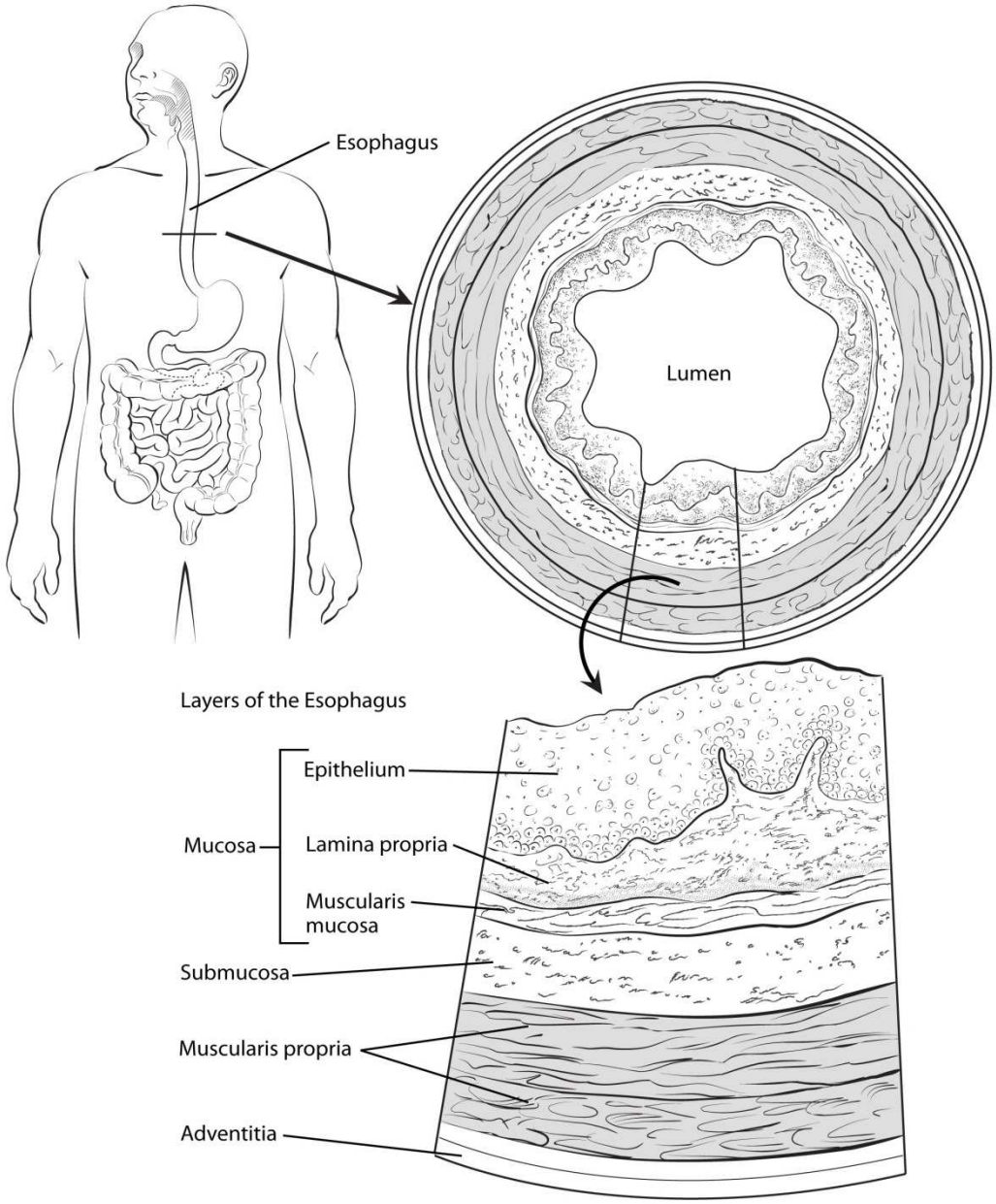
The esophagus

The esophagus is a hollow, muscular tube that connects the throat to the stomach. It lies behind the trachea (windpipe) and in front of the spine.

Food and liquids that are swallowed travel through the inside of the esophagus (called the *lumen*) to reach the stomach. In adults, the esophagus is usually between 10 and 13 inches long and is about ¾ of an inch across at its smallest point.



The wall of the esophagus has several layers. These layers are important for understanding where cancers in the esophagus tend to start and how they can grow.



Mucosa: This layer lines the inside of the esophagus. The mucosa has 3 parts:

- The *epithelium* forms the innermost lining of the esophagus and is normally made up of flat, thin cells called *squamous cells*. This is where most cancers of the esophagus start.
- The *lamina propria* is a thin layer of connective tissue right under the epithelium.
- The *muscularis mucosa* is a very thin layer of muscle under the lamina propria.

Submucosa: This is a layer of connective tissue just below the mucosa that contains blood vessels and nerves. In some parts of the esophagus, this layer also includes glands that secrete mucus.

Muscularis propria: This is a thick layer of muscle under the submucosa. It contracts in a coordinated, rhythmic way to push food along the esophagus from the throat to the stomach.

Adventitia: This is the outermost layer of the esophagus, which is formed by connective tissue.

The upper part of the esophagus has a special area of muscle at its beginning that relaxes to open the esophagus when it senses food or liquid coming toward it. This muscle is called the *upper esophageal sphincter*.

The lower part of the esophagus that connects to the stomach is called the *gastroesophageal (GE) junction*. A special area of muscle near the GE junction, called the *lower esophageal sphincter*, controls the movement of food from the esophagus into the stomach. Between meals, it closes to keep the stomach's acid and digestive enzymes out of the esophagus.

Esophageal dysplasia

Dysplasia is a pre-cancerous condition in which the cells lining the inside of the esophagus look abnormal when seen under a microscope. It is sometimes seen in people with a condition called *Barrett's esophagus*, which is described in the section "What are the risk factors for cancer of the esophagus?"

Dysplasia is graded by how abnormal the cells look under the microscope. Low-grade dysplasia looks more like normal cells, while high-grade dysplasia is more abnormal and is linked to the highest risk of cancer.

Esophageal cancer

Cancer of the esophagus (also referred to as *esophageal cancer*) starts in the inner layer (the mucosa) and grows outward (through the submucosa and the muscle layer). Since 2 types of cells can line the esophagus, there are 2 main types of esophageal cancer:

Squamous cell carcinoma

The esophagus is normally lined with squamous cells. Cancer starting in these cells is called *squamous cell carcinoma*. This type of cancer can occur anywhere along the esophagus. Once, squamous cell carcinoma was by far the more common type of esophageal cancer in the United States. This has changed over time, and now it makes up less than half of esophageal cancers in this country.

Adenocarcinoma

Cancers that start in gland cells are called *adenocarcinomas*. This type of cell is not normally part of the inner lining of the esophagus. Before an adenocarcinoma can develop, gland cells must replace an area of squamous cells, which is what happens in Barrett's esophagus. This occurs mainly in the lower esophagus, which is where most adenocarcinomas start.

Adenocarcinomas that start at the area where the esophagus joins the stomach (the GE junction, which includes about the first 2 inches of the stomach called the *cardia*), tend to behave like cancers in the esophagus (and are treated like them, as well), so they are grouped with esophagus cancers.

Rare cancers

Other types of cancer can also start in the esophagus, including lymphomas, melanomas, and sarcomas. But these cancers are rare and are not discussed further in this document.

What are the key statistics about cancer of the esophagus?

The American Cancer Society's estimates for esophageal cancer in the United States for 2015 are:

- About 16,980 new esophageal cancer cases diagnosed (13,570 in men and 3,410 in women)
- About 15,590 deaths from esophageal cancer (12,600 in men and 2,990 in women)

This disease is 3 to 4 times more common among men than among women. The lifetime risk of esophageal cancer in the United States is about 1 in 125 in men and about 1 in 435 in women. (See the next section for risk factors that can affect these chances.)

Overall, the rates of esophageal cancer in the United States have been fairly stable for many years. It was once much more common in African Americans than in whites. But it is now about equally as common, as rates have fallen in African Americans and gone up slightly in whites over the past few decades. Squamous cell carcinoma is the most common type of cancer of the esophagus among African Americans, while adenocarcinoma is more common in whites.

Esophageal cancer makes up about 1% of all cancers diagnosed in the United States, but it is much more common in some other parts of the world, such as Iran, northern China, India, and southern Africa. The main type of esophageal cancer in these areas is squamous cell carcinoma.

Although many people with esophageal cancer will go on to die from this disease, treatment has improved and survival rates are getting better. During the 1960s and 1970s, only about 5% of patients survived at least 5 years after being diagnosed. Now, about 20% of patients survive at least 5 years after diagnosis. This number includes patients with all stages of

esophageal cancer. Survival rates for people with early stage cancer are higher. For more information on survival, see the section, “Survival rates for cancer of the esophagus by stage.”

What are the risk factors for cancer of the esophagus?

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

Scientists have found several factors that affect your risk of cancer of the esophagus. Some are more likely to increase the risk for adenocarcinoma of the esophagus and others for squamous cell carcinoma of the esophagus.

But having a risk factor, or even several, does not mean that you will get the disease. Many people with risk factors never develop esophagus cancer, while others with this disease may have few or no known risk factors.

Age

The chance of getting esophageal cancer is low at younger ages and increases with age. Less than 15% of cases are found in people younger than age 55.

Gender

Men are more than 3 times as likely as women to get esophageal cancer.

Gastroesophageal reflux disease

The stomach normally makes strong acid and enzymes to help digest food. In some people, acid can escape from the stomach into the lower part of the esophagus. The medical term for this is *gastroesophageal reflux disease* (GERD), or just *reflux*. In many people, reflux causes symptoms such as heartburn or pain that seem to come from the middle of the chest. In some, though, reflux doesn’t cause any symptoms at all.

People with GERD have a slightly higher risk of getting adenocarcinoma of the esophagus. This risk seems to be higher in people who have more frequent symptoms. But GERD is very common, and the vast majority of people who have it *do not* go on to develop esophageal cancer. GERD can also cause Barrett’s esophagus, which is linked to an even higher risk (discussed below).

Barrett's esophagus

If reflux of stomach acid into the lower esophagus goes on for a long time, it can damage the inner lining of the esophagus. This causes the squamous cells that normally line the esophagus to be replaced with gland cells. These gland cells usually look like the cells that line the stomach and the small intestine, and are more resistant to stomach acid. This condition is known as Barrett's (or Barrett) esophagus.

The longer someone has reflux, the more likely it is that they will develop Barrett's esophagus. Most people with Barrett's esophagus have had symptoms of heartburn, but many have no symptoms at all.

The gland cells in Barrett's esophagus can become more abnormal over time. This can result in *dysplasia*, a pre-cancerous condition. Dysplasia is graded by how abnormal the cells look under the microscope. Low-grade dysplasia looks more like normal cells, while high-grade dysplasia is more abnormal and is linked to the highest risk of cancer.

People with Barrett's esophagus are much more likely than people without this condition to develop adenocarcinoma of the esophagus. Still, most people with Barrett's esophagus do not get esophageal cancer. The risk of cancer is highest if dysplasia is present or if other people in your family also have or have had Barrett's.

Tobacco and alcohol

The use of tobacco products, including cigarettes, cigars, pipes, and chewing tobacco, is a major risk factor for esophageal cancer. The more a person uses tobacco and the longer it is used, the higher the cancer risk. Someone who smokes a pack of cigarettes a day or more has at least twice the chance of getting adenocarcinoma of the esophagus than a nonsmoker. The link to squamous cell esophageal cancer is even stronger. The risk of esophageal cancer goes down if tobacco use stops.

Drinking alcohol also increases the risk of esophageal cancer. The chance of getting esophageal cancer goes up with more consumption of alcohol. Alcohol affects the risk of the squamous cell type more than the risk of adenocarcinoma.

Combining smoking and drinking alcohol raises the risk of esophageal cancer much more than using either alone.

Obesity

People who are overweight or obese (very overweight) have a higher chance of getting adenocarcinoma of the esophagus. This is in part explained by the fact that people who are obese are more likely to have esophageal reflux.

Diet

Certain substances in the diet may increase esophageal cancer risk. For example, there have been suggestions, as yet not well proven, that a diet high in processed meat may increase the chance of developing esophageal cancer. This may help explain the high rate of this cancer in certain parts of the world.

On the other hand, a diet high in fruits and vegetables is linked to a lower risk of esophageal cancer. The exact reasons for this are not clear, but fruits and vegetables have a number of vitamins and minerals that may help prevent cancer.

Drinking very hot liquids frequently may increase the risk for the squamous cell type of esophageal cancer. This might be the result of long-term damage the liquids do to the cells lining the esophagus.

Overeating, which leads to obesity, increases the risk of the adenocarcinoma of the esophagus.

Achalasia

In this condition, the muscle at the lower end of the esophagus (the lower esophageal sphincter) does not relax properly. Food and liquid that are swallowed have trouble passing into the stomach and tend to collect in the esophagus, which becomes stretched out (dilated) over time. The cells lining the esophagus can become irritated from being exposed to foods for longer than normal amounts of time.

