UW Medicine
UNIVERSITY OF WASHINGTON MEDICAL CENTER

Laparoscopic Assisted Esophagectomy

How to prepare and what to expect

Contents

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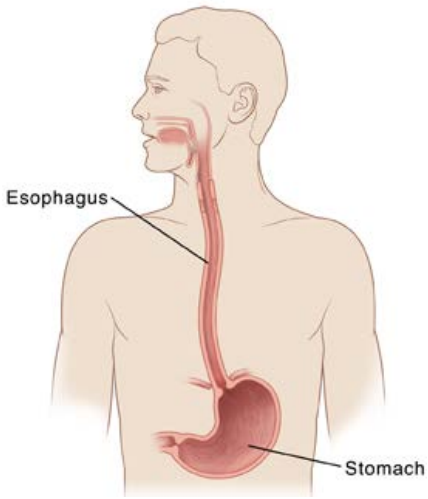


The esophagus carries food and liquid from your throat to your stomach.

The Esophagus

The *esophagus* is a tube that carries food and liquids from your throat to your stomach. Many layers of tissue work together to move food and liquids down the esophagus:

- Thin, flat *squamous* cells line the inside of the esophagus.
- Outside of the squamous cells are *epithelial* cells.
- Under the epithelial cells are *submucosal tissues*, which keep the esophagus moist.
- Thick muscles underneath the submucosal tissues contract in waves to push food down the esophagus.

Esophageal Cancer

Esophageal cancer is the 3rd most common cancer of the digestive tract, after colon and stomach cancer. Most times, esophageal cancer occurs as *carcinoma*. Carcinoma is a cancer that starts in skin cells or in the tissues of body organs.

Squamous Cell Carcinoma

Cancer that occurs in the squamous cells is called *squamous cell carcinoma*. This type of cancer can grow anywhere in the esophagus, but it occurs most often in the upper and middle esophagus.

Adenocarcinoma

Cancer in the epithelial cells is called *adenocarcinoma*. Adenocarcinoma tumors usually grow near the bottom of the esophagus, close to where the esophagus meets the stomach. In the U.S., adenocarcinoma is more common than squamous cell carcinoma. The reverse is true in the rest of the world.

Symptoms

People who have esophageal cancer often have problems swallowing. This includes painful swallowing (*odynophagia*) or difficulty swallowing (*dysphagia*). These can start as small problems and get worse slowly.

A person who has problems swallowing may not be aware that their problem could be a sign of cancer. They might start to eat softer foods or chew food longer than usual to avoid the symptoms. As symptoms get worse, they might eat less and lose weight because of their discomfort. This can lead to *anemia* (low red blood cell count).

Other possible symptoms of esophageal cancer are:

- Heartburn and indigestion
- Chronic cough
- Vomiting blood
- Pain behind the breastbone
- A hoarse or gravelly voice

Problems Linked to Esophageal Tumors

- 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 other 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 *metastasize*, spreading cancer to the other organs and tissues.

Causes

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.

Diagnosis

When esophageal cancer is found early, it usually can be cured. But by the time patients have problems swallowing, the cancer is often far along. 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, get a detailed medical history, and learn about the patient's possible risks, such as tobacco or alcohol use. The exam might include:

- **Chest X-ray**
- **Blood test**
- **Flexible endoscopy.** This procedure looks at the inside of your gastrointestinal (GI) track. For this test, you will have *sedation* (medicine to make you sleepy and relaxed). A tube called an *endoscope* will be inserted into your mouth 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.

  An endoscopy gives the best information about the structure of your esophagus. It shows problems caused by reflux, such as *esophagitis* (irritation in the esophagus). It also shows tissues that may have cancer. Your doctor can take a tissue sample (*biopsy*) and send it to the lab to be tested for cancer.
- **Barium swallow.** You will drink a cup of liquid (*barium*) while your doctor watches your throat and esophagus using a special X-ray machine called a *fluoroscope.* The fluoroscope lets your doctor see how evenly the barium coats your esophagus as it travels to your stomach. 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 help your doctor diagnose and treat you. These extra tests include:

- **Computed tomography (CT) scan.** A combination of X-rays and computer technology that takes detailed pictures of your body.
- **Positron emission tomography (PET) scan.** A small amount of radioactive *tracer* will be injected into your vein. The scan will show "hot spots" (problem areas).

