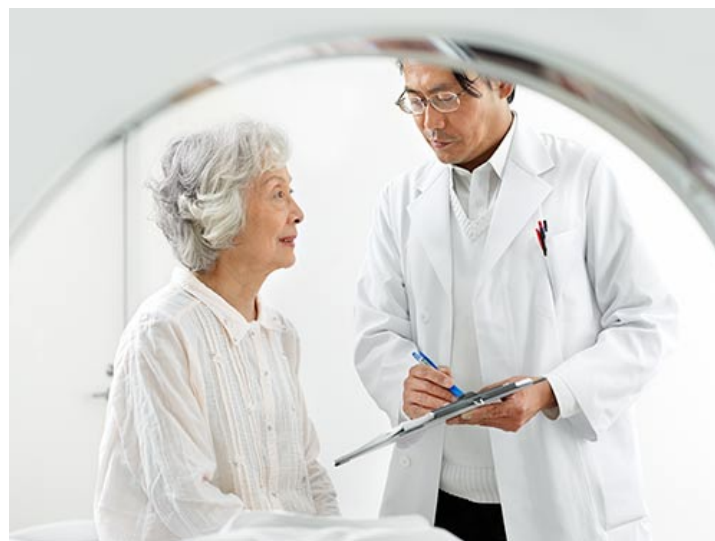




## Esophageal Cancer

Esophageal cancer occurs when cancer cells develop in the esophagus. The two main types are squamous cell carcinoma and adenocarcinoma. Esophageal cancer may not show symptoms in its early stages and is most often found in men over the age of 50.

Your doctor may perform a physical exam, chest x-ray, chest CT, Upper GI, esophagoscopy, endoscopic ultrasound, or PET/CT to help determine if you have cancer and if it has spread. A biopsy may be necessary to confirm the diagnosis of cancer. Treatment options depend on the extent of the disease and include surgery, radiation therapy and chemotherapy or a combination thereof.



- What is esophageal cancer?
- How is esophageal cancer diagnosed and evaluated?
- How is esophageal cancer treated?

## What is esophageal cancer?

Esophageal cancer occurs when cancer cells develop in the esophagus, a long, tube-like structure that connects the throat and the stomach. The esophagus carries swallowed food to the stomach and is part of the upper digestive system.

There are two main types of esophageal cancer:

- squamous cell carcinoma, in which cancer develops in the thin, flat (squamous) cells that form the inner lining of the esophagus.
- adenocarcinoma, in which cancer develops in glandular cells in the lining of the esophagus.

In the early stages of esophageal cancer, there may be no symptoms. In more advanced cancers, symptoms may include:

- difficulty or pain when swallowing

- weight loss
- chest pain
- coughing and regurgitation
- hoarseness
- vomiting blood
- tarry stool, or blood in stool
- indigestion and heartburn

Esophageal cancer is often not discovered until an advanced stage. It is more likely to happen in adults over the age of 50 and is twice as likely to occur in men. Esophageal cancer is the seventh most common cause of cancer death for men. Besides male gender and age, risk factors for esophageal cancer include:

- smoking
- heavy alcohol use
- gastroesophageal reflux disease (GERD), a condition in which the stomach contents back up into the lower section of the esophagus; this may irritate the esophagus and, over time, cause Barrett's esophagus, a condition in which the squamous cells lining the lower part of the esophagus have changed or been replaced with gland cells. Most people with Barrett's esophagus do not get esophageal cancer.
  - The affected gland cells in Barrett's esophagus can become increasingly abnormal and lead to a pre-cancerous condition called dysplasia. If dysplasia is present or if there is a family history of Barrett's esophagus, the risk of cancer is greater.

## How is esophageal cancer diagnosed and evaluated?

Your primary doctor will begin by asking you about your medical history, risk factors and symptoms. You will also undergo a physical exam.

Your doctor may have one or more of the following imaging tests performed to help determine if you have cancer and if it has spread:

**Chest x-ray:** This noninvasive medical test uses a very small dose of ionizing radiation to produce pictures of the inside of the chest, including the lungs, heart and chest wall.

**Computed Tomography (CT) - Chest:** Like traditional x-rays, this diagnostic medical test produces multiple images or pictures of the inside of the body. The cross-sectional images generated during a CT scan can be reformatted in multiple planes, and can even generate three-dimensional images. These images can be viewed on a computer monitor, printed on film or transferred to a CD or DVD.

**X-ray (Radiography) - Upper GI Tract:** Upper gastrointestinal tract radiography or upper GI uses a form of real-time x-ray called fluoroscopy and a barium-based contrast material to produce images of the esophagus, stomach and small intestine. The patient drinks a contrast material which coats the esophagus and stomach, and x-rays are taken. This procedure is also called an upper GI series. An upper GI examination that focuses on the esophagus is called a barium swallow or an esophagram.

**Esophagoscopy:** This procedure allows the physician to view the esophagus directly through an

esophagoscope, a thin, tube-like instrument with a light and a lens. The esophagoscope is inserted through the mouth or nose and down the throat into the esophagus. Some esophagoscopes are equipped with tools to remove tissue samples for inspection under a microscope for signs of cancer.

