Surgery of the Esophagus

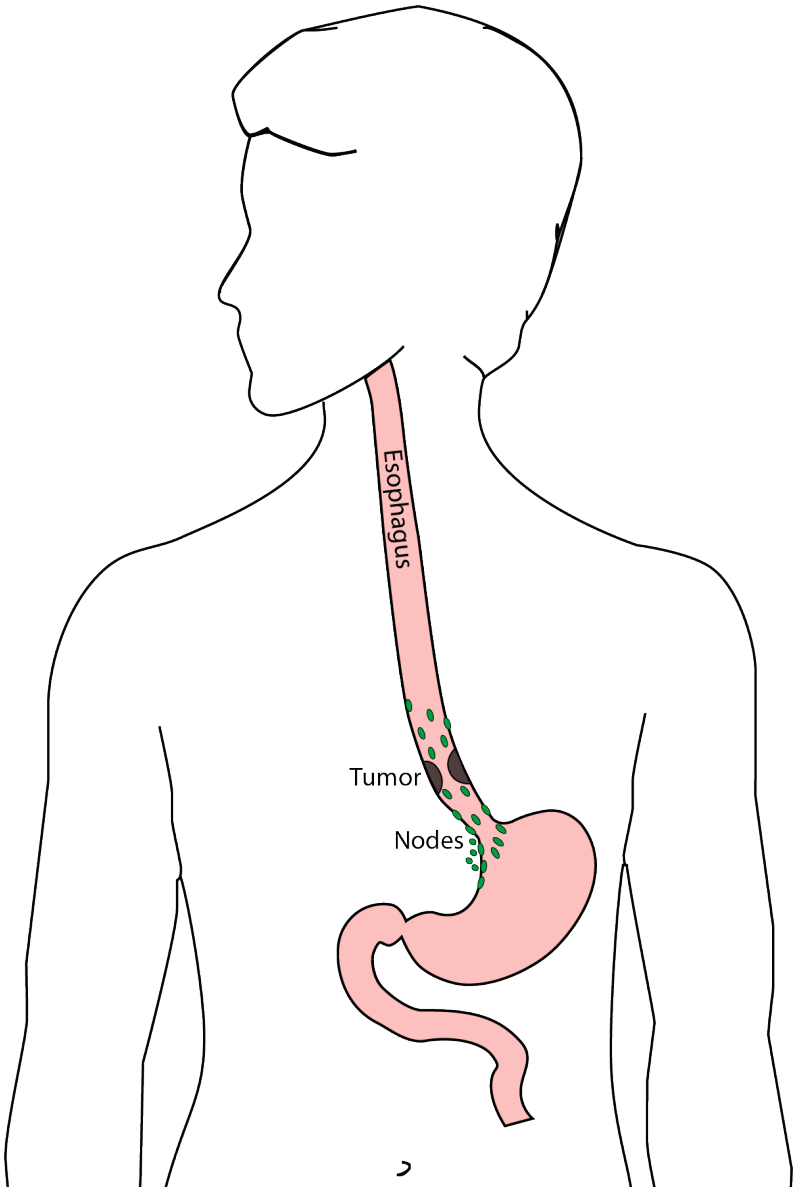
Surgery for Esophageal Cancer

Surgery for esophageal cancer is generally performed in several situations:

- Superficial Tumors (T1) that can't be completely removed by endoscopy
- Localized Tumors (T2N0)
- Locally Advanced Tumors (T3 or N+) after preoperative therapy.