People with achalasia have a risk of esophageal cancer that is many times normal. On average, the cancers are found about 15 to 20 years after the achalasia is diagnosed.

Tylosis

This is a rare, inherited disease that causes excess growth of the top layer of skin on the palms of the hands and soles of the feet. People with this condition also develop small growths (papillomas) in the esophagus and have a very high risk of getting squamous cell cancer of the esophagus.

People with tylosis need to be watched closely to try to find esophageal cancer early. Often this requires regular monitoring with an upper endoscopy (described in “How is cancer of the esophagus diagnosed?”).

Plummer-Vinson syndrome

People with this rare syndrome have webs in the upper part of the esophagus, typically along with anemia (low red blood cell counts) due to low iron levels, tongue irritation (glossitis),

brittle fingernails, and sometimes a large thyroid gland or spleen. Another name for this is *Paterson-Kelly syndrome*.

A web is a thin membrane extending out from the inner lining of the esophagus that causes an area of narrowing. Most esophageal webs do not cause any problems, but larger ones can cause food to get stuck in the esophagus, which can lead to problems swallowing.

About 1 in 10 patients with this syndrome eventually develop squamous cell cancer of the esophagus or cancer in the lower part of the throat (hypopharynx).

Workplace exposures

Exposure to chemical fumes in certain workplaces may lead to an increased risk of esophageal cancer. For example, exposure to some of the solvents used for dry cleaning might lead to a greater risk of esophageal cancer. Some studies have found that dry cleaning workers may have a higher rate of esophageal cancer, but not all studies have found this link.

Injury to the esophagus

Lye is a chemical found in strong industrial and household cleaners such as drain cleaners. Lye is a corrosive agent that can burn and destroy cells. Accidentally drinking from a lye-based cleaner bottle can cause a severe chemical burn in the esophagus. As the injury heals, the scar tissue can cause an area of the esophagus to become very narrow (called a *stricture*). People with these strictures have an increased risk of squamous cell esophageal cancer, which often occurs many years (even decades) later.

History of certain other cancers

People who have had certain other cancers, such as lung cancer, mouth cancer, and throat cancer have a high risk of getting squamous cell carcinoma of the esophagus as well. This may be because all of these cancers can be caused by smoking.

Human papilloma virus (HPV) infection

HPV is a group of more than 100 related viruses. They are called papilloma viruses because some of them cause a type of growth called a papilloma (or wart). Infection with certain types of HPV is linked to a number of cancers, including throat cancer, anal cancer, and cervical cancer.

Signs of HPV infection have been found in up to one-third of esophagus cancers from patients in parts of Asia and South Africa. But signs of HPV infection have not been found in esophagus cancers from patients in the other areas, including the US.

Do we know what causes cancer of the esophagus?

We do not yet know exactly what causes most esophageal cancers. However, there are certain risk factors that make getting esophageal cancer more likely (see the section, “What are the risk factors for cancer of the esophagus?”).

Scientists believe that some risk factors, such as the use of tobacco or alcohol, may cause esophageal cancer by damaging the DNA in cells that line the inside of the esophagus. Long-term irritation of the lining of the esophagus, as happens with reflux, Barrett’s esophagus, achalasia, Plummer-Vinson syndrome, or scarring from swallowing lye, may also lead to DNA damage.

DNA is the chemical in each of our cells that makes up our *genes* – the instructions for how our cells function. We usually look like our parents because they are the source of our DNA. However, DNA affects more than how we look. Some genes control when cells grow, divide into new cells, and die. Genes that help cells grow, divide, and stay alive are called *oncogenes*. Genes that slow down cell division or make cells 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.

The DNA of esophageal cancer cells often shows changes in many different genes. However, it’s not clear if there are specific gene changes that can be found in all (or most) esophageal cancers.

Some people inherit DNA changes (mutations) from their parents that increase their risk for developing certain cancers. But esophageal cancer does not seem to run in families, and inherited gene mutations are not thought to be a major cause of this disease.

Can cancer of the esophagus be prevented?

Not all esophageal cancers can be prevented, but the risk of developing this disease can be greatly reduced by avoiding certain risk factors.

Avoiding tobacco and alcohol

In the United States, the most important lifestyle risk factors for cancer of the esophagus are the use of tobacco and alcohol. Each of these factors alone increases the risk of esophageal cancer many times, and the risk is even greater if they are combined. Avoiding tobacco and alcohol is one of the best ways of limiting your risk of esophageal cancer. If you or someone you know would like to quit tobacco or learn more about it, call us at 1-800-227-2345 or visit our Tobacco information page.

Watching your diet and body weight

Eating a healthy diet and staying at a healthy weight are also important. A diet rich in fruits and vegetables may help protect against esophageal cancer. Obesity has been linked with esophageal cancer, particularly the adenocarcinoma type, so staying at a healthy weight may also help limit the risk of this disease. For more on this, you can read our *American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention*.

Getting treated for reflux or Barrett's esophagus

Treating people with reflux may help prevent Barrett's esophagus and esophageal cancer. Often, reflux is treated using drugs called proton pump inhibitors (PPIs), such as omeprazole (Prilosec®), lansoprazole (Prevacid®), or esomeprazole (Nexium®). Surgery might also be an option for treating reflux.

People at a higher risk for esophageal cancer, such as those with Barrett's esophagus, are often watched closely by their doctors to look for signs that the cells lining the esophagus have become more abnormal (see "Can cancer of the esophagus be found early?"). If dysplasia (a pre-cancerous condition) is found, the doctor may recommend treatments to keep it from progressing to esophageal cancer.

For those who have Barrett's esophagus, treatment with a high dose of a PPI might lower the risk of developing cell changes (dysplasia) that can turn into cancer. If you have chronic heartburn (or reflux), tell your doctor. Treatment can often improve symptoms and might prevent future problems.

Some studies have found that the risk of cancer of the esophagus is lower in people with Barrett's esophagus who take aspirin or other non-steroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen. However, taking these drugs every day can lead to problems, such as kidney damage and bleeding in the stomach. For this reason, most doctors don't advise that people take NSAIDs to try to prevent cancer. If you are thinking of taking an NSAID regularly, discuss the potential benefits and risks with your doctor first.

Some studies have also found a lower risk of esophageal cancer in people with Barrett's esophagus who take drugs called *statins*, which are used to treat high cholesterol. Examples include atorvastatin (Lipitor®) and rosuvastatin (Crestor®). While taking one of these drugs might help some patients lower esophageal cancer risk, doctors don't advise taking them just to prevent cancer because they can have serious side effects.

Can cancer of the esophagus be found early?

Looking for a disease in someone without symptoms is called *screening*. The goal of screening is to find a disease like cancer in an early, more curable stage, in order to help people live longer, healthier lives.

In the United States, screening the general public for esophageal cancer is not recommended by any professional organization at this time. This is because no screening test has been shown to lower the risk of dying from esophageal cancer in people who are at average risk.

However, people who have a high risk of esophageal cancer, such as those with Barrett's esophagus, are often followed closely to look for early cancers and pre-cancers.

Testing people at high risk

Many experts recommend that people with a high risk of esophageal cancer, such as those with Barrett's esophagus, have upper endoscopy regularly. For this test, the doctor looks at the inside of the esophagus through a flexible lighted tube called an *endoscope* (see "How is cancer of the esophagus diagnosed?"). The doctor may remove small samples of tissue (biopsies) from the area of Barrett's so that they can be checked for dysplasia (pre-cancer cells) or cancer cells.

Doctors aren't certain how often the test should be repeated, but most recommend testing more often if areas of dysplasia are found. This testing is repeated even more often if there is high-grade dysplasia (the cells appear very abnormal).

If the area of Barrett's is large and/or there is high-grade dysplasia, treatment of the abnormal area might be advised because of the high risk that an adenocarcinoma is either already present (but was not found) or will develop within a few years. Treatment options for high-grade dysplasia might include surgery to remove part of the esophagus with the abnormal area, endoscopic mucosal resection (EMR), photodynamic therapy (PDT), and radiofrequency ablation (RFA). These last 3 options are discussed in the "Endoscopic treatments for cancer of the esophagus" section of this document. The outlook for these patients is relatively good after treatment.

Careful monitoring and treatment (if needed) may help prevent some esophageal cancers from developing. It may also detect some cancers early, when they are more likely to be treated successfully.

Signs and symptoms of esophagus cancer

Cancers of the esophagus are usually found because of the symptoms they cause. Diagnosis in people without symptoms is rare and usually accidental (because of tests done for other medical problems). Unfortunately, most esophageal cancers do not cause symptoms until they have reached an advanced stage, when they are harder to treat.

Trouble swallowing

The most common symptom of esophageal cancer is a problem swallowing, with a feeling like the food is stuck in the throat or chest, or even choking on food. The medical term for

trouble swallowing is *dysphagia*. This is often mild when it starts, and then gets worse over time as the opening inside the esophagus gets narrower.

When swallowing becomes harder, people often change their diet and eating habits without realizing it. They take smaller bites and chew their food more carefully and slowly. As the cancer grows larger, the problem can get worse. People then may start eating softer foods that can pass through the esophagus more easily. They may avoid bread and meat, since these foods typically get stuck. The swallowing problem may even get bad enough that some people stop eating solid food completely and switch to a liquid diet. If the cancer keeps growing, at some point even liquids might be hard to swallow.

To help pass food through the esophagus, the body makes more saliva. This causes some people to complain of bringing up lots of thick mucus or saliva.

Chest pain

Sometimes, people complain of pain or discomfort in the middle part of their chest. Some people describe a feeling of pressure or burning in the chest. These symptoms are more often caused by problems other than cancer, such as heartburn, so they are rarely seen as a signal that a person might have cancer.

Swallowing may become painful if the cancer is large enough to limit the passage of food through the esophagus. Pain may be felt a few seconds after swallowing, as food or liquid reaches the tumor and has trouble getting past it.

Weight loss

About half of people with esophageal cancer lose weight (without trying to). This happens because their swallowing problems keep them from eating enough to maintain their weight. Other factors include a decreased appetite and an increase in metabolism from the cancer.

Other symptoms

Other possible symptoms of cancer of the esophagus can include:

- Hoarseness
- Chronic cough
- Vomiting
- Hiccups
- Pneumonia
- Bone pain

- Bleeding into the esophagus. This blood then passes through the digestive tract, which may turn stools black. Over time, this blood loss can lead to anemia (low red blood cell levels), which can make a person feel tired.

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

How is cancer of the esophagus diagnosed?

Esophagus cancers are usually found because of signs or symptoms a person is having. If esophagus cancer is suspected, exams and tests will be needed to confirm the diagnosis. If cancer is found, further tests will be done to help determine the extent (stage) of the cancer.

Medical history and physical exam

If you have symptoms that might be caused by esophageal cancer, the doctor will ask about your medical history to check for possible risk factors and to learn more about your symptoms.

Your doctor will also examine you to look for possible signs of esophageal cancer and other health problems. He or she will probably pay special attention to your neck and chest areas.

If the results of the exam are abnormal, your doctor probably will order tests to help find the problem. You may also be referred to a gastroenterologist (a doctor specializing in digestive system diseases) for further tests and treatment.

Imaging tests

Imaging tests use x-rays, magnetic fields, sound waves, or radioactive substances to create pictures of the inside of your body. Imaging tests might be done for a number of reasons both before and after a diagnosis of esophageal cancer, including:

- To help find a suspicious area that might be cancer
- To learn if and how far cancer has spread
- To help determine if the treatment has been effective
- To look for possible signs of cancer coming back after treatment

Barium swallow

In this test, a thick, chalky liquid called *barium* is swallowed to coat the walls of the esophagus. X-rays of the esophagus are then taken, which the barium outlines clearly. This test can be done by itself, or as a part of a series of x-rays that includes the stomach and part of the intestine, called an *upper gastrointestinal (GI) series*. A barium swallow test can show any abnormal areas in the normally smooth surface of the inner lining of the esophagus.

This is often the first test done to see what is causing a problem with swallowing. Even small, early cancers can often be seen using this test. Early cancers can look like small round bumps or flat, raised areas (called *plaques*), while advanced cancers look like large irregular areas and cause a narrowing of the width of the esophagus.

This test can also be used to diagnose one of the more serious complications of esophageal cancer called a *tracheo-esophageal fistula*. This occurs when the tumor destroys the tissue between the esophagus and the trachea (windpipe) and creates a hole connecting them. Anything that is swallowed can then pass from the esophagus into the windpipe and lungs. This can lead to frequent coughing, gagging, or even pneumonia. This problem can be helped with surgery or an endoscopy procedure.

A barium swallow only shows the shape of the inner lining of the esophagus, so it can't be used to determine how far a cancer may have spread outside of the esophagus.

Computed tomography (CT or CAT) scan

The CT scan uses x-rays to produce detailed cross-sectional images of your body. CT scans are not usually used to diagnose esophageal cancer, but they can help show where it is in the esophagus and if it has spread to nearby organs and lymph nodes (bean-sized collections of immune cells to which cancers often spread first) or to distant parts of the body. The CT scan can help to determine whether surgery is a good treatment option.

