Esophageal Cancer
What it is and how it is treated

This handout explains the symptoms of esophageal cancer, and how this type of cancer is diagnosed and treated. It includes details of what to expect before and after surgery to treat esophageal cancer.

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The Esophagus

The esophagus is a tube about 10 inches long. It runs from the throat to the stomach. It has many layers of tissues that work together to move food and liquids to the stomach.

Thin, flat squamous cells line the inside of the esophagus. More distally, the lining of the esophagus can be made up of epithelial cells. Under these cells are submucosal tissues, which keep the esophagus moist. Thick muscles underneath the submucosal tissues contract in waves to push food down the esophagus.

Types of Esophageal Cancer

Carcinoma is a cancer that starts in skin cells or in the tissues of body organs. Usually, esophageal cancer either occurs as carcinoma in the squamous cells or in the epithelial cells. Cancer that occurs in the squamous cells is called squamous cell carcinoma, and cancer in the epithelial cells is called adenocarcinoma.

Men over age 50 are at greatest risk for esophageal cancer. In the U.S., adenocarcinoma is more common than squamous cell carcinoma. The reverse is true in the rest of the world.

Adenocarcinoma tumors usually grow near the bottom of the esophagus, close to where the esophagus meets the stomach. Squamous cell cancer can grow anywhere in the esophagus, but it occurs most often in the upper and middle esophagus. Esophageal cancer is the 3rd most common cancer of the digestive tract, after colon and stomach cancer.
Esophageal cancer is hard to treat. Only 15% to 30% of patients (15 to 30 patients out of 100) survive 5 years or longer after their treatment. Patients who are treated soon after the cancer starts tend to do better. Esophageal cancer is usually treated with surgical resection (removing part of the esophagus) and chemotherapy and/or radiation therapy.

A common symptom of esophageal cancer is problems with swallowing. This includes painful swallowing (odynophagia) or difficulty swallowing (dysphagia). These can start as minor problems and get worse slowly. A person might start to eat softer foods or to chew food longer than usual and not be aware that their discomfort might be a sign of cancer. As symptoms get worse, the person might eat less and lose weight because of their discomfort. Anemia (low red blood cell count) might also occur.

Other possible symptoms of esophageal cancer are heartburn and indigestion, chronic cough, vomiting blood, pain behind the breastbone, and a hoarse or gravelly voice.

**Potential Complications**

These problems are linked to esophageal cancer:

- A growing tumor could make it harder to swallow over time. The tumor could also block the esophagus so that food has a hard time getting to the stomach. This often leads the person to eat less, which causes weight loss and related problems. If the tumor cannot be easily removed, your doctor might place a stent (tube) in your esophagus to hold it open.

- A tumor could create a hole called a fistula in your esophagus. Food and liquid could flow into your trachea (windpipe) through this hole. This would lead to coughing and aspiration pneumonia (when food or liquid goes into the lungs). If this happens, surgery is needed to close the fistula or to insert a stent.

- Esophageal tumors can also metastasize, or spread cancer to the other organs and tissues.

**What causes esophageal cancer?**

We do not know the exact causes of esophageal cancer. But, studies link the disease with these risk factors:

- Men are nearly 3 times more likely than women to develop esophageal cancer.
- The disease is 3 times higher among blacks than whites.
• The rate of esophageal cancer rises after age 50.
• Tobacco use (cigarettes, cigars, and chewing tobacco) and drinking alcohol often increase the risk of developing cancer, especially squamous cell carcinoma.
• Obesity is linked with adenocarcinoma because it is linked with gastroesophageal reflux (GERD).
• Barrett’s esophagus, a condition linked with long-term GERD, occurs when cells mutate (change) and become more like those in the stomach and intestine. Barrett’s esophagus is a major warning sign of adenocarcinoma.
• People who have had head or neck cancers, or who are infected with the human papillomavirus, are at greater risk of developing esophageal cancer.
• Injury to the esophagus, which can cause scarring and damage to the cells of the esophagus, is linked with higher risk of esophageal cancer.

How is esophageal cancer diagnosed?
When esophageal cancer is found early, it usually can be cured. But, by the time patients have difficulty swallowing, the cancer often is well-developed. This makes chances for a cure much smaller.