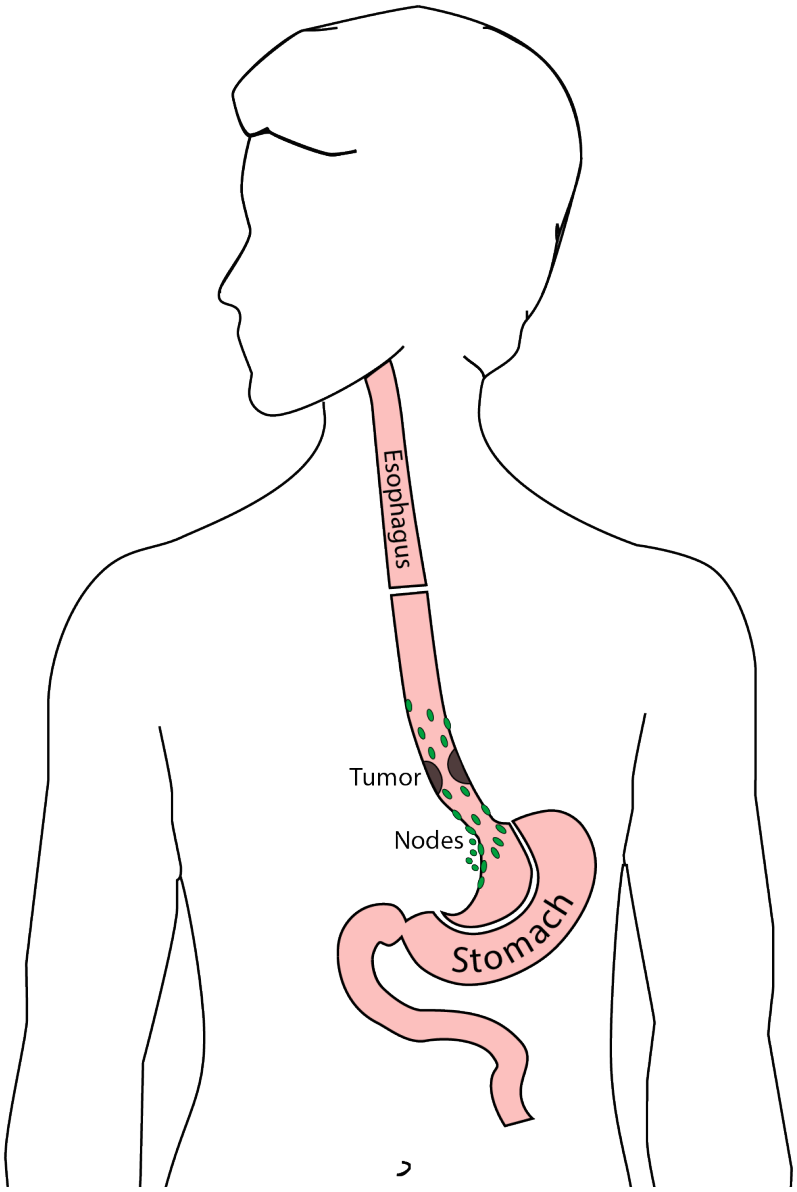
Goals of Surgery

- Remove tumor from esophagus
- Remove surrounding lymph nodes
- Create a new esophagus



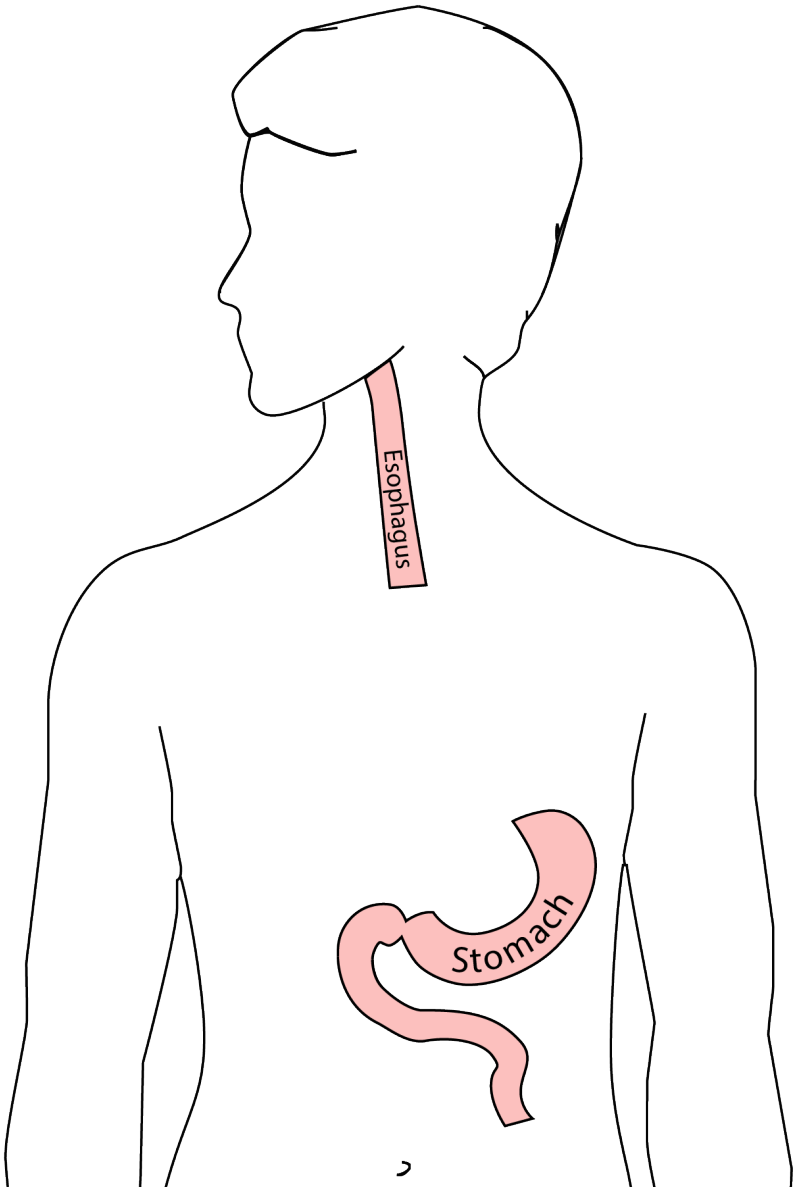
Resection

The *Ivor Lewis* esophagectomy, shown here, removes the lower 2/3 of the esophagus, the tumor, and the surrounding lymph nodes.