A CT scanner has been described as a large donut, with a narrow table that slides in and out of 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. Instead of taking one picture, like a standard x-ray, a CT scanner takes many pictures as it rotates around you. A computer then combines these pictures into an image of a slice of your body.

Before the test, you may be asked to drink 1 to 2 pints of a liquid called *oral contrast*. This helps outline the esophagus and intestines so that certain areas are not mistaken for tumors. If you are having any trouble swallowing, you need to tell your doctor before the scan. You might also receive an IV (intravenous) line through which a different kind of contrast dye (IV contrast) is injected. This helps better outline structures in your body.

The injection can cause some flushing (redness and warm feeling, especially in the face). Some people are allergic to the dye and get hives. Rarely, more serious reactions like trouble

breathing and low blood pressure can occur. 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. You can be given medicine to help prevent and treat allergic reactions.

CT-guided needle biopsy: CT scans can also be used to guide a biopsy needle precisely into a suspected area of cancer spread. For this procedure, you remain on the CT scanning table while the doctor advances a biopsy needle through the skin and toward the tumor. CT scans are repeated until the needle is within the mass. A needle biopsy sample is then removed to be looked at under a microscope.

Magnetic resonance imaging (MRI) scan

Like CT scans, MRI scans provide detailed images of soft tissues in the body. But 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 body tissue and by certain diseases. A computer translates the pattern of radio waves given off by the tissues into a very detailed image of parts of the body. A contrast material might be injected into a vein. This contrast is different than the one used for CT scans, so being allergic to one doesn't mean you are allergic to the other.

MRI scans are very helpful in looking at the brain and spinal cord, but they are not often needed to assess spread of esophageal cancer.

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

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 and will pass out of the body over the next day or so. Cancer cells in the body are growing rapidly, so they absorb large amounts of the radioactive sugar. After about an hour, you will be moved onto a table in the PET scanner. You lie on the table for about 30 minutes while a special camera creates a picture of areas of radioactivity in the body. The picture is not finely detailed like a CT or MRI scan, but it provides helpful information about your whole body.

This type of scan may be used to look for possible areas of cancer spread if nothing is found on other imaging tests.

Special 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 scan with the more detailed appearance of that area on the CT scan.

Endoscopy

An endoscope is a flexible, narrow tube with a tiny video camera and light on the end that is used to look inside the body. Tests that use endoscopes can help diagnose esophageal cancer or determine the extent of its spread.

Upper endoscopy

This is an important test for diagnosing esophageal cancer. During an upper endoscopy, you are sedated (made sleepy) and then the doctor passes the endoscope down the throat and into the esophagus and stomach. The camera is connected to a monitor, which lets the doctor see any abnormal areas in the wall of the esophagus clearly.

The doctor can use special instruments through the scope to remove (biopsy) samples from any abnormal areas. These samples are sent to the lab so that a doctor can look at them under a microscope to see if they contain cancer.

If the esophageal cancer is blocking the opening (called the *lumen*) of the esophagus, certain instruments can be used to help enlarge the opening to help food and liquid pass.

Upper endoscopy can give the doctor important information about the size and spread of the tumor, which can be used to help determine if the tumor can be removed with surgery.

Endoscopic ultrasound

This test is usually done at the same time as the upper endoscopy, although it is actually a type of imaging test. Ultrasound tests use sound waves to take pictures of parts of the body.

For an endoscopic ultrasound, a probe that gives off sound waves is at the end of an endoscope, which is passed down the throat and into the esophagus. This allows the probe to get very close to tumors in the esophagus or nearby.

The probe sends out sound waves, and the echoes are picked up by the probe. A computer turns the pattern of sound waves into a black-and-white image showing how deeply the tumor has grown into the esophagus. It can detect small abnormal changes very well.

This test is very useful in determining the size of an esophageal cancer and how far it has grown into nearby areas. It can also help show if nearby lymph nodes might be affected by the cancer. If enlarged lymph nodes are seen in the chest on the ultrasound, the doctor can pass a thin, hollow needle through the endoscope to get biopsy samples of them. This helps the doctor decide if the tumor can be removed with surgery.

Bronchoscopy

This exam may be done for cancer in the upper part of the esophagus to see if it has spread to the windpipe (trachea) or the tubes leading from the windpipe into the lungs (bronchi).

For this test, a lighted, flexible fiber-optic tube (bronchoscope) is passed through your mouth or nose and down into the windpipe and bronchi. The mouth and throat are sprayed first with a numbing medicine. You may also be given medicine through an intravenous (IV) line to make you feel relaxed.

If abnormal areas are seen, small instruments can be passed down the bronchoscope to take biopsy samples.

Thoracoscopy and laparoscopy

These exams let the doctor see lymph nodes and other organs near the esophagus inside the chest (by thoracoscopy) or the abdomen (by laparoscopy) through a hollow lighted tube.

These procedures are done in an operating room while you are under general anesthesia (in a deep sleep). A small cut (incision) is made in the side of the chest wall (for thoracoscopy) or the abdomen (for laparoscopy). Sometimes more than one cut is made. The doctor then inserts a thin, lighted tube with a small video camera on the end through the incision to view the space around the esophagus. The surgeon can pass thin instruments into the space to remove lymph node and biopsy samples to see if the cancer has spread. This information is often important in deciding whether or not a person is likely to benefit from surgery.

Lab testing of biopsy samples

An area seen on endoscopy or on an imaging test may look like cancer, but the only way to know for sure is to do a biopsy. For a biopsy, the doctor removes small pieces of tissue from an abnormal area. This is most often done during an endoscopy exam.

A doctor called a *pathologist* then looks at the tissue under a microscope to see if it contains cancer cells. If there is cancer, the pathologist will determine the type (adenocarcinoma or squamous cell) and the grade of the cancer (how abnormal the patterns of cells look under the microscope). For details about grading, see the next section “How is cancer of the esophagus staged?” It can often take a few days to get the results of a biopsy.

HER2 testing: If esophageal cancer is found but is too advanced for surgery, your biopsy samples may be tested for the HER2 gene or protein. Some people with esophageal cancer have too much of the HER2 protein on the surface of their cancer cells, which helps the cells grow. A drug that targets the HER2 protein, known as trastuzumab (Herceptin®), may help treat these cancers when used along with chemotherapy. Only cancers that have too much of the HER2 gene or protein are likely to be affected by this drug, which is why doctors may

test tumor samples for it. (See the “Targeted therapy for cancer of the esophagus” section for more information on this treatment.)

Other tests

When looking for signs of esophageal cancer, a doctor may order a blood test called a *complete blood count* (CBC) to look for anemia (a low red blood cell count, which could be caused by internal bleeding). A stool sample may be checked to see if it contains occult (unseen) blood.

If esophageal cancer is found, the doctor may order other tests, especially if surgery might be an option. For instance, blood tests can be done to make sure your liver and kidneys are working normally. Tests may also be done to check your lung function, since some people might have lung problems (such as pneumonia) after surgery. If surgery is planned or you are going to get medicines that could affect your heart, you may also have an electrocardiogram (EKG) and echocardiogram (ultrasound of the heart) to make sure your heart is working well.

How is cancer of the esophagus staged?

The stage of esophageal cancer is a standard way for doctors to sum up how far the cancer has spread. The treatment and outlook for people with esophageal cancer depend, to a large extent, on the cancer’s stage. Staging for esophageal cancer can be confusing, so ask your cancer care team to explain the stage of your cancer to you in a way you understand. This can help you make informed choices about your treatment.

Esophageal cancer is staged based on the results of exams, imaging tests, endoscopies, and biopsies, which are described in “How is cancer of the esophagus diagnosed?”

TNM staging system

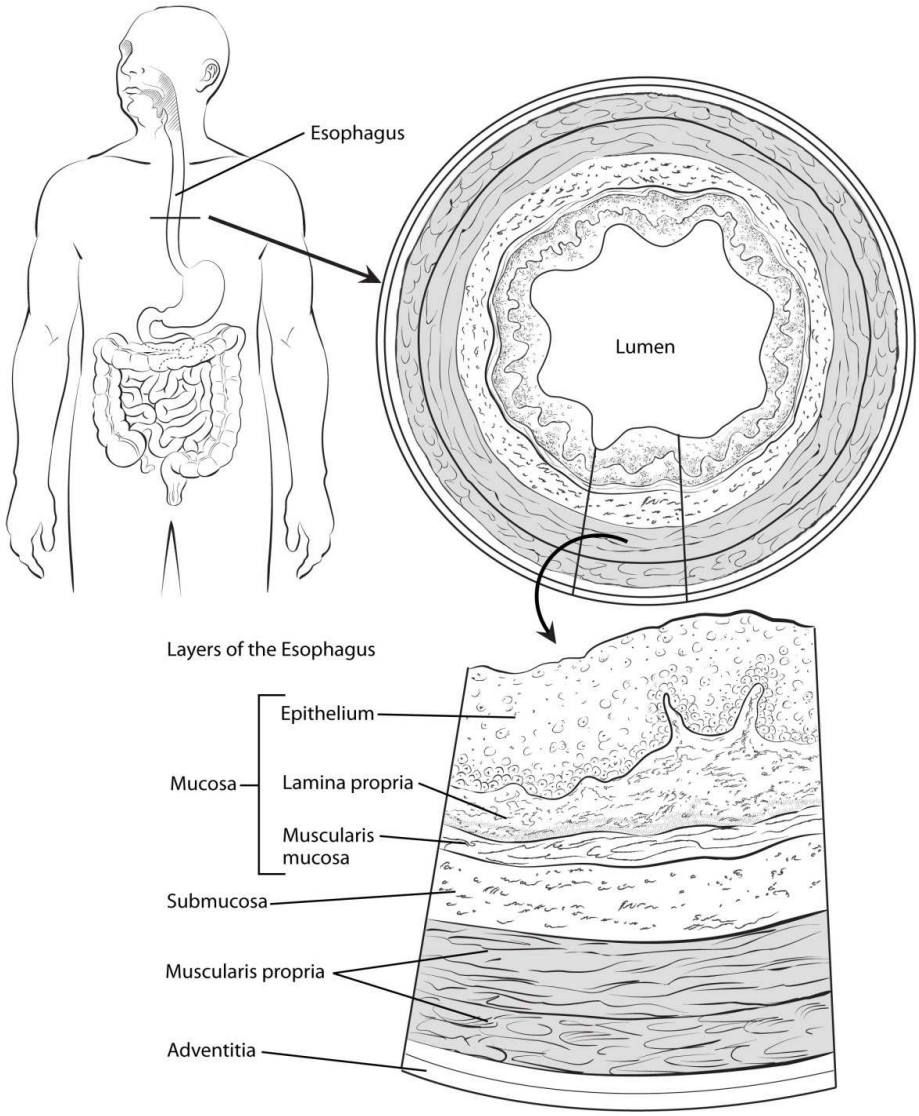
The most common system used to stage esophageal cancer is the TNM system of the American Joint Committee on Cancer (AJCC). The TNM system is based on several key pieces of information:

- **T** refers to how far the primary **tumor** has grown into the wall of the esophagus and into nearby organs.
- **N** refers to cancer spread to nearby lymph **nodes**.
- **M** indicates whether the cancer has **metastasized** (spread to distant organs).
- **G** describes the **grade** of the cancer, which is based on how the patterns of cancer cells look under a microscope.

Staging also takes into account the cell type of the cancer (squamous cell carcinoma or adenocarcinoma). For squamous cell cancers, the location of the tumor can also be a factor in staging.

T categories

This describes how deeply the cancer has grown into the wall of the esophagus or into nearby structures. Most esophageal cancers start in the innermost lining of the esophagus (the epithelium) and then grow into deeper layers over time. (See “What is esophagus cancer?” for a description of the layers of the esophagus wall.)



TX: The primary tumor can’t be assessed.

T0: There is no evidence of a primary tumor.

Tis: The cancer is only in the epithelium (the top layer of cells lining the inside of the esophagus). It has not started growing into the deeper layers. This stage is also known as *high-grade dysplasia*. In the past it was called *carcinoma in situ*.

T1: The cancer is growing into the tissue under the epithelium, such as the lamina propria, muscularis mucosa, or submucosa.

- **T1a**: The cancer is growing into the lamina propria or muscularis mucosa
- **T1b**: The cancer has grown through the other layers and into the submucosa

T2: The cancer is growing into the thick muscle layer (muscularis propria).

T3: The cancer is growing into the outer layer of the esophagus (the adventitia).

T4: The cancer is growing into nearby structures.

- **T4a:** The cancer is growing into the pleura (the thin layer of tissue covering the lungs), the pericardium (the thin sac surrounding the heart), or the diaphragm (the thin sheet of muscle below the lungs that separates the chest from the abdomen). The cancer can be removed with surgery.
- **T4b:** The cancer cannot be removed with surgery because it has grown into the trachea (windpipe), the aorta (the large blood vessel coming from the heart), the spine, or other crucial structures.