Based on a person’s symptoms of pain or difficulty swallowing, a doctor will do a physical exam, ask questions to get a detailed medical history, and learn about the patient’s possible risks, such as tobacco use or alcohol use. The exam might include these tests:
• Flexible endoscopy (see below and next page)
• Chest X-ray
• Blood tests
• Barium swallow (see next page)

Flexible Endoscopy
For this test, you will be sedated (given medicine to make you sleepy and relaxed). A tube called an endoscope is inserted into your mouth or nose and down into your esophagus. The endoscope has a light and a tiny camera on the end that takes close-up images of esophageal tissue. These images are projected onto a video monitor in the exam room.
Flexible endoscopy

An endoscopy gives the best information about the structure of your esophagus. It shows complications of reflux, such as esophagitis (irritation in the esophagus), so that they can be diagnosed. It also shows tissues that may have cancer. A tissue sample can be taken (biopsied) and examined in the lab to confirm whether cancer is present.

Barium Swallow

For this test, you will swallow a liquid that contains barium. As you swallow, your doctor will look through a fluoroscope. The fluoroscope lets your doctor see the fluid as it goes through your esophagus and into your stomach. These images are like X-rays. They will show how evenly the barium coats your esophagus. This information could help tell your doctor how severe your disease is.
If your doctor finds cancer or believes you may have cancer, you will likely have other tests that will give more information. These will help your doctor diagnose and treat you. These tests include:

- *Computed tomography* (CT) scans
- *Positron emission tomography* (PET) scans
- *Endoscopic ultrasound imaging*

All of these tests provide images of your esophagus, but in different ways. A *bronchoscopy* may also be done to learn whether cancer is also in your trachea.

**What treatments are there for this disease?**

We can treat esophageal cancer, but we may not be able to cure it. Some doctors believe that a 3-year survival after treatment may lead to a greater chance of long-term survival.

If your cancer is found and treated early, you will probably do better over time. But, the esophagus is a very wide tube, and a tumor may not be noticed until it is big enough to block food. A tumor this large is much more serious. By this time, cancer may also have spread to other body tissues, such as lymph nodes.

The type of treatment your doctor recommends will depend on:

- Where the tumor is located in the esophagus
- Whether the tumor has gone into nearby structures
- Whether cancer has spread to lymph nodes or other organs
- Your symptoms and overall health

**Types of Treatment**

- Usually, esophageal cancer is treated with an operation called an *esophagectomy*. In this surgery, part or all of your esophagus is removed. Different types of incisions used in esophagectomies are described on the next few pages.

- Radiation and chemotherapy are also used. Chemotherapy that is given before surgery may lead to a longer survival for patients who have cancer that can be operated on.

- *Radiofrequency ablation* is often used to treat people who have Barrett’s esophagus and pre-cancerous changes (*dysplasia*). It uses heat to destroy cancer cells. Barrett’s esophagus can develop from long-term GERD, and it leads to cancer in 1 out of 200 people who have it.
Esophagectomy Surgery

An esophagectomy is done to remove diseased portions of your esophagus, lymph nodes, and nearby soft tissues. There are many ways to do this surgery. The surgery method your doctor will use depends mainly on the location of your tumor.

Types of Incisions

Transhiatal Esophagectomy

In this operation, incisions are made in your neck and abdomen. Most of your esophagus is removed through these incisions. Not making an incision through your chest wall and not deflating your lung may result in fewer lung complications such as pneumonia.

Usually in this surgery, the stomach is attached to the esophagus in the neck. Sometimes, the colon is used instead of the stomach.
Ivor Lewis Esophagectomy
In this operation, surgery is done through 1 incision in your abdomen and 1 incision in your chest. The lower half of the esophagus is removed. The stomach is then attached to the upper esophagus in the chest.

Total Esophagectomy
This surgery is usually needed when there are large tumors in the middle of the esophagus. Incisions are made in 3 places: your abdomen, chest, and neck. Your esophagus is separated from other chest structures and organs through these incisions.