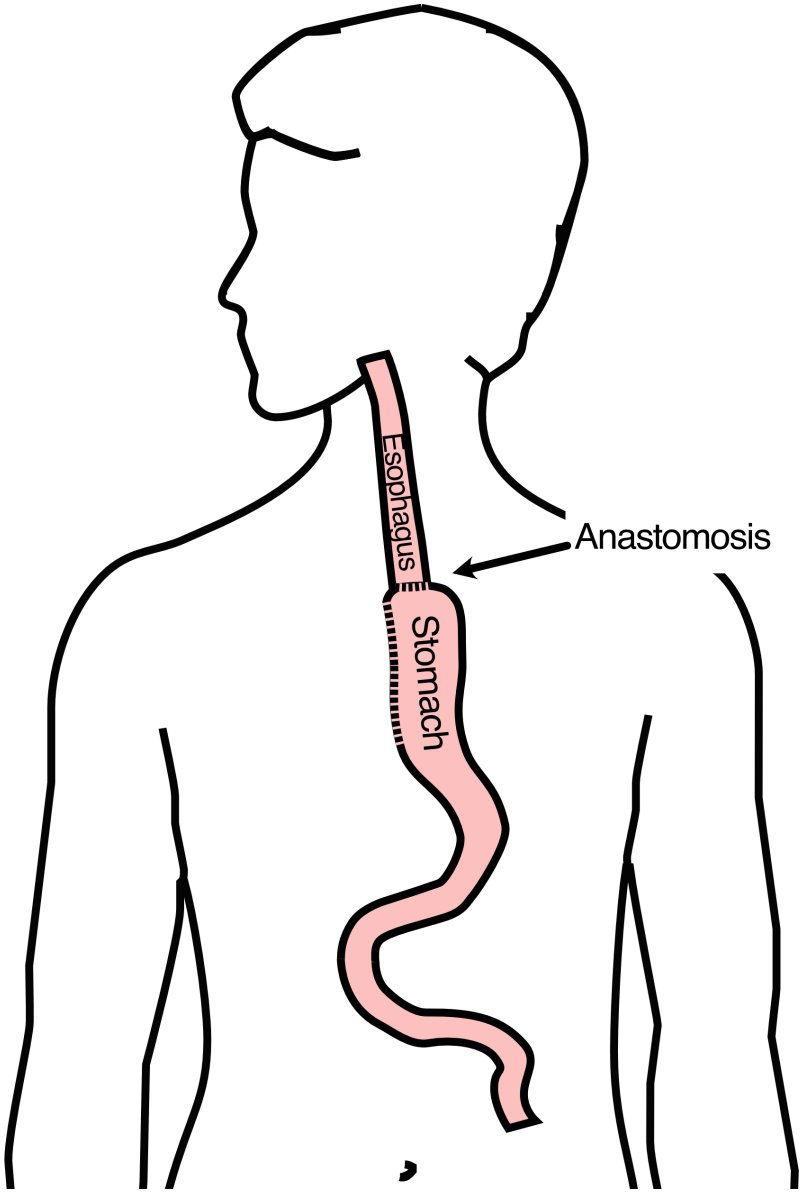
Reconstruction

A new esophagus is created from the stomach in the abdomen by fashioning it into a tube.