N categories

NX: Nearby lymph nodes can’t be assessed.

N0: The cancer has not spread to nearby lymph nodes.

N1: The cancer has spread to 1 or 2 nearby lymph nodes.

N2: The cancer has spread to 3 to 6 nearby lymph nodes.

N3: The cancer has spread to 7 or more nearby lymph nodes.

M categories

M0: The cancer has not spread (metastasized) to distant organs or lymph nodes.

M1: The cancer has spread to distant lymph nodes and/or other organs. (Common sites of spread include the liver and lungs.)

Grade

The grade of a cancer is based on how normal (or differentiated) the cells look under the microscope. The higher the number, the more abnormal the cells look. Higher grade tumors tend to grow and spread faster than lower grade tumors.

GX: The grade cannot be assessed (treated in stage grouping as G1).

G1: The cells are well-differentiated.

G2: The cells are moderately differentiated

G3: The cells are poorly differentiated

G4: The cells are undifferentiated (these cells are so abnormal that doctors can't tell if they are adenocarcinoma or squamous cell carcinoma). For stage grouping (see below), G4 cancers are grouped with G3 squamous cell cancers.

Location

Some stages of early squamous cell carcinoma also take into account where the tumor is in the esophagus. The location is assigned as either *upper*, *middle*, or *lower* based on where the upper edge of the tumor is.

Stage grouping

Once the T, N, M, and G categories have been assigned, this information is combined into an overall stage of 0, I, II, III, or IV. This process is called *stage grouping*. Some stages are further subdivided into A, B, or C. The stages identify cancers that have a similar prognosis (outlook). Patients with lower stage numbers tend to have a better prognosis.

The stage groupings for squamous cell carcinoma and adenocarcinoma are different. Cancers that have features of both squamous cell and adenocarcinoma are staged as squamous cell carcinomas.

Squamous cell carcinoma stages

Stage 0: Tis, N0, M0, GX or G1; any location: This is the earliest stage of esophageal cancer. It is also called *high-grade dysplasia*. The cancer cells are found only in the epithelium (the layer of cells lining the esophagus). The cancer has not grown into the connective tissue beneath these cells (Tis). The cancer has not spread to nearby lymph nodes (N0) or other organs (M0). The tumor is well differentiated (G1) or grade information is not available (GX), and it can be anywhere along the esophagus.

Stage IA: T1, N0, M0, GX or G1; any location: The cancer has grown from the epithelium into the layers below, such as the lamina propria, muscularis mucosa, or submucosa, but it

has not grown any deeper (T1). It has not spread to nearby lymph nodes (N0) or to distant sites (M0). The tumor is well differentiated (G1) or grade information is not available (GX). It can be anywhere along the esophagus.

Stage IB: Either of the following:

T1, N0, M0, G2 or G3; any location: The cancer has grown from the epithelium into the layers below, such as the lamina propria, muscularis mucosa, or submucosa, but it has not grown any deeper (T1). It has not spread to nearby lymph nodes (N0) or to distant sites (M0). It is moderately (G2) or poorly differentiated (G3). The tumor can be anywhere in the esophagus.

T2 or T3, N0, M0, GX or G1; location lower: The cancer has grown into the muscle layer called the *muscularis propria* (T2). It may also have grown through the muscle layer into the adventitia, the connective tissue covering the outside of the esophagus (T3). The cancer has not spread to nearby lymph nodes (N0) or to distant sites (M0). It is well differentiated (G1) or grade information is not available (GX). Its highest point is in the lower part of the esophagus.

Stage IIA: Either of the following:

T2 or T3, N0, M0, GX or G1; location upper or middle: The cancer has grown into the muscle layer called the *muscularis propria* (T2). It may also have grown through the muscle layer into the adventitia, the connective tissue covering the outside of the esophagus (T3). The cancer has not spread to nearby lymph nodes (N0) or to distant sites (M0).The cancer is in the upper or middle part of the esophagus and is well differentiated (G1) or grade information is not available (GX).

T2 or T3, N0, M0, G2 or G3; location lower: The cancer has grown into the muscle layer called the *muscularis propria* (T2). It may also have grown through the muscle layer into the adventitia, the connective tissue covering the outside of the esophagus (T3). The cancer has not spread to lymph nodes (N0) or to distant sites (M0).The cancer is in the lower part of the esophagus and is moderately (G2) or poorly differentiated (G3).

Stage IIB: Either of the following:

T2 or T3, N0, M0, G2 or G3; location upper or middle: The cancer has grown into the muscle layer called the *muscularis propria* (T2). It may also have grown through the muscle layer into the adventitia, the connective tissue covering the outside of the esophagus (T3). The cancer has not spread to nearby lymph nodes (N0) or to distant sites (M0). It is in the upper or middle part of the esophagus and is moderately (G2) or poorly differentiated (G3).

T1 or T2, N1, M0, any G; any location: The cancer has grown into the layers below the epithelium, such as the lamina propria, muscularis mucosa, or submucosa (T1). It may also have grown into the muscularis propria (T2). It has not grown through to the outer layer of tissue covering the esophagus. It has spread to 1 or 2 lymph nodes near the esophagus (N1)

but has not spread to lymph nodes further away from the esophagus or to distant sites (M0). It can be any grade (G) and can be anywhere along the esophagus.

Stage IIIA: Any of the following:

T1 or T2, N2, M0, any G; any location: The cancer has grown into the layers below the epithelium, such as the lamina propria, muscularis mucosa, or submucosa (T1). It may also have grown into the muscularis propria (T2). It has not grown through to the outer layer of tissue covering the esophagus. It has spread to 3 to 6 lymph nodes near the esophagus (N2) but it has not spread to lymph nodes farther away from the esophagus or to distant sites (M0). It can be any grade (G) and can be anywhere along the esophagus.

T3, N1, M0, any G; any location: The cancer has grown through the wall of the esophagus to its outer layer, the adventitia (T3). It has spread to 1 or 2 lymph nodes near the esophagus (N1), but it has not spread to lymph nodes farther away from the esophagus or to distant sites (M0). It can be any grade (G) and can be anywhere along the esophagus.

T4a, N0, M0, any G; any location: The cancer has grown all the way through the esophagus and into nearby organs or tissues (T4a) but still can be removed. It has not spread to nearby lymph nodes (N0) or to distant sites (M0). It can be any grade (G) and can be anywhere along the esophagus.

Stage IIIB: T3, N2, M0, any G; any location: The cancer has grown through the wall of the esophagus to its outer layer, the adventitia (T3). It has spread to 3 to 6 lymph nodes near the esophagus (N2), but has not spread to lymph nodes farther away from the esophagus or to distant sites (M0). It can be any grade (G) and can be anywhere along the esophagus.

Stage IIIC: Any of the following:

T4a, N1 or N2, M0, any G; any location: The cancer has grown all the way through the esophagus and into nearby organs or tissues (T4a) but still can be removed. It has spread to 1 to 6 lymph nodes near the esophagus (N1 or N2), but it has not spread to lymph nodes farther away from the esophagus or to distant sites (M0). It can be any grade (G) and can be anywhere along the esophagus.

T4b, any N, M0, any G; any location: The cancer cannot be removed with surgery because it has grown into the trachea (windpipe), the aorta (the large blood vessel coming from the heart), the spine, or other crucial structures (T4b). It may or may not have spread to nearby lymph nodes (any N), but it has not spread to lymph nodes farther away from the esophagus or to distant sites (M0). It can be any grade (G) and can be anywhere along the esophagus.

Any T, N3, M0, any G; any location: The cancer has spread to 7 or more nearby lymph nodes (N3), but it has not spread to lymph nodes farther away from the esophagus or to distant sites (M0). It can be any grade and can be anywhere along the esophagus.

Stage IV: Any T, any N, M1, any G; any location: The cancer has spread to distant lymph nodes or other sites (M1). It can be any grade (G) and can be anywhere along the esophagus.

Adenocarcinoma stages

The location of the cancer along the esophagus does not affect the stage of adenocarcinomas.

Stage 0: Tis, N0, M0, GX or G1: This is the earliest stage of esophageal cancer. It is also called *high-grade dysplasia*. The cancer cells are found only in the epithelium (the layer of cells lining of the esophagus). The cancer has not grown into the connective tissue beneath these cells (Tis). The cancer has not spread to nearby lymph nodes (N0) or other organs (M0). It is well differentiated (G1) or grade information is not available (GX).

Stage IA: T1, N0, M0, GX, G1, or G2: The cancer has grown from the epithelium into the layers below, such as the lamina propria, muscularis mucosa, or submucosa, but it has not grown any deeper (T1). It has not spread to nearby lymph nodes (N0) or to distant sites (M0). It is well (G1) or moderately differentiated (G2), or grade information is not available (GX).

Stage IB: Either of the following:

T1, N0, M0, G3: The cancer has grown from the epithelium into the layers below, such as the lamina propria, muscularis mucosa, or submucosa, but it has not grown any deeper (T1). It has not spread to nearby lymph nodes (N0) or to distant sites (M0). It is poorly differentiated (G3).

T2, N0, M0, GX, G1, or G2: The cancer has grown into the muscle layer called the *muscularis propria* (T2). It has not spread to nearby lymph nodes (N0) or to distant sites (M0). It is well (G1) or moderately differentiated (G2), or grade information is not available (GX).

Stage IIA: T2, N0, M0, G3: The cancer has grown into the muscle layer called the *muscularis propria* (T2). It has not spread to nearby lymph nodes (N0) or to distant sites (M0). It is poorly differentiated (G3).

Stage IIB: Either of the following:

T3, N0, M0, any G: The cancer has grown through the wall of the esophagus to its outer layer, the adventitia (T3). It has not spread to nearby lymph nodes (N0) or to distant sites (M0). It can be any grade.

T1 or T2, N1, M0, any G: The cancer has grown into the layers below the epithelium, such as the lamina propria, muscularis mucosa, or submucosa (T1). It may also have grown into the muscularis propria (T2). It has not grown through to the outer layer of tissue covering the esophagus. It has spread to 1 or 2 lymph nodes near the esophagus (N1), but it has not spread to lymph nodes farther away from the esophagus or to distant sites (M0). It can be any grade.

Stage IIIA: Any of the following:

T1 or T2, N2, M0, any G: The cancer has grown into the layers below the epithelium, such as the lamina propria, muscularis mucosa, or submucosa (T1). It may also have grown into the muscularis propria (T2). It has not grown through to the outer layer of tissue covering the

esophagus. It has spread to 3 to 6 lymph nodes near the esophagus (N2) but it has not spread to lymph nodes farther away from the esophagus or to distant sites (M0). It can be any grade (G).

T3, N1, M0, any G: The cancer has grown through the wall of the esophagus to its outer layer, the adventitia (T3). It has spread to 1 or 2 lymph nodes near the esophagus (N1), but it has not spread to lymph nodes farther away from the esophagus or to distant sites (M0). It can be any grade (G).

T4a, N0, M0, any G: The cancer has grown all the way through the esophagus and into nearby organs or tissues (T4a) but still can be removed. It has not spread to nearby lymph nodes (N0) or to distant sites (M0). It can be any grade (G).

Stage IIIB: T3, N2, M0, any G: The cancer has grown through the wall of the esophagus to its outer layer, the adventitia (T3). It has spread to 3 to 6 lymph nodes near the esophagus (N2), but it has not spread to lymph nodes farther away from the esophagus or to distant sites (M0). It can be any grade (G).

Stage IIIC: Any of the following:

T4a, N1 or N2, M0, any G: The cancer has grown all the way through the esophagus and into nearby organs or tissues (T4a) but still can be removed. It has spread to 1 to 6 lymph nodes near the esophagus (N1 or N2), but it has not spread to lymph nodes farther away from the esophagus or to distant sites (M0). It can be any grade (G).

T4b, any N, M0, any G: The cancer cannot be removed with surgery because it has grown into the trachea (windpipe), the aorta (the large blood vessel coming from the heart), the spine, or other crucial structures (T4b). It may or may not have spread to nearby lymph nodes (any N), but it has not spread to lymph nodes farther away from the esophagus or to distant sites (M0). It can be any grade (G).

Any T, N3, M0, any G: The cancer has spread to 7 or more nearby lymph nodes (N3), but it has not spread to lymph nodes farther away from the esophagus or to distant sites (M0). It can be any grade (G).

Stage IV: Any T, any N, M1, any G: The cancer has spread to distant lymph nodes or other sites (M1). It can be any grade (G).

Resectable versus unresectable cancer

The AJCC staging system provides a detailed summary of how far the cancer has spread. But for treatment purposes, doctors are often more concerned about whether the cancer can be removed completely with surgery (resected). If, based on where the cancer is and how far it has spread, it could be removed completely by surgery, it is considered potentially *resectable*. If the cancer has spread too far to be removed completely, it is considered *unresectable*.

As a general rule, all stage 0, I, and II esophageal cancers are potentially resectable. Most stage III cancers are potentially resectable as well, even when they have spread to nearby lymph nodes, as long as the cancer has not grown into the trachea (windpipe), the aorta (the large blood vessel coming from the heart), the spine, or other nearby crucial structures. Unfortunately, many people whose cancer is potentially resectable may not be able to have surgery to remove their cancers because they aren't healthy enough.