Minimally Invasive Surgery
When special tools are used, some of the surgical incisions may be 1 cm or less (less than ½ inch). This is minimally invasive surgery. It is called thoracoscopy when the incisions are in the chest and laparoscopy when they are in the abdomen. Most patients who have esophageal cancer are able to have minimally invasive esophageal surgery for their treatment at University of Washington Medical Center, where we specialize in these techniques.
In minimally invasive surgery, instead of doing open surgery through a large incision in the abdomen, about 5 small incisions are made. Each one is 5 mm to 10 mm long (less than ¼ inch to ½ inch). Your surgeon will insert tiny instruments and a fiber-optic camera through these incisions.

The benefits are that you will most likely have less pain, a faster recovery, and fewer problems with your incisions. Your surgeon will talk with you about this type of surgery and whether it is right for you.

**Surgery Risks**

A major complication that can occur with this surgery is leakage where the esophagus is cut and reattached.

Other less severe complications of this surgery are:

- *Atrial fibrillation* (irregular heartbeat)
- Pneumonia
- Lung collapse
- Bowel obstruction (blockage)
- Vocal cord paralysis and long-term hoarseness, if a nerve in 1 of your vocal cords is damaged during surgery

Risks of any surgery are:

- Bleeding
- Infection
- Adverse reactions to anesthesia

**What to Expect Before Your Surgery**

**First Clinic Visit**

When you see us in clinic before surgery, a resident doctor or fellow will ask about your medical history and do a brief physical exam. These doctors and your surgeon will look at the results of your tests and talk about your treatment. Your surgeon will then meet with you to talk about what treatment options are best for you.
Tests
You may have these tests before surgery:

- Barium swallow – to show images of your esophagus on X-ray (see page 5)
- Blood tests
- Electrocardiogram (ECG) – to measure your heart activity
- Pulmonary function tests – to measure the volume of air in your lungs when you breathe
- Computerized axial tomography (CAT) scan – an X-ray test that takes detailed pictures of your body
- Endoscopy – to look at the inside of your esophagus (see pages 4 and 5)
- Positron emission tomography (PET) scan – an X-ray test that will show any tumors (“hot spots”) in your cells

How to Prepare for Your Surgery

2 Weeks Before

- **Walk at least 1 mile every day** for 2 weeks before your surgery. This will help make your lungs strong and will help prevent pneumonia.

- **Use the incentive spirometer every day before your surgery.** This is a device you breathe into to exercise your lungs. You will be taught how to use it at your clinic visit before your surgery. It is important for you to do this. Using the incentive spirometer will help prevent pneumonia and other problems.

  To use the incentive spirometer, hold your mouth over the tube and inhale. Your breath will raise a small ball and exercise your lungs. Inhaling more deeply will make the ball stay up longer. Deep breaths exercise your lungs more than shallow breaths.

- You will have an appointment with our Pre-Anesthesia Clinic before your surgery. **They will review your regular medicines with you and tell you what medicines you should or should not take the day of your surgery.** If you are taking blood thinners (anticoagulants, such as Coumadin), aspirin, or Plavix, ask when you should stop these medicines before surgery.
1 Week Before

- For 1 week before your surgery, do **not** take aspirin, ibuprofen (Advil, Motrin) or naproxen (Aleve, Naprosyn) **unless** you are taking them for a specific medical condition. If you are unsure about whether or not to take these medicines, please call the clinic.

2 Days Before

- For 2 days before your surgery, do **not** shave any part of your body that you do not already shave every day. If you normally shave near your surgical site, stop shaving that area 2 days before your surgery.

The Day Before Surgery

- **Reminder Call:** A staff member from the Pre-Anesthesia Clinic will call you between 2 and 5 p.m. the day before your surgery. If your surgery is on a Monday, you will receive the call Friday afternoon.

  The Pre-Anesthesia staff person will remind you:
  - When to arrive at the hospital
  - Where to check in
  - What medicines you should or should not take on the day of your surgery

- **Fasting Guidelines:** Usually, you will be told **not** to eat or drink anything after midnight the night before your surgery. When the Pre-Anesthesia Clinic calls you the day before your surgery, they will tell you when to stop drinking fluids, based on the time of your surgery.

- **Showers:** Both the night before and the morning of surgery, shower or bathe using Chlorhexidine Gluconate soap:
  - Do **not** use this special soap on your face or hair. Use your regular soap and shampoo for these areas.
  - Wash thoroughly from the neck down, especially around the area of your surgery.