- **Endoscopic ultrasound imaging (EUS).** A thin, flexible tube called an *endoscope* with a tiny ultrasound probe will enter through your mouth and be moved into your throat and esophagus. This will allow your doctor to see the structures of your GI tract.

All of these tests provide images of your esophagus, but in different ways. A *bronchoscopy* may be done to learn whether cancer is also in your *trachea* (windpipe). A bronchoscopy is a procedure that allows your doctor to see inside your airways.

Treatment Options

We can treat esophageal cancer, but we may not be able to cure it. It is usually treated with a combination of *surgical resection* (removing part of the esophagus), *chemotherapy*, and *radiation therapy*.

Some doctors believe that if a patient lives for 3 years after treatment, they have a good chance of long-term survival. About 15% to 30% of patients (15 to 30 patients out of 100) survive 5 years or longer after their treatment.

If your cancer is found and treated early, you will probably do better over time. But the esophagus is a very wide tube, and even with all of our testing, we may not see a tumor 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 types of treatment your doctor advises will depend on:

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

Here are the different types of treatment your doctor may suggest:

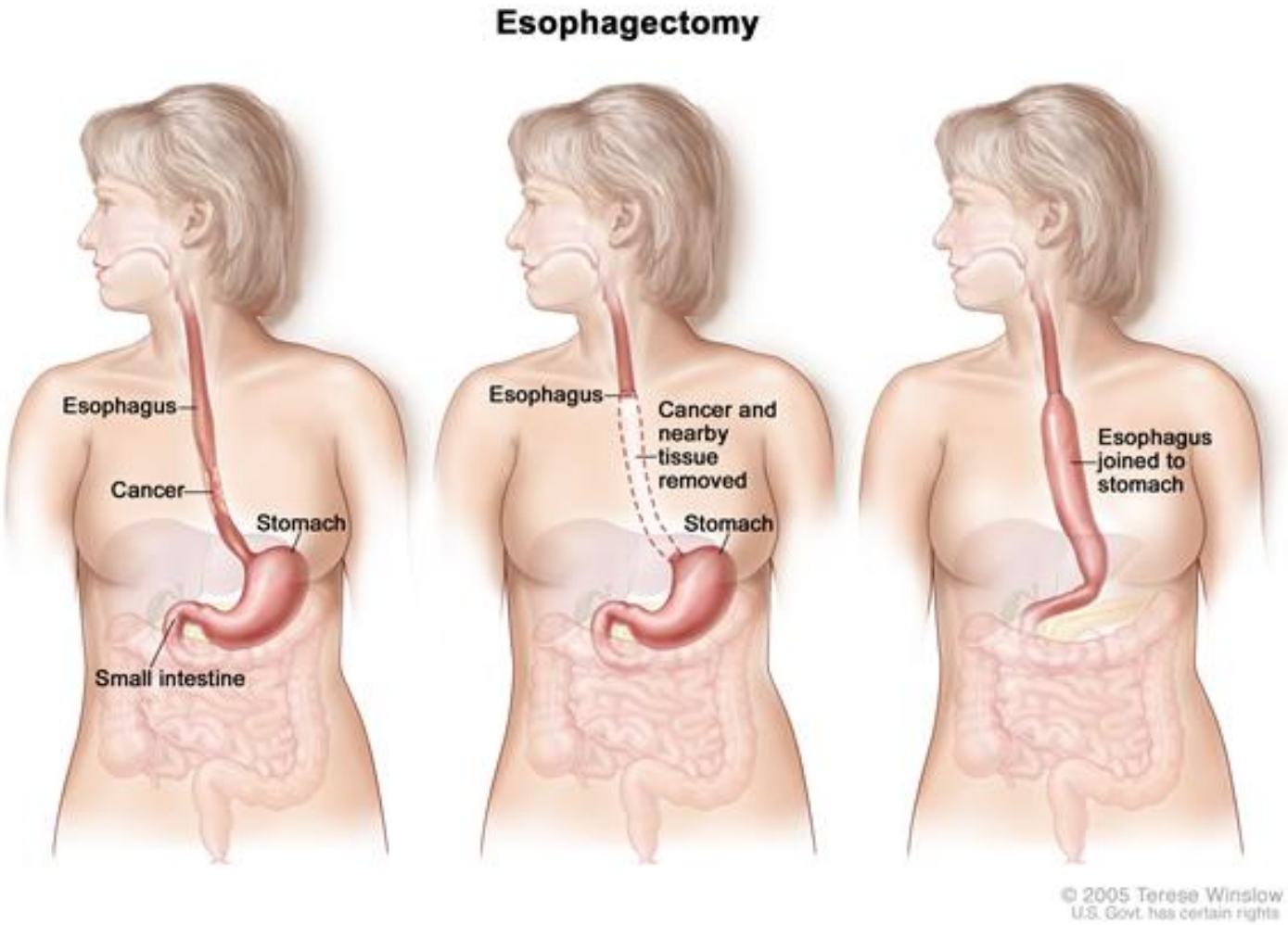
- **Esophagectomy.** In this surgery, part or all of your esophagus is removed.
- **Radiation and chemotherapy.** If a patient has cancer that will respond to surgery, chemotherapy drugs given before surgery may lead to a longer survival.
- **Radiofrequency ablation.** This treatment is often used for Barrett's esophagus and pre-cancerous changes (dysplasia). It uses heat to destroy cancer cells. Barrett's esophagus can develop from long-term GERD. It leads to cancer in 1 out of 200 people who have it.