Cancers that have grown into these structures or that have spread to distant lymph nodes or to other organs are considered unresectable, so treatments other than surgery are usually the best option.

Survival rates for cancer of the esophagus by stage

Survival rates are often used by doctors as a standard way of discussing a person's prognosis (outlook). Some people 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 decide that you don't want to know them, 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 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 chances of dying from a particular type and stage of cancer.

To get 5-year survival rates, doctors 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 esophagus cancer.

Survival rates are not readily available for each stage in the AJCC staging system for esophageal cancer. The survival rates below come from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) database, and are based on patients who were diagnosed with esophageal cancer between 2003 and 2009. The SEER database doesn't divide survival rates by AJCC TNM stage. Instead, it divides cancers into 3 larger, summary stages:

- **Localized** means that the cancer is only growing in the esophagus. It includes AJCC stage I and some stage II tumors (such as those that are T1, T2, or T3, N0, M0). Stage 0 cancers are not included in these statistics.
- **Regional** means that the cancer has spread to nearby lymph nodes or tissues. This includes T4 tumors and cancers with lymph node spread (N1, N2, or N3).

- **Distant** means that the cancer has spread to organs or lymph nodes away from the tumor, and includes all M1 (stage IV) cancers.

Stage	**5-Year Relative Survival Rate**
Localized	40%
Regional	21%
Distant	4%

These survival rates for esophageal cancer do not separate squamous cell carcinomas from adenocarcinomas, although people with adenocarcinomas are generally thought to have a slightly better prognosis (outlook) overall.

Survival rates are often based on previous outcomes of large numbers of people who had the disease, but they can't predict what will happen with any particular person. Knowing the type and the stage of a person's cancer is important in estimating their outlook. But many other factors are also important, such as the treatment received, how well the cancer responds to treatment, and a person's overall health. Even when taking these other factors into account, survival rates are at best rough estimates. Your doctor can tell you how well these numbers may apply to you, as he or she knows your situation best.

How is cancer of the esophagus treated?

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

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

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

General treatment information

After the cancer is found and staged, your cancer care team will discuss treatment options with you. It is important that you take time to think about your choices. You will want to weigh the benefits of each treatment option against the possible risks and side effects. In choosing a treatment plan, 2 of the main factors to consider are your overall health and the stage (extent) of the cancer.

The main options for treatment of cancer of the esophagus include:

- Surgery
- Radiation
- Chemotherapy
- Targeted therapy
- Endoscopic treatments

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

Depending on the stage of the cancer and your general 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 could include:

- A thoracic surgeon: a doctor who treats diseases of the chest with surgery
- A radiation oncologist: a doctor who treats cancer with radiation therapy
- A medical oncologist: a doctor who treats cancer with medicines such as chemotherapy
- A gastroenterologist: a doctor who specializes in treatment of diseases of the digestive system

Many other specialists might be part of your treatment team as well, including physician assistants, nurse practitioners, nurses, nutrition specialists, social workers, and other health professionals. See *Health Professionals Associated With Cancer Care* for more on this.

It is important to discuss all treatment options as well as their possible side effects with your doctors to help make the decision that best fits your needs. You may feel that you need to make a decision quickly, but it's important to give yourself time to absorb the information you have learned. Ask your cancer care team questions. You can find some good questions to ask in the section, "What should you ask your doctor about cancer of the esophagus?"

If time permits, it's often a good idea to seek a second opinion. A second opinion can give you more information and help you feel confident about the treatment plan you choose.

The next few sections describe the different types of treatment for esophagus cancer. This is followed by a discussion of the most common treatment options based on the stage of the cancer, as well as information about recurrent esophagus cancer and palliative treatment options.

Surgery for cancer of the esophagus

For some earlier stage cancers, surgery can be used to try to remove the cancer and some of the normal surrounding tissue. In some cases, it might be combined with other treatments, such as chemotherapy and/or radiation therapy.

Esophagectomy

Surgery to remove some or most of the esophagus is called an *esophagectomy*. Often a small part of the stomach is removed as well. The upper part of the esophagus is then connected to the remaining part of the stomach. Part of the stomach is pulled up into the chest or neck to become the new esophagus. How much of the esophagus is removed depends upon the stage of the tumor and where it's located.

If the cancer is in the lower part of the esophagus (near the stomach) or at the place where the esophagus and stomach meet (the gastroesophageal or GE junction), the surgeon will remove part of the stomach, the part of the esophagus containing the cancer, and about 3 to 4 inches of normal esophagus above this. Then the stomach is connected to what is left of the esophagus either high in the chest or in the neck.

If the tumor is in the upper or middle part of the esophagus, most of the esophagus will need to be removed to be sure to get enough tissue above the cancer. The stomach will then be brought up and connected to the esophagus in the neck. If for some reason the stomach can't be pulled up to attach it to the remaining part of the esophagus, the surgeon may use a piece of the intestine to bridge the gap between the two. When a piece of intestine is used, it must be moved without damaging its blood vessels. If the vessels are damaged, not enough blood will get to that piece of intestine, and the tissue will die.

Esophagectomy may be done using either of 2 main types of techniques. In the standard, open technique, the surgeon operates through one or more large incisions (cuts) in the neck, chest, or abdomen. In minimally invasive surgery, the surgeon operates through several smaller incisions using special long, thin surgical instruments.

Open esophagectomy: Many different approaches can be used to remove part of the esophagus.

- For a *transthoracic esophagectomy*, the esophagus is removed with the main incisions in the abdomen and the chest.
- If the main incisions are in the abdomen and neck, it is called a *transhiatal esophagectomy*.
- Some procedures are done through incisions in the neck, chest, and abdomen.

You and your surgeon should discuss in detail the operation planned for you and what you can expect.

Minimally invasive esophagectomy: For some early (small) cancers, the esophagus can be removed through several small incisions instead of large incisions. The surgeon puts a scope (like a tiny telescope) through one of the incisions to see everything during the operation. Then the surgical instruments go in through other small incisions. In order to do this type of procedure well, the surgeon needs to be highly skilled and have a great deal of experience removing the esophagus this way. Because it uses smaller incisions, minimally invasive esophagectomy may allow the patient to leave the hospital sooner and recover faster.

No matter which approach is used, esophagectomy is not a simple operation, and it may require a long hospital stay. It is very important to have it done at a center that has a lot of experience treating these cancers and performing these procedures.

If the cancer has not yet spread far beyond the esophagus, removing the esophagus (and nearby lymph nodes) may cure the cancer. Unfortunately, most esophageal cancers are not found early enough for doctors to cure them with surgery.

Lymph node removal

For either type of esophagectomy, nearby lymph nodes are removed during the operation as well. These are then checked to see if they contain cancer cells. If the cancer has spread to lymph nodes, the outlook is not as good, and the doctor may recommend other treatments (like chemotherapy and/or radiation) after surgery.

Risks and side effects of esophagectomy

Like most serious operations, surgery of the esophagus has some risks. Short-term risks include reactions to anesthesia, excess bleeding, blood clots in the lungs or elsewhere, and infections. Most people will have at least some pain after the operation, which can usually be helped with pain medicines.

Lung complications are common. Pneumonia may develop, leading to a longer hospital stay, and sometimes even death.

Some people might have voice changes after the surgery.

There may be a leak at the place where the stomach (or intestine) is connected to the esophagus, which might require another operation to fix. This is not as common as it used to be because of improvements in surgical techniques.

Strictures (narrowing) can form where the esophagus is surgically connected to the stomach, which can cause problems swallowing for some patients. To relieve this symptom, these strictures can be expanded during an upper endoscopy procedure.

After the operation, the stomach may empty too slowly because the nerves that control its contractions can be affected by surgery. This can sometimes lead to frequent nausea and vomiting.

After surgery, bile and stomach contents can enter the esophagus because the muscle that normally controls this (the lower esophageal sphincter) is often removed or changed by the surgery. This can cause symptoms such as heartburn. Sometimes antacids or motility drugs can help relieve these symptoms.

Some complications from this surgery can be life threatening. The risk of dying from this operation is related to the doctor's experience with these procedures. In general, the best outcomes are achieved with surgeons and hospitals that have the most experience. This is why patients should ask the surgeon about his or her experience: how often they operate on the esophagus, how many times they have done this procedure, and what percentage of their patients have died after this surgery. The hospital where the surgery is done is also important, and any hospital that you consider should be willing to show you their survival statistics.

For more general information about surgery as a treatment for cancer, see our document *A Guide to Cancer Surgery*.

Surgery for palliative care

Sometimes minor types of surgery are used to help prevent or relieve problems caused by the cancer, instead of trying to cure it. For example, minor surgery can be used to place a feeding tube directly into the stomach or small intestine in people who need help getting enough nutrition. This is discussed in the section "Palliative therapy for cancer of the esophagus."

Radiation therapy for cancer of the esophagus

Radiation therapy is the use of high-energy radiation to kill cancer cells. It is often combined with other types of treatment, such as chemotherapy (chemo) and/or surgery, to treat esophageal cancer. Radiation therapy may be used:

- As part of the main treatment of esophageal cancer in some patients, typically along with chemo (known as *chemoradiation*). This is often used for people who can't have surgery due to poor health or for people who don't want surgery.
- Before surgery (and along with chemo when possible), to try to shrink the cancer and make it easier to remove (called *neoadjuvant treatment*).
- After surgery (and along with chemo when possible), to try to kill any areas of cancer cells that may have been left behind but are too small to see. This is known as *adjuvant therapy*.
- To ease the symptoms of advanced esophageal cancer such as pain, bleeding, or trouble swallowing. This is called palliative therapy.

There are 2 main types of radiation therapy.

External-beam radiation therapy: This type of treatment focuses radiation from outside the body on the cancer. This is the type of radiation therapy most often used when trying to cure esophageal cancer.

Before your treatments start, the radiation team will take careful measurements to determine the correct angles for aiming the radiation beams and the proper dose of radiation. Radiation therapy is much like getting an x-ray, but the radiation is stronger. The procedure itself is painless. Each treatment lasts only a few minutes, although the setup time – getting you into place for treatment – usually takes longer. Most often, radiation treatments are given 5 days a week for several weeks.

Internal radiation therapy (brachytherapy): For this type of treatment, the doctor passes an endoscope (a long, flexible tube) down the throat to place radioactive material very close to the cancer. The radiation travels only a short distance, so it reaches the tumor but has little effect on nearby normal tissues. The radioactive source is then removed a short time later. Brachytherapy can be given 2 ways:

For *high-dose rate (HDR) brachytherapy*, the doctor leaves the radioactive material near the tumor for a few minutes at a time, which may require several treatments.

In *low-dose rate (LDR) brachytherapy*, a lower dose of radiation is put near the tumor for longer periods (1 or 2 days) at a time. The patient needs to stay in the hospital during this treatment, but it can usually be completed in only 1 or 2 sessions.

Brachytherapy is most often used with more advanced esophageal cancers to shrink tumors so a patient can swallow more easily. This technique cannot be used to treat a very large area, so it is better used as a way to relieve symptoms (and not to try to cure the cancer).

Possible side effects of radiation therapy

Side effects of external radiation therapy can include:

- Skin changes in areas getting radiation, ranging from sunburn-like to blistering and open sores
- Nausea and vomiting
- Diarrhea
- Fatigue
- Painful sores in the mouth and throat
- Dry mouth or thick saliva

These side effects are often worse if chemotherapy is given at the same time as radiation.

During treatment with either external radiation or brachytherapy, the radiation kills the normal cells in the lining of the esophagus, which can make swallowing painful. This happens shortly after starting treatment but typically improves within a few weeks of finishing.

Most side effects of radiation are temporary, but some less common side effects can be permanent. For example, in some cases radiation can cause a stricture (narrowing) in the esophagus, which might require further treatment. Radiation to the chest can cause lung damage, which may lead to problems breathing and shortness of breath.

Talk with your doctor before and during treatment about what side effects you can expect and what can be done about them.

For more general information about radiation therapy, please see the "Radiation Therapy" section of our website or our document *Understanding Radiation Therapy: A Guide for Patients and Families*.

Chemotherapy for cancer of the esophagus

Chemotherapy (chemo) uses drugs that are given through a vein or by mouth to treat cancer. These drugs enter the bloodstream and reach all areas of the body, making this treatment useful for cancer that has spread. Depending on the type and stage of esophageal cancer, chemo may be given:

- As part of the main treatment, often along with radiation therapy (known as *chemoradiation*). This is often used for people who can't have surgery due to poor health or for people who don't want surgery.
- Before surgery (and typically along with radiation therapy) to try to shrink the cancer and make it easier to remove. This is called *neoadjuvant treatment*.
- After the cancer has been removed by surgery (and typically along with radiation therapy) to try to kill any small areas of tumor cells that may have been left behind. This is known as *adjuvant treatment*.
- Alone or with radiation to help control symptoms like pain or trouble swallowing when the cancer can't be cured. This is called *palliative treatment*.