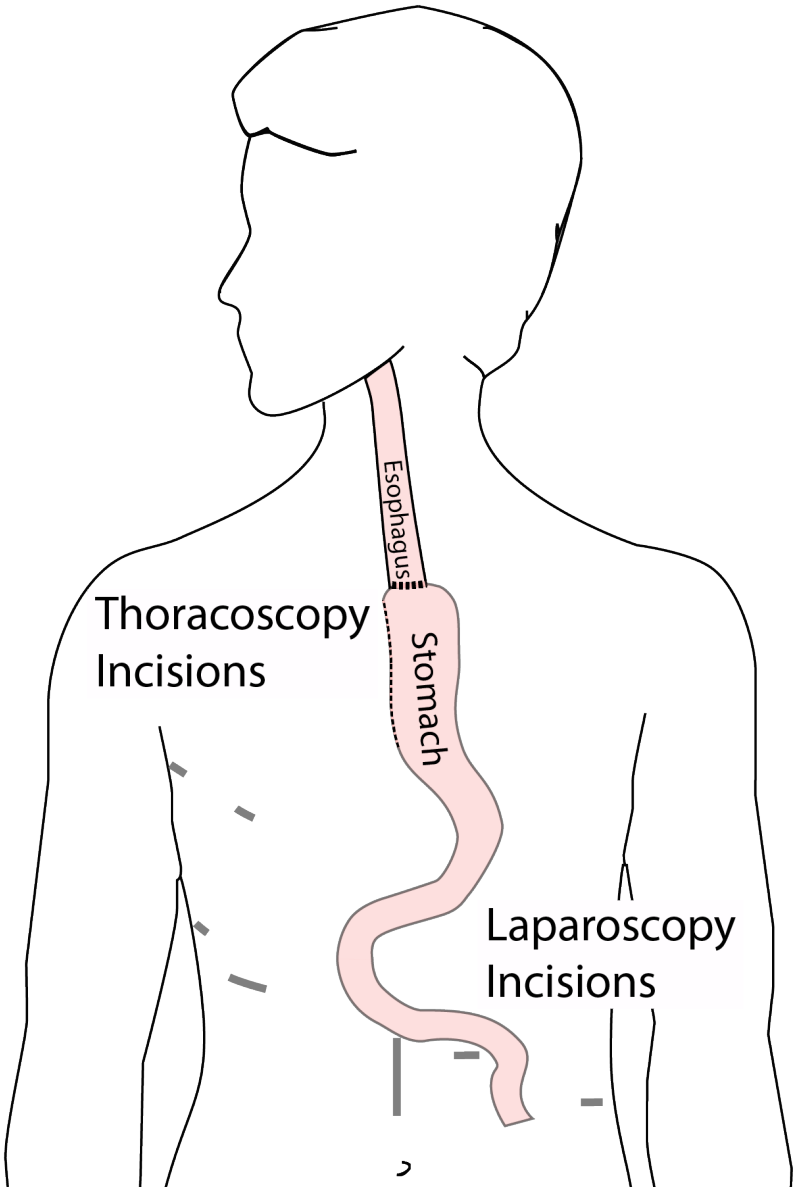
Ivor Lewis esophagectomy

The new esophagus is now brought up into the chest. A new connection is made between the esophagus and the stomach, called an *anastomosis*.



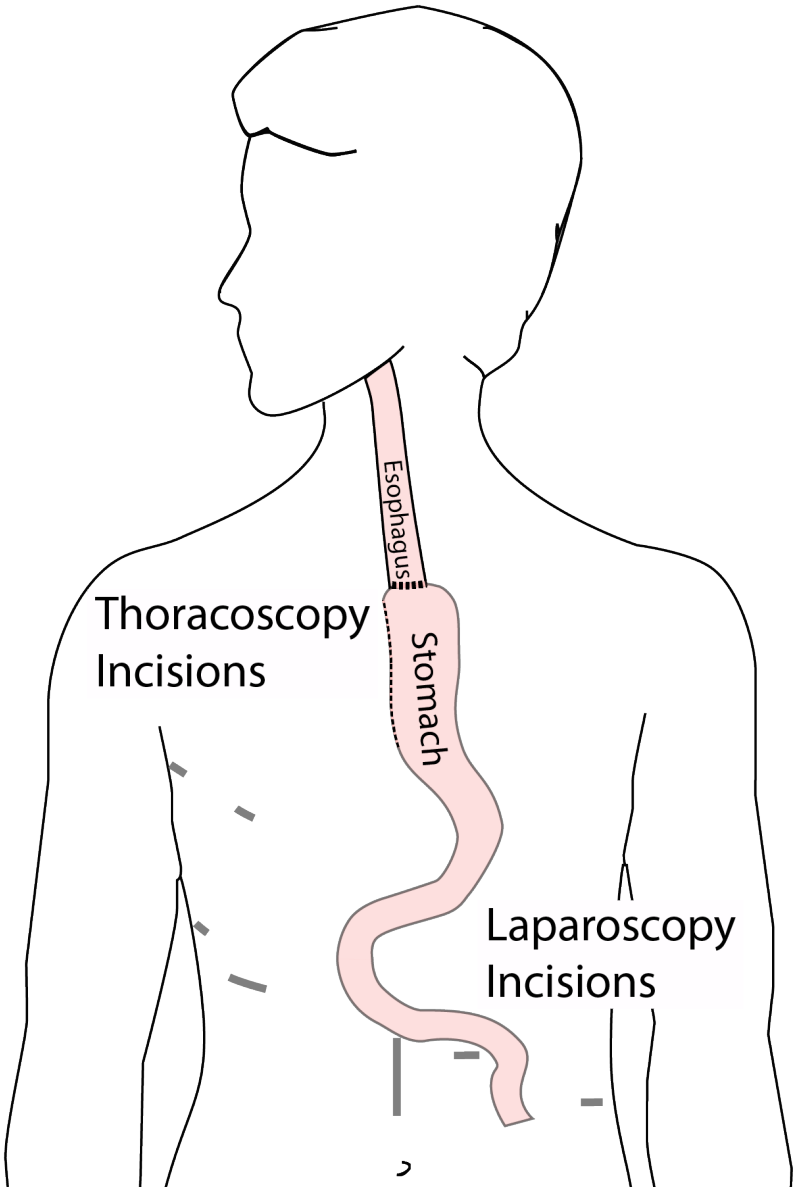
Minimally-invasive Ivor Lewis

- Small incisions abdomen and chest
- Surgical telescope and instruments
- Smaller incisions → faster recovery and less discomfort