Esophagectomy Surgery

Esophagectomy is surgery to remove part or all of the esophagus, lymph nodes, and nearby soft tissues. This is the most common procedure to treat esophageal cancer.

After diseased areas of the esophagus are removed, the stomach is pulled up into the chest or up to the neck to rebuild the esophagus. Sometimes, part of the large intestine is also used. Recovery takes 2 to 4 months.

This illustration shows how the cancer is removed and the stomach is moved up to meet the remaining part of the esophagus.



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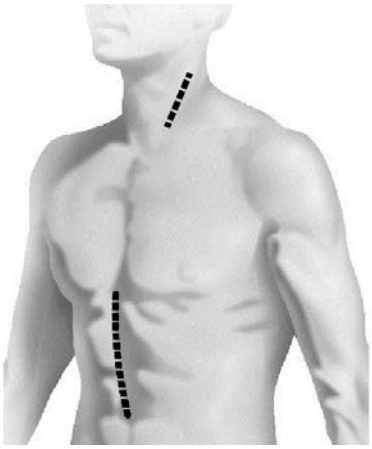
Open Surgeries

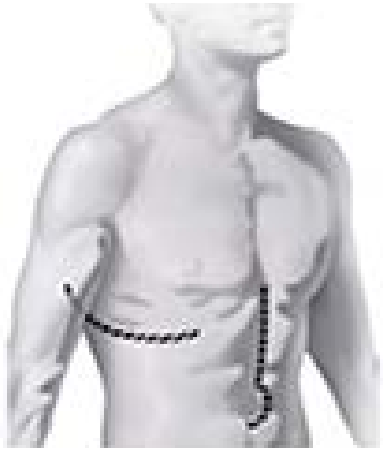
These drawings show the incisions used in 3 types of open surgery:



Transhiatal incisions

Transhiatal Esophagectomy

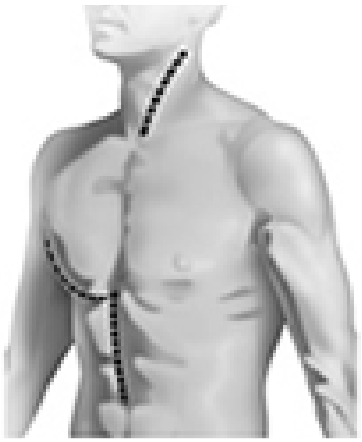
Incisions are made in your neck (*cervical*) and abdomen. The surgeon then removes the diseased part of esophagus. Usually in this surgery, the stomach is attached to the remaining part of the esophagus. There may be fewer lung problems such as pneumonia since there are no incisions in the chest wall and the lungs are not affected.



Ivor-Lewis incisions

Ivor-Lewis Esophagectomy

Incisions are made in the abdomen and in the chest. The surgeon then removes the diseased part of esophagus. A section of the stomach is pulled up into the chest and connected to the remaining healthy esophagus. This forms a new esophagus.



Total esophagectomy incisions

Total Esophagectomy

This method is often needed when there is a large tumor in the middle of the esophagus. Incisions are made in 3 places: the abdomen, chest, and neck. The esophagus is separated from other chest structures and organs through these incisions. It is then removed. The stomach is connected to a small piece of the esophagus that remains in the neck.