Chemo by itself rarely cures esophageal cancer. It is often given together with radiation therapy (called *chemoradiation* or *chemoradiotherapy*). Chemoradiation is often used before surgery. This can lower the chance of the cancer coming back and help people live longer than using surgery alone. Chemoradiation is also sometimes given after surgery, but it isn't clear that it is as helpful as giving it before surgery.

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

Many different chemo drugs can be used to treat esophageal cancer. Common regimens are:

- Carboplatin and paclitaxel (Taxol®) (which may be combined with radiation)
- Cisplatin and 5-fluorouracil (5-FU) (often combined with radiation)
- ECF: epirubicin (Ellence®), cisplatin, and 5-FU (especially for gastroesophageal junction tumors)
- DCF: docetaxel (Taxotere®), cisplatin, and 5-FU
- Cisplatin with capecitabine (Xeloda®)
- Oxaliplatin and either 5-FU or capecitabine

Other chemo drugs that have been used to treat cancer of the esophagus include doxorubicin (Adriamycin®), bleomycin, mitomycin, methotrexate, vinorelbine (Navelbine®), topotecan, and irinotecan (Camptosar®).

For some esophagus cancers, chemo may be used along with the targeted drug trastuzumab (Herceptin®). For more information on this drug, see “Targeted therapy for cancer of the esophagus.”

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 are also likely to be affected by chemo, which can lead to side effects. Side effects depend on the specific drugs used, their dose, and the length of treatment. Common side effects of chemo include:

- Nausea and vomiting
- Loss of appetite
- Hair loss
- Mouth sores
- Diarrhea or constipation
- Low blood counts

Chemo often affects the blood forming cells of the bone marrow, which can lead to low blood counts, and:

- An increased chance of infection (because of a shortage of white blood cells)

- Problems with bleeding or bruising (due to a shortage of blood platelets)
- Fatigue or shortness of breath (due to low red blood cell counts)

Along with the risks above, some chemo drugs can cause other, less common side effects. For example, cisplatin, oxaliplatin, docetaxel, and paclitaxel can cause nerve damage (called *peripheral neuropathy*). This can lead to problems with numbness, tingling, or pain in the hands and feet. Cisplatin can also cause hearing loss and kidney damage. Doxorubicin and epirubicin can cause heart damage if enough of the drug is given.

Most side effects improve once treatment is stopped, but 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. Let your health care team know if you have side effects, so they can be treated. There are ways to prevent and treat many of the side effects of chemo. For example, many drugs can help prevent or treat nausea and vomiting.

People with esophageal cancer have often already lost weight before the cancer was found. Treatments such as chemo, radiation, and chemoradiation can cause painful sores in the mouth and throat. These can make it hard to eat well enough to get good nutrition, making weight loss worse. Some people with esophageal cancer may need to have a feeding tube, usually called a *jejunostomy tube* (or J-tube), put in place before treatment. This is done through a small hole in the skin over the abdomen during a minor operation. A J-tube lets liquid nutrition be put directly into the small intestine to prevent further weight loss and improve nutrition. This can make treatment easier to tolerate. Feeding tubes can easily be removed when they are no longer needed.

For more information about chemo, please see the Chemotherapy section of our website, or our document *A Guide to Chemotherapy*.

Targeted therapy for cancer of the esophagus

As researchers have learned more about the changes in cells that cause cancer, they have been developed newer drugs that specifically target these changes. Targeted drugs are different from standard chemotherapy drugs. Sometimes they work when standard chemo drugs don't, and they often have different (and less severe) side effects.

Trastuzumab

A small number of esophagus cancers have too much of the HER2 protein on the surface of their cells, which can help cancer cells to grow. Having too much of this protein is caused by having too many copies of the *HER2* gene.

A drug that targets the HER2 protein, known as trastuzumab (Herceptin), may help treat these cancers when used along with chemotherapy. If you have esophageal cancer and can't have surgery, your doctor may have your tumor biopsy samples tested for the HER2 protein

or gene. Cancers that have normal amounts of the HER2 protein or gene are very unlikely to be helped by this drug.

Trastuzumab is injected into a vein (IV) once every 3 weeks along with chemo. The optimal length of time to give it is not yet known.

Most of the side effects of trastuzumab are relatively mild and can include fever and chills, weakness, nausea, vomiting, cough, diarrhea, and headache. These occur less often after the first dose. This drug also sometimes can cause heart damage, leading to the heart muscle becoming weak. This drug is not given with certain chemo drugs called *anthracyclines*, such as epirubicin (Ellence) or doxorubicin (Adriamycin), because it can further increase the risk of heart damage if they are given together. Before starting treatment with this drug, your doctor may test your heart function with an echocardiogram or a MUGA scan.

Ramucirumab

In order for cancers to grow and spread, they need to create new blood vessels so that the tumors get blood and nutrients. One of the proteins that tells the body to make new blood vessels is called VEGF. VEGF binds to cell surface proteins called receptors to act. Ramucirumab (Cyramza™) is a monoclonal antibody that binds to a receptor for VEGF. This keeps VEGF from binding to the receptor and signaling the body to make more blood vessels. This can help slow or stop the growth and spread of cancer.

Ramucirumab is used to treat cancers that start at the gastroesophageal (GE) junction when they are advanced (the GE junction is the place where the stomach and esophagus meet). It is most often used after another drug stops working.

This drug is given as infusion into a vein (IV) every 2 weeks.

The most common side effects of this drug are high blood pressure, headache, and diarrhea. Rare but possibly serious side effects include blood clots, severe bleeding, holes forming in the stomach or intestines (called perforations), and problems with wound healing. If a hole forms in the stomach or intestine it can lead to severe infection and may require surgery to correct.

Endoscopic treatments for cancer of the esophagus

Several types of treatment for esophageal cancer can be done by passing an endoscope (a long, flexible tube) down the throat and into the esophagus. Some of these treatments may be used to try to cure very early stage cancers, or even to prevent them from developing by treating Barrett’s esophagus or dysplasia. Other treatments are used mainly to help relieve symptoms from more advanced esophageal cancers that can’t be removed.

Endoscopic mucosal resection

Endoscopic mucosal resection (EMR) is a technique where a piece of the inner lining of the esophagus is removed with instruments passed down the endoscope. EMR can be used for dysplasia (pre-cancer) and some small, very early-stage cancers of the esophagus.

After the abnormal tissue is removed, patients take drugs called *proton pump inhibitors* to suppress acid production in the stomach. This can help keep the disease from returning.

The most common side effect of EMR is bleeding in the esophagus, which is usually not serious. Less common but more serious side effects can include esophageal strictures (areas of narrowing) that might need to be treated by with dilation, and puncture (perforation) of the wall of the esophagus.

Photodynamic therapy

Photodynamic therapy (PDT) is a method that can be used to treat Barrett's esophagus, esophageal pre-cancers (dysplasia), and some very early stage esophageal cancers.

PDT is also often used to treat large cancers that are blocking the esophagus. In this situation, PDT is not meant to destroy all of the cancer, but to kill enough of the cancer to improve a person's ability to swallow.

For this technique, a light-activated drug called porfimer sodium (Photofrin®) is injected into a vein. Over the next couple of days, the drug is more likely to collect in cancer cells than in normal cells. A special type of laser light is then focused on the cancer through an endoscope. This light changes the drug into a new chemical that can kill the cancer cells. The dead cells may then be removed a few days later during an upper endoscopy. This process can be repeated if needed.

The advantage of PDT is that it can kill cancer cells with very little harm to normal cells. But because the chemical must be activated by light, it can only kill cancer cells near the inner surface of the esophagus – those that can be reached by the light. This light cannot reach cancers that have spread deeper into the esophagus or to other organs.

PDT can cause swelling in the esophagus for a few days, which may lead to some problems swallowing. Strictures (areas of extreme narrowing) can also occur in some patients. These often need to be treated by with dilation. Other possible side effects include bleeding or holes in the esophagus.

Some of this drug also collects in normal cells in the body, such as skin and eye cells. This can make you very sensitive to sunlight or strong indoor lights. Too much exposure can cause serious skin reactions, which is why doctors recommend staying out of any strong light for 4 to 6 weeks after the injection.

This treatment can cure some very early esophageal cancers that have not spread to deeper tissues. But this procedure destroys the tissue, so it can be hard to be certain that the cancer

hasn’t spread into deeper layers of the esophagus. Since the light used in PDT can only reach those cancer cells near the surface of the esophagus, cells of deeper cancers could be left behind, and grow into a new tumor. People getting this treatment need to have follow-up endoscopies to make sure the cancer hasn’t grown back. They also need to stay on a drug called a proton pump inhibitor to stop stomach acid production.

For more information on this technique, please see our document *Photodynamic Therapy*.

Radiofrequency ablation (RFA)

This procedure can be used to treat dysplasia in areas of Barrett’s esophagus. It may lower the chance of cancer developing in that area.

A balloon containing many small electrodes is passed into an area of Barrett’s esophagus through an endoscope. The balloon is then inflated so that the electrodes are in contact with the inner lining of the esophagus. Then an electrical current is passed through it, which kills the cells in the lining by heating them.

Over time, normal cells will grow in to replace the Barrett’s cells. The patient needs to stay on drugs to block stomach acid production after the procedure. Endoscopy (with biopsies) then is done periodically to watch for any further changes in the lining of the esophagus. Rarely, RFA can cause strictures (narrowing) or bleeding in the esophagus.

Laser ablation

This technique can be used to help open up the esophagus when it is blocked by an advanced cancer. This can help improve problems swallowing.

A laser beam is aimed at the cancer through the tip of an endoscope to destroy the cancerous tissue. The laser is called a *neodymium: yttrium-aluminum-garnet (Nd:YAG) laser*. Laser endoscopy can be helpful, but the cancer often grows back, so the procedure may need to be repeated every month or two.

Argon plasma coagulation

This technique is similar to laser ablation, but it uses argon gas and a high-voltage spark delivered through the tip of an endoscope. The spark causes the gas to reach very high temperatures, which can then be aimed at the tumor. This approach is used to help unblock the esophagus when the patient has trouble swallowing.

Electrocoagulation (electrofulguration)

For this treatment, a probe is passed down into the esophagus through an endoscope to burn the tumor off with electric current. In some cases, this treatment can help relieve esophageal blockage.

Esophageal stent

A stent is a device that, once in place, self-expands (opens up) to become a tube that helps hold the esophagus open. Stents are made of mesh material. Most often stents are made out of metal, but they can also be made out of plastic. Using endoscopy, a stent can be placed into the esophagus across the length of the tumor.

The success of the stent depends on the type of stent that is used and where it is placed. Stents will relieve trouble swallowing in most patients. They are often used after other endoscopic treatments to help keep the esophagus open.

Clinical trials for cancer of the esophagus

You may have had to make a lot of decisions since you've been told you have esophageal 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 esophageal 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 learn more about promising new treatments or procedures.

Clinical trials are one way to get state-of-the art cancer treatment. Sometimes they may be the only way to get 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.

If you would like to learn more about clinical trials that might be right for you, 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 studies 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 at 1-800-4-CANCER (1-800-422-6237) or by visiting the NCI clinical trials website at www.cancer.gov/clinicaltrials.

You must meet certain requirements to take part in any clinical trial. If you do meet those requirements, you decide whether or not to enter (enroll in) it.

You can get a lot more information on clinical trials in our document *Clinical Trials: What You Need to Know*.

Complementary and alternative therapies for cancer of the esophagus

When you have esophageal 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 might 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 might 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 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 read our document *Complementary and Alternative Methods and Cancer* to learn more about complementary and alternative methods.

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 cancer of the esophagus by stage

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

Stage 0

A stage 0 tumor is not true cancer. It contains abnormal cells called *high-grade dysplasia* and is really a type of pre-cancer. The abnormal cells look like cancer cells, but they are only found in the inner layer of cells lining the esophagus (the epithelium). They have not grown into deeper layers of the esophagus. This stage is often diagnosed when someone with Barrett's esophagus has a routine biopsy.

Options for treatment typically include endoscopic treatments such as photodynamic therapy (PDT), radiofrequency ablation (RFA), or endoscopic mucosal resection (EMR). Long-term follow-up with frequent upper endoscopy is very important after endoscopic treatment to continue to look for pre-cancer (or cancer) cells in the esophagus.

Another option is to have the abnormal part of the esophagus removed with an esophagectomy. This is a major operation, but one advantage of this approach is that it doesn't require lifelong follow-up with endoscopy.

Stage I

In this stage the cancer has grown into some of the deeper layers of the esophagus wall (past the innermost layer of cells) but has not reached the lymph nodes or other organs.

T1 cancers: Some very early stage I cancers that are only in a small area of the mucosa and haven't grown into the submucosa (T1a tumors) can be treated with EMR, usually followed by some type of endoscopic procedure to destroy any remaining abnormal areas in the esophagus lining.

But most patients with T1 cancers who are healthy enough have surgery (esophagectomy) to remove the part of their esophagus that contains the cancer. Chemotherapy and radiation therapy (chemoradiation) may be recommended after surgery if there are signs that all of the cancer may not have been removed.