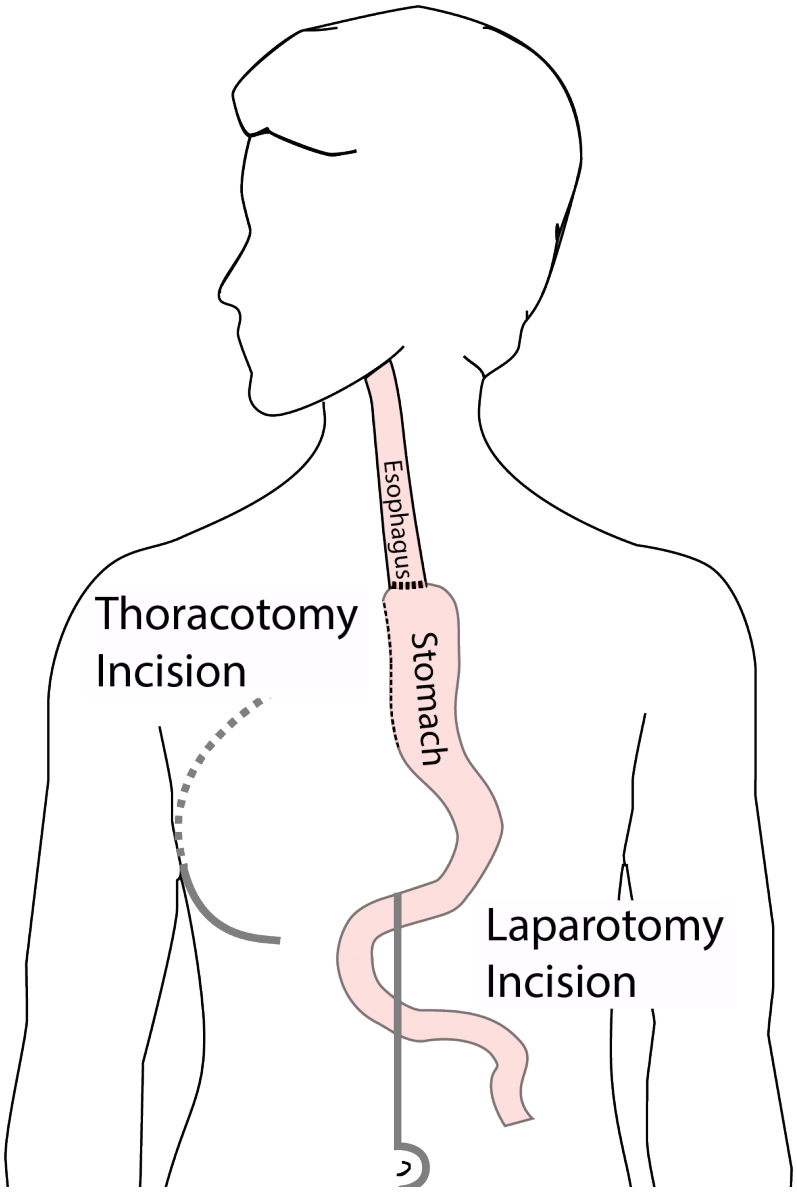
Minimally-invasive Ivor Lewis

We have found this is the best option for most of our patients. In some cases, an open approach is still necessary.