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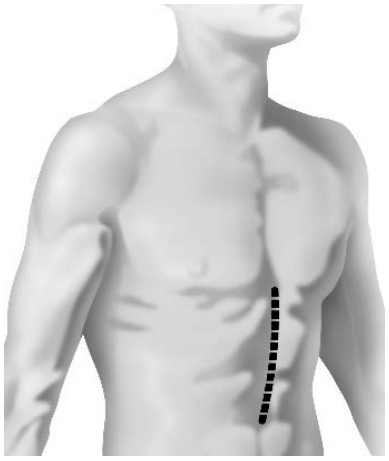
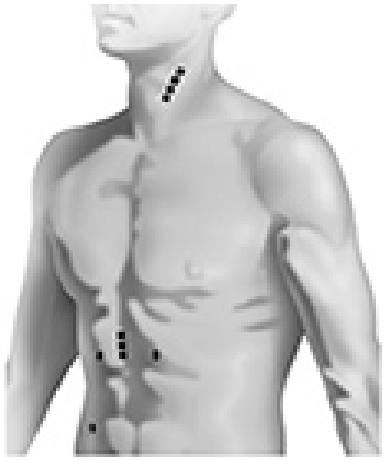
Laparoscopic Surgery

Laparoscopic surgery is a type of *minimally invasive* surgery because it makes smaller incisions. The surgeon makes about 5 small incisions, each one less than 1cm long. Special surgical instruments and a fiber-optic camera are inserted through theses incisions to do the esophagectomy.

These drawings show the difference between the incisions used in open surgery and the ones used in laparoscopic surgery.



In open surgery, the surgeon makes long incisions.



In laparoscopic surgery, the surgeon makes several tiny incisions.

Surgeons at University of Washington Medical Center (UWMC) are experts in minimally invasive surgery. Compared to open surgery, laparoscopic surgery may decrease pain, speed your recovery, and allow you to go home sooner from the hospital.

Your surgeon will tell you if laparoscopic surgery is right for you. It may not be the best option for every patient.

Risks

There are risks involved in any surgery. With an esophagectomy, these problems may occur in the first week, while you are still in the hospital:

- Leakage where the esophagus was cut and treated
- Lung collapse
- Bowel blockage
- Vocal cord paralysis and long-term hoarseness
- Infection
- Bleeding

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How to Prepare

- To prepare your lungs for surgery and to prevent pneumonia:
  - Walk an extra mile a day for 2 weeks before your surgery.
  - Use an *incentive spirometer* to exercise your lungs. We will give you this device and show you how to use it at your clinic visit before your surgery. Use your spirometer every day before your operation. Do 3 sets of 10 breaths every day.
- If you are a smoker, you should stop smoking several weeks before surgery. If you have trouble quitting, talk with your doctor about medicines or other methods that can help you quit.
- You will go home 7 to 10 days after surgery. Plan to have a responsible adult pick you up from the hospital and help you at home for the first week or longer as you recover.
- Tell your clinic nurse if you have any special needs. Ask to talk with a social worker about any special needs that you may have before or after your surgery.

What to Expect After Your Operation

You will wake up in the recovery room or in the Intensive Care Unit (ICU). When you wake up, you will have several devices attached to you. You may have some or all of these devices:

- A **breathing tube and ventilator** (breathing machine) to help you breath. You may need sedation if the breathing tube and ventilator have to stay in overnight. They will be removed when your doctor is sure that you can breathe on your own.
- An **oxygen mask** to give you extra oxygen. This will be changed to *nasal cannula* (nasal prongs) when your lungs are ready.
- An **intravenous** (**IV) tube** to give you fluids and medicines during and after surgery.
- An **epidural catheter** for pain control. This will be placed into your spine by your anesthesiologist before surgery. The medicine you receive through the epidural catheter will numb the area of surgery.
- A **nasal gastric tube (NG tube),** placed through your nose into your stomach. This keeps air out of the stomach to prevent from vomiting, and protects your surgical stitches. This tube will stay in place for at least 3 days.
- A **jejunostomy tube (J-tube)** to provide nutrition while you are recovering from surgery. This is placed in your intestine and can stay in place for up to 90 days. It will be removed at a clinic visit when your doctor believes you can eat on your own.