T2 cancers: For patients with cancers that have invaded the muscularis propia (T2 tumors), treatment with chemoradiation is often given before surgery. Surgery alone may be an option for smaller tumors (less than 2 cm). If the cancer is in the part of the esophagus near the stomach, chemo without radiation may be given before surgery. The targeted drug trastuzumab (Herceptin) may be given with chemo if the cancer is HER2 positive and no radiation is given.

If the cancer is in the upper part of the esophagus (in the neck), chemoradiation may be recommended as the main treatment instead of surgery. For some patients, this may cure the cancer. Close follow-up with endoscopy is very important in looking for possible signs of cancer returning.

People with stage I cancers who can't have surgery because they have other serious health problems, or who don't want surgery, may be treated with EMR and endoscopic ablation, chemo, radiation therapy, or both together (chemoradiation).

Stages II and III

Stage II includes cancers that have grown into the main muscle layer of the esophagus or into the connective tissue on the outside of the esophagus. This stage also includes some cancers that have spread to 1 or 2 nearby lymph nodes.

Stage III includes some cancers that have grown through the wall of the esophagus to the outer layer, as well as cancers that have grown into nearby organs or tissues. It also includes most cancers that have spread to nearby lymph nodes.

For people who are healthy enough, treatment for these cancers is most often chemoradiation followed by surgery. Patients with adenocarcinoma at the place where the stomach and esophagus meet (the gastroesophageal junction) are sometimes treated with chemo (without radiation) followed by surgery. The targeted drug trastuzumab may be given with chemo if the cancer is HER2 positive and no radiation is given. Surgery alone may be an option for some small tumors.

If surgery is the first treatment, chemoradiation may be recommended afterward, especially if the cancer is an adenocarcinoma or if there are signs that some cancer may have been left behind.

In some instances (especially for cancers in the upper part of the esophagus), chemoradiation may be recommended as the main treatment instead of surgery. Patients who do not have surgery need close follow-up with endoscopy to look for possible signs of remaining cancer. Unfortunately, even when cancer cannot be seen, it can still be present below the inner lining of the esophagus, so close follow-up is very important.

Patients who cannot have surgery because they have other serious health problems are usually treated with chemoradiation.

Stage IV

Stage IV esophageal cancer has spread to distant lymph nodes or to other distant organs.

In general, these cancers are very hard to get rid of completely, so surgery to try to cure the cancer is usually not a good option. Treatment is used mainly to help keep the cancer under control for as long as possible and to relieve any symptoms it is causing.

Chemo may be given (possibly along with the targeted drug trastuzumab if the cancer is HER2 positive) to try to help patients feel better and live longer, but the benefit of giving chemo is not clear. Radiation therapy or other treatments may be used to help with pain or trouble swallowing.

For cancers that started at the gastroesophageal (GE) junction, treatment with the targeted drug ramucirumab (Cyramza) may be an option at some point. It can be given by itself or combined with chemo.

Some people prefer not to have treatments that have serious side effects and choose to receive only treatments that will help keep them comfortable and add to their quality of life. For more information on treatments that may be helpful, see the section "Palliative therapy for cancer of the esophagus."

Recurrent cancer of the esophagus

When a cancer comes back after treatment, it is called *recurrent* or *relapsed* cancer. Cancer that comes back in or near where it started is called a *local* recurrence. If it comes back in distant organs or tissues (such as the liver), it is called a *distant* recurrence. Treatment of recurrent esophageal cancer depends on where it comes back, as well as how it was treated the first time.

If the cancer was initially treated endoscopically (such as with endoscopic mucosal resection or photodynamic therapy), it most often comes back in the esophagus. This type of recurrence is often treated with surgery to remove the esophagus. If the patient isn't healthy enough for surgery, the cancer may be treated with chemotherapy, radiation, or both.

If cancer recurs locally (such as in nearby lymph nodes) after surgery to remove the esophagus, radiation and/or chemotherapy may be used. Radiation may not be an option if it was already given as part of the initial treatment. When chemotherapy was given before, it is usually still possible to give more chemotherapy. Sometimes the same drugs that were used before are given again, but often other drugs are used. Other treatment options for local recurrence after surgery might include more surgery or other treatments to help prevent or relieve symptoms.

If the cancer recurs locally after chemoradiation (without surgery), esophagectomy might be an option if a person is healthy enough. If surgery is not possible, treatment options might include chemotherapy or other treatments to help prevent or relieve symptoms.

Esophageal cancer that recurs in distant parts of the body is treated like a stage IV cancer (see “Treating cancer of the esophagus by stage” for more details). Palliative treatments (see next section) are used as needed. For more on dealing with a recurrence, you may also want to see our document *When Your Cancer Comes Back: Cancer Recurrence*.

Palliative therapy for cancer of the esophagus

Palliative therapy is treatment aimed at preventing or relieving symptoms instead of trying to cure the cancer. The main purpose of this type of treatment is to improve the patient’s comfort and quality of life.

Several types of treatment can be used to help prevent or relieve symptoms of esophageal cancer. In some cases, they are given along with other treatments that are intended to cure the cancer. In other cases, palliative treatments are given when a cure is not possible.

Esophageal dilation

This procedure is used to stretch out an area of the esophagus that is narrowed or blocked to allow better swallowing.

A small balloon-like device or a device shaped like a cylinder is passed down the throat and pushed through the narrowed area to stretch it out. This can be repeated if needed. Before the procedure, your doctor may give you a sedative to help you relax and may numb your throat by spraying it with a local anesthetic.

There is a small risk of bleeding or tearing a hole in the esophagus (called a *perforation*) with this procedure, which could require surgery or other treatments to fix. The esophagus typically stays open only a few weeks after dilation, so this is often followed by other treatments (such as placing a stent) to help keep the esophagus open.

Other endoscopic procedures

Several types of endoscopic procedures can be used to help keep the esophagus open in people who are having trouble swallowing. These techniques are described in more detail in the section, “Endoscopic treatments for cancer of the esophagus.” Procedures that may be used include:

- Esophageal stent placement
- Photodynamic therapy
- Electrocoagulation
- Laser ablation
- Argon plasma coagulation

Radiation therapy

External-beam radiation can often help relieve some of the symptoms from advanced esophageal cancer, including pain and problems swallowing. Radiation is often used for cancer that has spread to the brain or spine, but it is also useful in treating problems with swallowing from a narrowed or blocked esophagus.

If an area had been treated with external beam radiation therapy earlier, it may not be able to be treated that way again. In that case, brachytherapy may be an option. Brachytherapy is especially useful in helping to relieve a blocked esophagus. (See “Radiation therapy for cancer of the esophagus” for more details.)

Chemotherapy and targeted therapy

When used to help treat advanced esophageal cancer, chemotherapy and targeted therapy can both be considered a type of palliative therapy because they are intended to help slow the growth of the cancer and relieve symptoms from the cancer, as opposed to trying to cure it.

Pain management

Pain control is an important concern for people with cancer. There are many ways to treat cancer pain. People with cancer should let their cancer care team know right away if they are in pain. The cancer care team can provide medicines and other palliative treatments to relieve pain and other symptoms. Learn more about managing cancer-related pain in our document *Guide to Controlling Cancer Pain.*

Nutritional support

Nutrition is another concern for many patients with esophagus cancer. The cancer or its treatment might affect how you swallow and what you are able to eat. A team of doctors and nutritionists can work with you to provide nutritional supplements and information about your individual nutritional needs.

Some people having trouble swallowing and may need to have a feeding tube, usually called a *jejunostomy tube* (or J-tube), put into the first part of the small intestine. This is done through a small hole in the skin over the abdomen during a minor operation. A J-tube lets liquid nutrition be put directly into the small intestine to help prevent weight loss and improve nutrition. Less often, the tube is placed into the stomach instead. This is known as a *gastrostomy tube* or G-tube.

More treatment information about cancer of the esophagus

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 NCI, part of the US National Institutes of Health, provides treatment information by phone (1-800-4-CANCER) and on its website (www.cancer.gov). Detailed information intended for use by cancer care professionals is also available on www.cancer.gov.

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).

What should you ask your doctor about cancer of the esophagus?

It's important for you to have honest, open discussions with your cancer care team. Don't be afraid to ask any question, no matter how minor it might seem. Some questions to consider:

- What kind of esophageal cancer do I have?
- 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?
- Do I need to see other doctors?
- How much experience do you have treating this type of cancer?
- Should I get a second opinion? Can you recommend a doctor or cancer center?
- What are my treatment choices?
- What treatment(s) do you recommend and why?
- What is the goal of each treatment?
- What are the chances my cancer can be cured with these options?
- What risks or side effects should I expect? How long are they likely to last?
- Will treatment affect my ability to swallow or eat?
- Will treatment affect my voice?

- How soon do I need to start treatment?
- What should I do to be ready for treatment?
- How long will treatment last? What will it be like? Where will it be done?
- What would we do if the treatment doesn't work or if the cancer comes back?
- 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 you can plan your work or activity schedule. You might also want to ask about clinical trials for which you may qualify.

Keep in mind that doctors are not the only ones who can provide you with information. Other health care professionals, such as nurses and social workers, may have the answers to some of your questions. You can find more information about communicating with your health care team in our document *Talking With Your Doctor*.

What happens after treatment for cancer of the esophagus?

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

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

For other people, the esophagus cancer might never go away completely. These people may get regular treatments with chemotherapy, radiation therapy, or other therapies to help keep the cancer in check. 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's very important to go to all of your follow-up appointments. During these visits, your doctors will

ask about symptoms, examine you, and may order blood tests, upper endoscopy, or imaging tests such as upper gastrointestinal (GI) x-rays, barium swallows, or CT scans. These tests are described in the section “How is cancer of the esophagus diagnosed?”

Follow-up is needed to check for cancer recurrence or spread, as well as for possible side effects of certain treatments. This is the time for you to ask your health care team any questions you need answered and to discuss any concerns you might have.

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

It’s very important to report any new symptoms to the doctor right away, especially if they include trouble swallowing or chest pain. Early treatment can relieve many symptoms and improve your quality of life.

It’s also very 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.

If cancer does recur, treatment will depend on where the cancer is, what treatments you’ve had before, and your overall health. For more information on how recurrent cancer is treated, see the section “Recurrent cancer of the esophagus.” For more general information on dealing with a recurrence, you may also want to see our document *When Your Cancer Comes Back: Cancer Recurrence*.

Help for trouble swallowing, nutrition, and pain

Palliative treatments are aimed at helping to relieve the symptoms of esophagus cancer, rather than trying to cure the cancer. In some cases they are used along with other treatments that focus on curing the cancer, but palliative treatments are often used in people with advanced cancer to help improve their quality of life.

Cancer of the esophagus often causes trouble swallowing, which can lead to weight loss and weakness due to poor nutrition. A team of doctors and nutritionists can work with you to provide nutritional supplements and information about your individual nutritional needs. This can help you maintain your weight and nutritional intake. For more information and nutrition tips for during and after cancer treatment, see our document *Nutrition for the Person With Cancer During Treatment: A Guide for Patients and Families*.

There are many ways to control pain caused by cancer of the esophagus. If you have pain, tell your cancer care team right away, so they can give you prompt and effective pain management. For more information, see our document *Guide to Controlling Cancer Pain.*

For more information on palliative treatments, see the section “Palliative therapy for cancer of the esophagus.

Seeing a new doctor

At some point after your cancer diagnosis and treatment, you may find yourself seeing a new doctor who doesn't know anything about your medical history. It's important that you be able to give your new doctor the details of your diagnosis and treatment. Gathering these details during and soon after treatment may be easier than trying to get them at some point in the future. Make sure you have this information handy and always keep copies for yourself:

- 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 digitally (on a 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 the doctor prepared when you were 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
- The names and contact information of the doctors who treated your cancer

Lifestyle changes after cancer of the esophagus

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're 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 for information and support at 1-800-227-2345.

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 esophagus. The cancer or its treatment may affect how you swallow or cause 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. All of these things can be very frustrating.

During treatment: Many people lose weight or have taste problems during treatment. If this happens to you, do the best you can. Eat whatever appeals to you. Eat what you can, when you can. Now is not the time to restrict your diet. You may find it helps to eat small portions every 2 to 3 hours. Try to keep in mind that these problems usually improve over time. You may want to ask your cancer team about seeing a dietitian, an expert in nutrition who can give you ideas on how to fight some of the side effects of your treatment.

After treatment: Many patients have trouble with reflux after treatment. It may help to stay upright for several hours after eating.

In some patients, the stomach was used to replace all or part of the esophagus. This can mean that the stomach can't hold food for digestion like it did before. The food that is swallowed quickly passes into the intestine, leading to symptoms of diarrhea, sweating, and flushing after eating. This is called the *dumping syndrome*. This may mean you have to change your diet and how you eat. For example, you may need to eat smaller amounts of food more often.

Your health care team can help you adjust your diet if you are having problems eating.

One of the best things you can do after cancer treatment is to practice healthy eating habits. 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.