Day of Surgery

- Do **not** wear makeup, deodorant, lotions, hair products, or fragrances.
- Do **not** wear contact lenses. Wear your glasses instead.
- Remove all jewelry.
- Wear loose clothing that will be easy to take off and comfortable to wear home.
• **Arrive early.** Please leave home early and plan to arrive ahead of your scheduled check-in time. Allow for traffic and the chance that operations scheduled before yours end early.

• Bring these items with you on the day of surgery:
  - **List of your current medicines**, including their exact doses and when you last took them.
  - **Photo ID**
  - **Your insurance and pharmacy cards**
  - **Co-payments** for medicines
• If you have these items, also bring:
  - A copy of your **advance health care directive** and/or **durable power of attorney for health care**. They will be placed in your medical record.
  - Your **CPAP machine**, if you use it for sleep apnea.

**Arriving at the Hospital**
• You will check in and sign admission forms at your check-in location.

• Different members of your health care team will ask you your name, date of birth, and what procedure you will be having done. These questions are normally asked many times for your own safety.

• After you check into the hospital, you will be brought to the Pre-op holding area.

• You will be covered with a heating blanket to keep your body warm. Studies have shown that this will help reduce your risk of infection.

• You will have an **intravenous line** (IV) placed.

• You will receive an injection in your belly to prevent blood clots.

• You may have an epidural catheter placed in your back to help with pain control during and after the operation.

• When these steps are done and the operating room is ready, your anesthesia provider will transport you back to the operating room.

• After being brought to the operating room you will receive general anesthesia. This medicine will make you sleep.
What to Expect After Surgery

In the Recovery Room or ICU

You will wake up in the recovery room or in the ICU. Some patients go straight to the Intensive Care Unit after their operation.

When you wake up, you may have some or all of these devices:

- A **breathing tube** and **ventilator**. You may require sedation for the breathing tube and ventilator to remain in overnight, until your doctor is sure that you can breathe on your own. Fewer than 10% of patients (10 out of 100) need to have the tube and ventilator in overnight.

- An **epidural catheter**. Your anesthesia provider will place this small tube in your back before surgery. You will receive pain medicine through this catheter to numb the area where your incision will be made.

- A **nasal gastric (NG) tube** will be inserted through your nose into your stomach. This device keeps air out of your stomach. This helps keep you from throwing up, protects the new esophagus suture line and allows you to heal. This tube stays in place for 2 to 3 days.

- A **feeding tube** is placed into your intestines. This tube may be used to provide nutrition if needed. This tube stays in place for up to 6 weeks. It will be removed at a follow-up clinic visit.

- A **drain** in your neck which is placed around the suture line where your esophagus was connected to the stomach. This drain is usually removed 5 to 6 days after surgery.

- **Chest tubes** are rarely used by our surgeons. These tubes remove blood that collects inside your body after surgery. They also re-inflate your lungs. If they are used, they will be placed through your skin on both sides of your chest.

- An **oxygen mask** over your face to give you extra oxygen. You will be switched to nasal prongs (oxygen under your nose) when your lungs are ready.

- **Inflatable stockings** called **sequential compression devices (SCDs)** on your legs. These stockings squeeze your legs intermittently to improve blood flow. This helps keep blood clots from forming.

- A **urinary catheter** placed in your bladder. This allowed us to monitor your urine output during your surgery. It will stay in place for about 3 to 5 days so that we can monitor your urine output after surgery.
Pain Management
Nurses in the recovery room or ICU will monitor your pain level and give you medicine to make you comfortable.

Visitors
Your family may be able to visit you in the recovery room. This depends on your situation and the care of other patients in the recovery room.

Transfer to ICU
After about 2 hours in the recovery room, you will be transferred to an intensive care unit (ICU) for your first night after surgery. The ICU nurses will know what your recovery needs are.

Recovering in Your Hospital Room
After your night in the ICU and the doctors feel that you are ready, you will be transferred to a regular room in the hospital.

Pain Management
Your nurses, anesthesiologist, and doctor will work with you to make sure your pain is controlled. The medicine you receive through the epidural catheter will numb the area of your surgery. This will allow you to take deep breaths.

The epidural catheter will most likely be removed when you can start taking pain medication by mouth. As you recover, your pain will decrease.