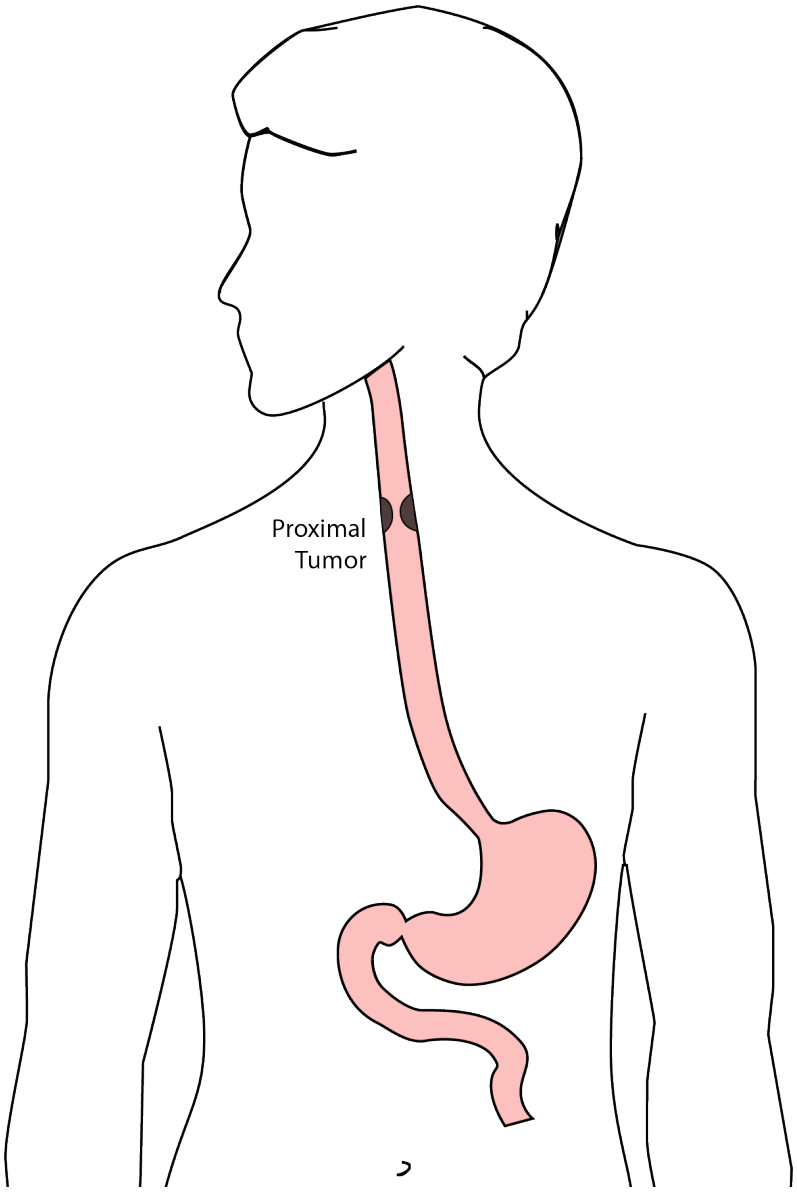
Open Ivor Lewis

In some cases, an open approach is still necessary.



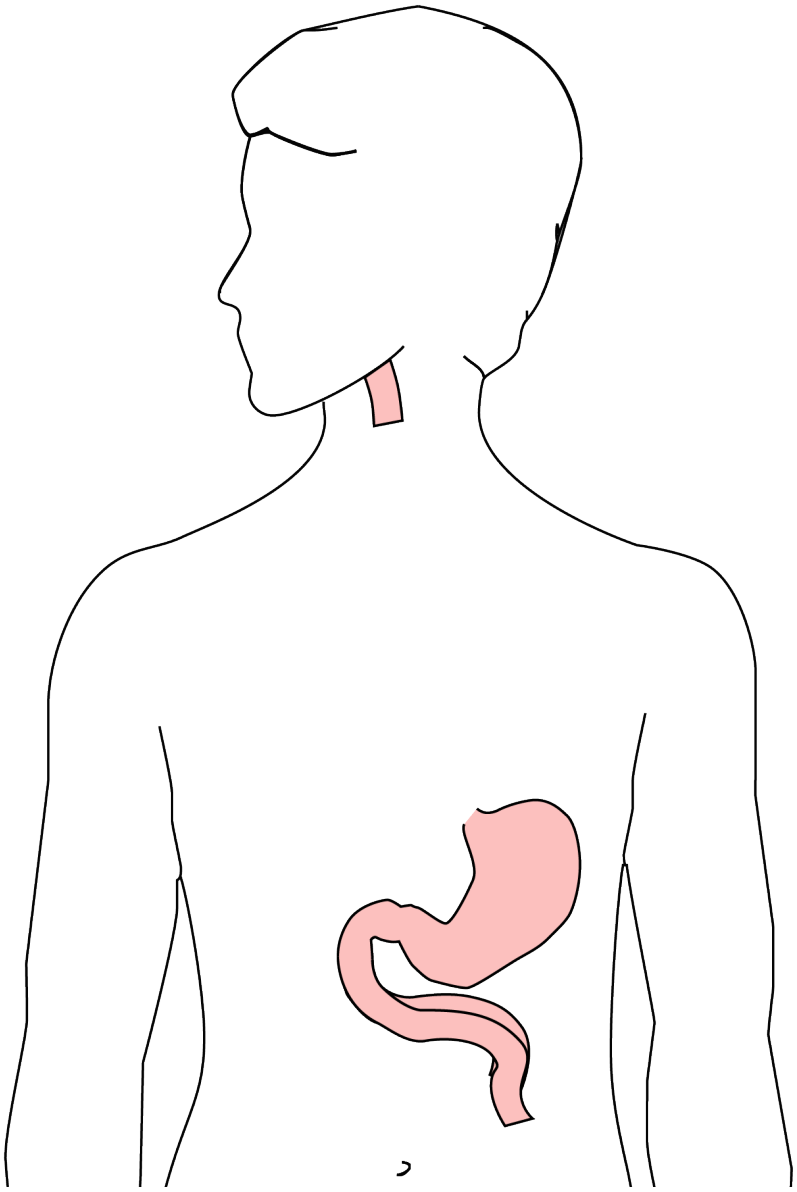
Total Esophagectomy

For patients with tumors in the upper esophagus, we need to remove more of the esophagus