For more information, see 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 often 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's normal for your fitness, endurance, and muscle strength to decline. Any plan for physical activity should fit your own situation.

A person who has never exercised will not be able to take on the same amount of exercise as someone who plays tennis twice a week. If you haven't been active 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 activity 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 learn 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, please see *Fatigue in People With Cancer* and *Anemia in People With Cancer*.)

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

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

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

Can I lower the risk of my esophagus 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. Unfortunately, for most cancers there isn't much 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.

At this time, not enough is known about esophagus cancer to say for sure if there are things you can do that will be helpful. Tobacco and alcohol use have clearly been linked to esophagus cancer, so not smoking or drinking may help reduce your risk. We don't know for

certain if this will help, but we do know that it can help improve your appetite and overall health. It can also reduce the chance of developing other types of cancer. If you want to quit smoking and need help, call your American Cancer Society at 1-800-227-2345.

Adopting other healthy behaviors such as eating well, getting regular physical activity, and staying at 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.

Can I get another cancer after having esophagus cancer?

Cancer survivors can be affected by a number of health problems, but often their greatest concern is facing cancer again. If a cancer comes back after treatment it is called a "recurrence." But some cancer survivors may develop a new, unrelated cancer later. This is called a "second cancer." No matter what type of cancer you have had, it is still possible to get another (new) cancer, even after surviving the first.

Unfortunately, being treated for cancer doesn't mean you can't get another cancer. People who have had cancer can still get the same types of cancers that other people get. In fact, certain types of cancer and cancer treatments can be linked to a higher risk of certain second cancers.

Survivors of esophagus cancer can get any type of second cancer, but they have an increased risk of:

- Cancers of the mouth and throat
- Cancer of the larynx (voice box)
- Lung cancer
- Thyroid cancer
- Small intestine cancer

Men who were treated for esophagus cancer also have an increased risk of stomach cancer.

The most common risk factors for cancer of the esophagus are smoking and alcohol intake, which are also linked to many of these cancers.

Follow-up after treatment

After completing treatment of esophagus cancer, you should still see your doctor regularly. You may have tests to look for signs that the cancer has come back or spread. Experts do not recommend any additional testing to look for second cancers in patients without symptoms. Let your doctor know about any new symptoms or problems, because they could be caused by the cancer coming back or by a new disease or second cancer.

Survivors of colorectal cancer should follow the American Cancer Society guidelines for the early detection of cancer and stay away from tobacco products. Smoking increases the risk of many cancers and might further increase the risk of some of the second cancers seen in patients who have had esophagus cancer.

To help maintain good health, survivors should also:

- Achieve and maintain a healthy weight
- Adopt a physically active lifestyle
- Consume a healthy diet, with an emphasis on plant foods
- Limit consumption of alcohol to no more than 1 drink per day for women or 2 per day for men

These steps may also lower the risk of some cancers.

See *Second Cancers in Adults* for more information about causes of second cancers.

How might having esophagus cancer affect your emotional health?

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

You may find yourself thinking about death and dying. Or maybe you're more aware of the effect the cancer has on your family, friends, and career. You may take a new look at your relationships with those around you. Unexpected issues may also cause concern. For instance, you 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's 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 cancer of the esophagus stops working

If cancer keeps growing or comes back after one kind of treatment, it's possible that another treatment plan that might still cure the cancer, or at least keep it under control enough to help you live longer and feel better. Clinical trials also might offer chances to try newer treatments that could be helpful. But when a person has tried many different treatments and the cancer has not gotten any better, even newer treatments might no longer be helpful. If this happens, it's important to weigh the possible limited benefits of trying 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 treatments and nothing's working anymore. Your doctor might 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. Your doctor can estimate how likely it is the cancer will respond to treatment you're 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's important to have realistic expectations if you do choose this plan.

Palliative care

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 or other treatments might be used to help shrink a tumor and keep it from blocking the esophagus. But this is not the same as treatment to try to cure the cancer.

Hospice care

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's 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 the 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 *Hospice Care*.

Staying hopeful is important, too. Your hope for a cure may not be as bright, but there's 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.

To learn more

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

What's new in cancer of the esophagus research and treatment?

Research into the causes, prevention, and treatment of esophageal cancer is now being done at many medical centers, university hospitals, and other institutions around the world.

Genetics

Researchers have found that certain gene variants are more common in people with Barrett's esophagus. This may lead to new tests for finding the people who are likely to get Barrett's esophagus and esophageal cancer earlier, so that these problems can be prevented. Understanding these changes may also lead to new targeted therapies that overcome the effects of these abnormal genes.

Screening and prevention

The rate of adenocarcinoma of the esophagus has risen sharply in recent decades. Efforts are now being made to reduce obesity, a major risk factor for this form of cancer (and several other types as well).

In people with Barrett's esophagus, researchers are trying to determine if newer tests can tell which patients are likely to go on to develop cancer. This may help doctors determine which patients need intense follow-up and which ones can be examined less frequently.

Researchers are also looking for ways to help stop Barrett's cells from turning into pre-cancer or cancer. Drugs such as proton pump inhibitors and aspirin are now being studied for this purpose.

Treatment

Surgery

Doctors are using newer imaging tests and other tests to better determine which people are more likely to be helped by esophagectomy, and which people are less likely to benefit from this major operation.

Doctors are also constantly improving the surgery techniques used to treat esophageal cancer, aiming to make these operations safer and help patients recover from surgery more quickly.

Chemotherapy

Many studies are testing new ways to combine chemo drugs already known to be active against esophageal cancer to try to improve their effectiveness. Other studies are testing the best ways to combine chemotherapy with radiation therapy.

Researchers are also looking to see if they can examine the proteins inside esophageal cancer cells to tell whether or not the cancer is likely to respond to chemotherapy. This is important because many people get chemo and radiation as part of their initial treatment, often before surgery. Knowing if a person's cancer is likely to respond to chemo might help doctors choose the best treatment option for the person.

Targeted drugs

Targeted drugs, which attack certain substances in cancer cells, are useful in some other cancers and are now being tested in esophageal cancer. For example, the drug trastuzumab (Herceptin) interferes with a protein on esophageal cancer cells called HER2, which helps them grow and spread. Only a small portion of esophagus cancers (mostly adenocarcinomas) have too much of this protein, but this drug may help treat these cancers.

Many other targeted drugs are now being studied for use against esophagus cancer as well.

Additional resources for cancer of the esophagus

More information from your American Cancer Society

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

Dealing with diagnosis and treatment

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

Health Professionals Associated With Cancer Care

Talking With Your Doctor (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)

Living with cancer

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

Distress in People With Cancer

Guide to Controlling Cancer Pain (also in Spanish)

Anxiety, Fear, and Depression

Living With Uncertainty: The Fear of Cancer Recurrence

When Your Cancer Comes Back: Cancer Recurrence

Understanding cancer treatments

A Guide to Cancer Surgery (also in Spanish)

A Guide to Chemotherapy (also in Spanish)

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

Photodynamic therapy

Lasers in Cancer Treatment

Clinical Trials: What You Need to Know

Cancer treatment side effects

Nausea and Vomiting

Anemia in People With Cancer

Fatigue in People With Cancer

Peripheral Neuropathy Caused by Chemotherapy

Family and caregiver concerns

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

What It Takes to Be a Caregiver

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

Work, insurance, and finances

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

Working During Cancer Treatment

Returning to Work After Cancer Treatment

When treatment isn't working

When Cancer Doesn't Go Away

Nearing the End of Life

Hospice Care

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:*

Esophageal Cancer Awareness Association (ECAA)
Toll-free number: 1-800-601-0613
Website: www.ecaware.org

> Offers information from people who have or have had esophageal cancer on dealing with issues of diagnosis, treatment, and survival and support

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

> 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
Toll-free number: 1-888-650-9127
Website: www.canceradvocacy.org

> Has publications on many cancer-related topics; also offers the Cancer Survival Toolbox – a free program that teaches skills that can help people with cancer meet the challenges of their illness

**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.

References: Esophagus cancer detailed guide

American Cancer Society. *Cancer Facts & Figures 2015*. Atlanta, Ga: American Cancer Society; 2015.

American Joint Committee on Cancer. AJCC Cancer Staging Manual. 7th ed. New York, NY: Springer; 2010:103–111.

Burmeister BH, Smithers BM, Gebski V, et al. Surgery alone versus chemoradiotherapy followed by surgery for resectable cancer of the oesophagus: A randomised controlled phase III trial. *Lancet Oncol*. 2005;6:659–668.

Chak A, Chen Y, Vengoechea J, et al. Variation in age at cancer diagnosis in familial versus nonfamilial Barrett's esophagus. *Cancer Epidemiol Biomarkers Prev*. 2012;21:376–383.

Howlader N, Noone AM, Krapcho M, et al (eds). SEER Cancer Statistics Review, 1975-2010, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2010/, based on November 2012 SEER data submission, posted to the SEER web site, April 2013.

Kantor ED, Onstad L, Blount PL, Reid BJ, Vaughan TL. Use of statin medications and risk of esophageal adenocarcinoma in persons with Barrett's esophagus. *Cancer Epidemiol Biomarkers Prev*. 2012;21:456–461.

Kastelein F, Spaander MC, Biermann K, et al. Nonsteroidal anti-inflammatory drugs and statins have chemopreventative effects in patients with Barrett's esophagus. *Gastroenterology*. 2011;141:2000–2008.

Kleinberg L, Kelly R, Yang S, Wang JS, Forastiere AA. Chapter 74 – Cancer of the Esophagus. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa. Elsevier: 2014.

Kushi LH, Doyle C, McCullough M, et al. American Cancer Society Guidelines on nutrition and physical activity for cancer prevention: Reducing the risk of cancer with healthy food choices and physical activity. *CA Cancer J Clin*. 2012;62:30–67.

Lagergren J, Lagergren P. Recent developments in esophageal adenocarcinoma. *CA Cancer J Clin*. 2013;63:232–248.

National Cancer Institute. Physician Data Query (PDQ). Esophageal Cancer Treatment. 2013. Accessed at www.cancer.gov/cancertopics/pdq/treatment/esophageal/HealthProfessional on January 21, 2014.

National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Esophageal and Esophagogastric Junction Cancers. V.2.2013. Accessed at www.nccn.org/professionals/physician_gls/pdf/esophageal.pdf on January 21, 2014.

Nguyen DM, Richardson P, El-Serag HB. Medications (NSAIDs, statins, proton pump inhibitors) and the risk of esophageal adenocarcinoma in patients with Barrett's esophagus. *Gastroenterology*. 2010;138:2260–2266.

Oppedijk V, van der Gaast A, van Lanschot JJ, et al. Patterns of recurrence after surgery alone versus preoperative chemoradiotherapy and surgery in the CROSS trials. *J Clin Oncol*. 2014 Jan 13. [Epub ahead of print]

Posner MC, Minsky B, Ilson DH. Cancer of the esophagus. In: DeVita VT, Hellman S, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 9th ed. Philadelphia, Pa: Lippincott-Williams & Wilkins; 2011:887–923.

Shaheen NJ, Sharma P, Overholt BF, et al. Radiofrequency ablation in Barrett's esophagus with dysplasia. *N Engl J Med*. 2009;360:2277–2288.

Shan W, Lassen N, Johnson C, et al. A proprietary multianalyte test for predicting extreme resistance to neoadjuvant 5-FU based chemoradiation (CTRT) in esophageal adenocarcinoma (EC). *J Clin Oncol*. 2014 (suppl 3; abstr 51).

Spechler SJ. Barrett esophagus and risk of esophageal cancer: A clinical review. *JAMA*. 2013;310:627–636.

Stolzenberg-Solomon R, Fraumeni Jr. JF, Wideroff L, Albanes D, Curtis RE. New Malignancies Following Cancer of the Digestive Tract, Excluding Colorectal Cancer. In: Curtis RE, Freedman DM, Ron E, Ries LAG, Hacker DG, Edwards BK, Tucker MA, Fraumeni JF Jr. (eds). New Malignancies Among Cancer Survivors: SEER Cancer Registries, 1973-2000. National Cancer Institute. NIH Publ. No. 05-5302. Bethesda, MD, 2006. Accessed on 4/18/2014 at http://seer.cancer.gov/archive/publications/mpmono/MPMonograph_complete.pdf.

The Esophageal Adenocarcinoma Genetics Consortium; The Wellcome Trust Case Control Consortium 2, Su Z, Gay LJ, Strange A, et al. Common variants at the MHC locus and at chromosome 16q24.1 predispose to Barrett's esophagus. *Nat Genet*. 2012;44:1131–1136.

van Hagen P, Hulshof MC, van Lanschot JJ, et al. Preoperative chemoradiotherapy for esophageal or junctional cancer. *N Engl J Med*. 2012;366:2074–2084.

Wang KK, Sampliner RE; Practice Parameters Committee of the American College of Gastroenterology. Updated guidelines 2008 for the diagnosis, surveillance and therapy of Barrett's esophagus. *Am J Gastroenterol*. 2008;103:788–797.

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1-800-227-2345 or www.cancer.org