- A **Jackson-Pratt drain (JP drain)** to drain excess fluids. This drain will be near your incision site where your esophagus was connected to the stomach. It is usually removed by day 6 after surgery.
- **Chest tube** to remove old blood from surgery and to re-inflate your lungs. This may be placed through your skin on your chest. This will be hooked up to suction This will be removed 2 to 3 days after your surgery, depending on your recovery.
- A **urinary catheter** to help nurses measure your urine output during and after surgery. This catheter will be in place for at least 2 days after surgery.
- **Sequential compression device (SCDs)** on your legs. These wraps inflate from time to time to help with blood flow and prevent blood clots.

Recovering in Your Hospital Room

You will spend 1 or more nights in the surgical ICU so that nurses can watch you closely. After that, you will transfer to another unit in the hospital where nurses care for patients who have had surgery.

Pain Control

- You will continue to receive pain medicine through an epidural catheter.
- You will also have a device called *patient-controlled analgesia* (PCA). When you push the PCA button, a pump delivers pain medicine into your IV. This allows you to control the amount of pain medicine you get after surgery.
- You will be started on pain pills when you are getting closer to going home.
- A team of nurses, anesthesiologist, doctors and you will work together to make sure your pain is controlled. Be sure to tell your nurse or doctor if pain is not under control.

Breathing Exercises

Use your incentive spirometer to help strengthen your lungs and to prevent lung infection and other problems after surgery.

To use the incentive spirometer:

- Place the mouthpiece in your mouth and seal your lips around it. Slowly inhale. Your breath will raise a small ball.

- Inhaling more deeply will make the ball stay up longer. Try to get the ball as high as you can, exhale slowly through your mouth.
- Rest for few seconds. Repeat these steps 10 times every hour while you are awake.
- After you are done with your set of 10 deep breaths, cough to clear your lungs. You can hold or hug a pillow across your incision sites when you cough to ease the pain.
- If you feel dizzy at any time, stop and rest.

Diet and Nutrition

- You will not be able to eat or drink for a few days after surgery. You will have a follow-up test after surgery to make sure there is no leakage around your connection site. When you are able, you will start with ice chips and slowly advance to a full liquid diet.
- You will meet with a dietitian the day after surgery to talk about your nutritional needs.
- You will be started on a tube feeding about 3 days after surgery.

Self-care After Surgery

Going Home

If you live more than a 2-hour drive from the hospital, we advise you stay in the Seattle area for 5 to 7 days after leaving the hospital. This rest time will help with recovery, and the hospital will be close in case you have any problems.

Driving

- Do **not** drive for at least 2 weeks after surgery.
- Do **not** drive as long as you are taking prescription pain medicine (opioids). These medicines affect your judgment and your reaction time.
- Once you are no longer taking opioids, you may begin driving when you feel your reaction time is normal.

Medicines

- A pharmacist will review your medicines with you before you leave the hospital.
- You cannot swallow whole pills for 4 to 6 weeks after surgery. All of your medicine must be crushed or in a liquid form. Call the pharmacy if you have questions about crushing any of your pills.

- If your doctor prescribed an antibiotic, do not stop taking it unless your provider tells you to stop. It is important to take all of the antibiotics as prescribed.

Pain Control

- **Remember, all of your medicines must be crushed or in a liquid form.**
- You may have some pain or soreness around your surgical sites. We suggest you take Tylenol (acetaminophen) around the clock for pain. Do **NOT** take more than 4,000 mg in 24 hours.
- Cold packs on your incisions can help ease pain. If you use ice, do not place it directly on your skin. Wrap the ice in a towel first. Apply ice for 20 minutes at a time, then remove for 20 minutes.
- You will receive a prescription medicine (opioids) to help with moderate to severe pain. Use this medicine **only** if acetaminophen or ibuprofen do not control your pain.
- If you need a refill for opioids, you will need to come to the hospital to pick up a prescription. Or, call us in advance so that we can mail you a prescription. We cannot send a prescription for opioids directly to your pharmacy. You must take it there in person.
- Some pain medicines can make you dizzy. Ask for help when you get out of bed or a chair to keep from falling.
- If you have nausea after taking pain medicine, try taking it with food or milk.
- Some prescription pain medicines (and the anesthesia you received for your surgery) can cause constipation (hard stool). Drink plenty of fluids and take the prescribed laxative to avoid constipation while taking pain medicines. Stop taking laxative if you have loose stools.
- You may also have shoulder pain for the first few days after your surgery. This is caused by the gas (carbon dioxide) that was used to inflate your abdomen during surgery. This pain usually lasts about 4 to 5 days. Opioids do not ease this shoulder pain. We advise walking, massaging the area, or using heating pads if this pain bothers you.