Medicines
All of your medicines will be crushed or in liquid form.

Preventing Pneumonia
After surgery, you must exercise your lungs so that you do not get pneumonia. You will be taught several ways to help clear secretions (mucus) from your lungs.

• You will be given an **incentive spirometer** to help you exercise your lungs. Use this device the same way you did before surgery to avoid complications such as pneumonia. You will need to use your incentive spirometer 10 times or more every hour that you are awake.

• **Coughing and deep breathing** will also clear secretions. To help ease any pain that may occur with coughing and deep breathing, you will be taught to hug a pillow across your incision. Splinting your incision will help decrease your pain.
**Activity**
It is important for you to get up and walk as soon as you can after surgery. Your nurse will help you the first few times to make sure you are steady on your feet. **Please ask your nurse to help you. Do not wait to be asked if you need help.**

**Family and Friends**
Family and friends are very important to your recovery. Besides keeping you company, they can help keep you comfortable by fluffing your pillow, getting you a glass of water, or finding your remote control.

**Going Home**
If you live more than a 2-hour drive from the hospital, we recommend that you stay in the Seattle area an extra 5 to 7 days after you leave the hospital. This rest time will help your recovery. You will also be close by in case any problems develop.

**Medicines**
You cannot swallow whole pills for 4 weeks after your surgery. You will go home with liquid medicines or pills that can be crushed. This includes your pain medicine and anti-nausea medicine.

**Incision Care**
You incisions may have white pieces of tape (Steri-Strips) in place. They will fall off on their own in about a week.

**Showering**
- You may shower with the Steri-Strips in place. Just dab the Steri-Strips with a towel when you dry off.
- Do not take a bath, sit in a hot tub, or go swimming for 4 weeks after your surgery.

**Activity**
- Do not lift anything over 10 pounds for 6 weeks after your operation. This is about the weight of a gallon of water.
- Avoid activities that make you contract your abdominal muscles.
- It is important to walk. You should walk 3 to 4 times every day. Slowly increase how far you go.
Sexual Activity

- Avoid sexual activity for 2 weeks after your surgery.
- Once you resume sexual activity, continue to follow the other restrictions listed under “Activity.”

Driving

Do **not** drive for at least 4 weeks after your surgery. You should be off all of your pain medicine and you should be able to easily move and quickly apply brakes if needed before you resume driving.

Diet and Nutrition

- About 5 days after surgery, most patients are started on a clear liquid diet.
- You will progress to a soft diet for 6 weeks after your surgery. This diet will help keep food from getting stuck in the area where the surgery was done.
- If you have any questions about your diet, read the handout “Esophagectomy Diet” that your dietitian gave you before you left the hospital. Or, call your dietitian or your surgery team.

When to Call Your Surgeon

Call your surgeon if you have:

- A fever higher than 100.5°F (38°C)
- Shaking or chills
- Difficulty getting food or liquids down
- Nausea or vomiting that will not go away or is getting worse
- Abdominal or chest pain that is getting worse
- Any sign of infection in your incision:
  - Redness
  - Swelling
  - Foul-smelling drainage

If you call:

- Weekdays between 8 a.m. and 4 p.m.: Call the Surgical Specialties Nurse Advice Line at **206-598-4477**.
- After hours and on weekends and holidays: Call **206-598-6190** and ask for the resident on call for Surgery to be paged.
Follow-up Visits

Short-term Follow-up

You will need to come to the clinic for a follow-up visit 2 to 3 weeks after your surgery. When you get home, please call our Patient Care Coordinator at 206-598-4547 to schedule your appointment.

If you live more than 2 hours away, please ask your surgeon if you need to have this follow-up appointment.

Long-term Follow-up

You will need to come to the clinic again 6 months after your surgery. This visit is important to determine the success of your surgery and to see if you need any other treatment. Please call our Patient Care Coordinator at 206-598-4547 to schedule your 6-month follow-up visit.

Questions?

Your questions are important. Call your doctor or health care provider if you have questions or concerns.

Weekdays from 8 a.m. to 4 p.m., call the Center for Esophageal and Gastric Surgery at 206-598-4477.

After hours and on weekends and holidays, call 206-598-6190 and ask for the Resident on call for Surgery to be paged.