**Endoscopic ultrasound (EUS):** In this procedure, an endoscope, a thin, tube-like instrument with a light and a lens for viewing, is inserted through the mouth. A probe at the end of the endoscope is used to bounce high-energy sound waves (ultrasound) off internal tissues or organs to create echoes. The echoes form a picture of body tissues called a sonogram. This procedure is also called endosonography.

**Positron Emission Tomography/Computed Tomography (PET/CT):** PET uses small amounts of radioactive materials called radiotracers, a special camera and a computer to help evaluate your organ and tissue functions. By identifying body changes at the cellular level, PET may detect the early onset of disease before it is evident on other imaging tests. PET/CT can detect esophageal cancer, determine if it has spread, assess the effectiveness of a treatment plan and determine if the cancer has returned after treatment.

If these tests do not clearly show that an abnormality is benign, a biopsy may be necessary. A biopsy is the removal of tissue in order to examine it for disease. Biopsies are performed in several different ways. Some biopsies involve removing a small amount of tissue with a needle while others involve surgically removing an entire lump, or nodule, that is suspicious. A biopsy may be done simultaneously during an upper endoscopy that reveals the presence of Barrett's esophagus to rule out dysplasia and adenocarcinoma.

Your doctor will use these test results to help determine the presence and extent or stage of esophageal cancer.

If these tests are not suspicious for cancer, no further steps may be needed, although your doctor may want to monitor the area during future visits. Barrett's esophagus frequently requires six-month follow-up and/or monitoring via upper endoscopy to evaluate for progression to dysplasia.

## How is esophageal cancer treated?

Treatment for esophageal cancer may include surgery, radiation therapy, and chemotherapy. The optimal combination of these three treatment modalities will depend on the type, location and stage of the disease. When esophageal cancer is found very early there is a better chance of recovery. At later stages, esophageal cancer can be treated but rarely can be cured.

**Surgery:** Surgery is the most common treatment for cancer of the esophagus. It may be used alone for early stage disease or in combination with other therapies for advanced disease. If the cancer is a small tumor confined to the first layer of the lining of the esophagus, the surgeon may remove the tumor and a small amount of surrounding healthy tissue (called a margin). A procedure called a thoracoscopy — also known as minimally invasive surgical resection — that involves an incision between two ribs and insertion of a thoracoscope, a thin, tube-like instrument with a light and a lens for viewing, may be used to remove part of the esophagus or lung.

In more advanced cancers, part of the esophagus may be removed in an operation called an

esophagectomy. In an esophagectomy, the portion of the esophagus that contains the tumor is removed along with nearby lymph nodes and the remaining esophagus is re-connected to the stomach or part of the patient's gastrointestinal (GI) tract. In an esophagogastrectomy, the diseased part of the esophagus, nearby lymph nodes and part of the stomach are removed.

**Radiation therapy:** This treatment uses high-energy x-rays or other types of radiation to kill cancer cells. Radiation therapy is usually combined with chemotherapy and surgery for patients with esophageal cancer and is often used in patients who are not candidates for surgery. For patients undergoing surgical treatment for esophageal cancer, radiation therapy may be used before surgery to help shrink the cancer (called neoadjuvant treatment ) or after surgery, to destroy any remaining cancer cells (called adjuvant therapy). It may also be used to help manage the symptoms and complications of advanced disease, including pain and tumor growth that prohibits food from passing to the stomach. See the Introduction to Cancer Therapy (Radiation Oncology) page for more information.

**Chemotherapy:** This treatment uses chemical substances or drugs to kill cancer cells or stop them from dividing. Chemotherapy may be used before or after surgery for esophageal cancer and in combination with radiation therapy. Chemotherapy is also used to help relieve symptoms when esophageal cancer has spread (metastasized ) beyond the esophagus.

Other treatments for esophageal cancer include:

**Endoscopic treatments:** In these procedures, which are used to treat early and pre-cancers of the esophagus and for pain relief (called palliative treatment), an endoscope is inserted through the throat to the esophagus. Tools on the end of the instrument are then used to remove cancerous tissue.

**Monoclonal Antibody Therapy (also called targeted therapy):** A small number of esophageal cancers have too much of a protein called HER2 on the surface of their cells. A drug known as trastuzumab (Herceptin) is a monoclonal antibody that attaches to the HER2 protein on cancer cells and interferes with their ability to grow. This targeted therapy may be combined with chemotherapy.

**Immunotherapy:** This approach uses drugs to boost the patient's immune system to help control cancer. Some studies, but not all, have shown better survival rates when these drugs are given after surgery.

**Chemoprevention:** Drugs, vitamins and other agents are being studied in an effort to try and reduce the risk of cancer and/or delay its development or recurrence. For instance, non-steroidal anti-inflammatory drugs (NSAIDs), proton pump inhibitors and berries have been studied as chemopreventive agents to help prevent Barrett's esophagus from turning into cancer.

**Radiofrequency ablation:** Barrett's esophagus may be treated with radiofrequency ablation to check its progression to dysplasia and/or adenocarcinoma.

Since esophageal cancer can affect a person's ability to ingest food, additional treatments may be needed to ensure proper nutrition for the patient during and after treatment. Some patients may receive nutrients directly into a vein. Others may require a feeding tube—a flexible plastic tube that is passed through the nose or mouth into the stomach—until they are able to eat on their own.

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