Diet and Nutrition

- You will be on a soft esophageal diet for about 4 to 6 weeks after surgery. This diet will help keep foods from getting stuck in the area where the surgery was done.
- Eat 5 to 6 small meals a day instead of 3 large meals. Take small bites, chew them well, and eat slowly. Stop when you are full.

- Your nutrition will be supplemented with tube feeds to make sure you get enough calories to help you maintain your weight.
- Keep tube feeding until your care team says it is OK to stop. A dietitian will call you while you are on tube feeds to check your progress.
- After about 6 weeks, you will progress to a regular diet.

If you have any questions about your diet, read the handout "Esophagectomy Diet," or call your dietitian or clinic nurse.

Activity

- For 6 weeks, do **not** lift anything that weighs more than 15 pounds. (A gallon of water weighs almost 9 pounds).
- As you heal, slowly increase your activity.
- It is important for you to walk as soon as you can after surgery. Walk at least 3 times a day, for a total of at least 1 mile. Spread your walks out over the course of the day. Slowly increase the distance you walk. Be sure to rest if you feel tired.
- Avoid activities that make you contract your abdominal muscles.
- Keep using the incentive spirometer, coughing, and doing deep breathing exercises at home until you are back to your normal activity pattern. Deep breathing exercise will improve your lung function and help prevent problems such as pneumonia.

Dressing and Wound Care

- You will have white strips of tape called Steri-strips over your incisions. Do **not** take them off. They will fall off in 1 or 2 weeks.
- Check your incision daily for any changes. Watch for signs and symptoms of infection such as:
  - Increased pain
  - Redness
  - Swelling
  - Drainage that increases or smells bad
- Your incisions will heal best if you keep them uncovered.
- Do **not** use any creams or lotions on your incisions while they are healing.
- You may go home with JP (Jackson-Pratt) drain (see page 10). You will receive teaching on how to measure the output of body fluids. You will do this every day and tell your surgical team when the output is less than 30 mL for 3 days in a row.

Showering

- It is OK to shower and get the Steri-strips wet.
- After showering, gently pat the Steri-strips dry. Do **not** rub them.
- Do **not** take a bath, go swimming, sit in a hot tub, or soak your incisions for 2 weeks after your surgery and until the incisions are fully healed.

Follow-Up Care

You will need to come to the clinic for checkups after your surgery.

- At 2 to 3 weeks, you will see the surgery team and dietitian.
- At 4 to 6 weeks, you will see the surgery team and dietitian.
- At 6 months, your surgery team will assess the success of your surgery and if you need any other treatment.

Your medical oncologist will decide your follow-up needs and talk with us if any problems arise.

When to Call Your Doctor

Call your surgical team if you have any of these symptoms in the first 7 days after your surgery:

- Cannot swallow foods or can handle only liquids
- Cannot keep fluids down
- Vomiting even if you are taking medicines to prevent nausea
- Your vomit is green, bloody, or looks like coffee grounds
- Chest pain or shortness of breath when you are not active
- Severe, ongoing pain that is not relieved by pain medicine and rest
- Back or shoulder pain that does not go away
- Ongoing weight loss
- You feel very full and your abdomen is distended
- You cannot have a bowel movement
- You have diarrhea
- Your stools look black or tarry
- You feel dizzy or faint when you stand up
- New or increased weakness, numbness, or tingling

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- One of your legs or arms is warm, tender, painful, swollen, or red
- Increased bleeding from your incisions
- Any sign of infection around your incisions:
  - Fever higher than 100.5°F (37.8°C)
  - Shaking or chills
  - Bleeding from your incisions
  - Increase in drainage
  - Drainage that is thick or smells bad
  - Redness or swelling
  - Growing pain or tenderness at or spreading away from the incision sites

Questions?

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

Weekdays from 8 a.m. to 5 p.m., call 206.598.4477 and press 8 when you hear the recording.

After hours and on weekends and holidays, call 206.598.6190 and ask to page the “Surgery O team.”

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