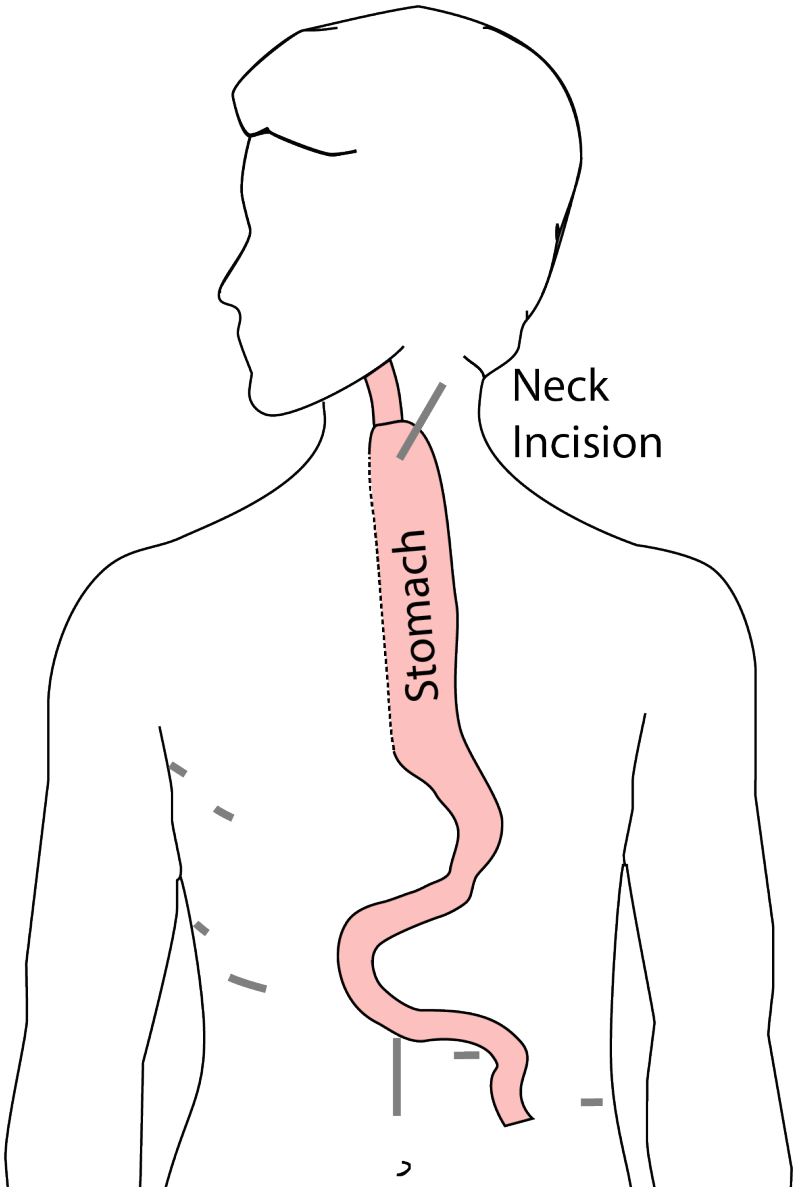
Total Esophagectomy

For those patients, we need to remove the whole esophagus



Minimally-invasive McKeown Esophagectomy

In this case, a connection between the esophagus and the stomach is made in the neck.



Risks of Surgery

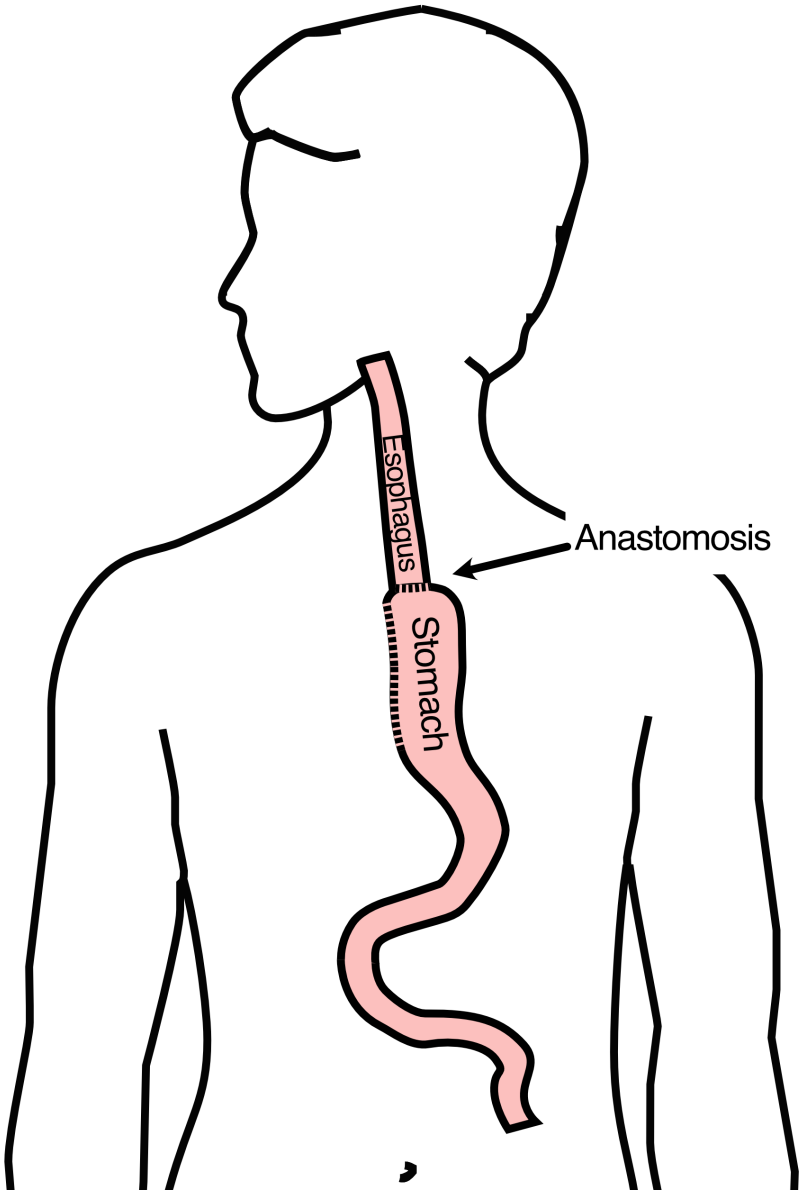
An esophagectomy is a substantial operation, and in some cases there can be postoperative complications. We're going to talk about two of these complications and what you can do to reduce your risk of complications:

- Anastomotic leak

- Pneumonia

Anastomotic Leak

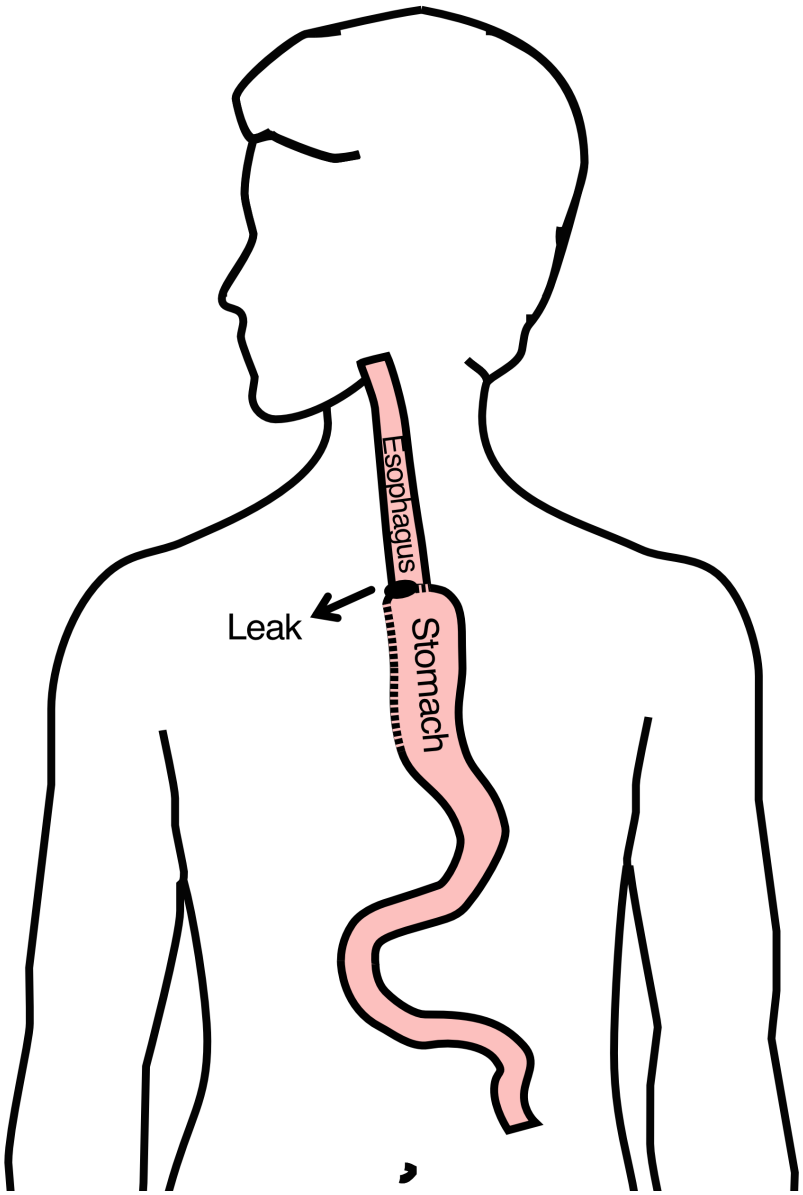
The anastomosis is surgical connection between the esophagus and the stomach.



Anastomotic Leak

If anastomosis does not heal properly:

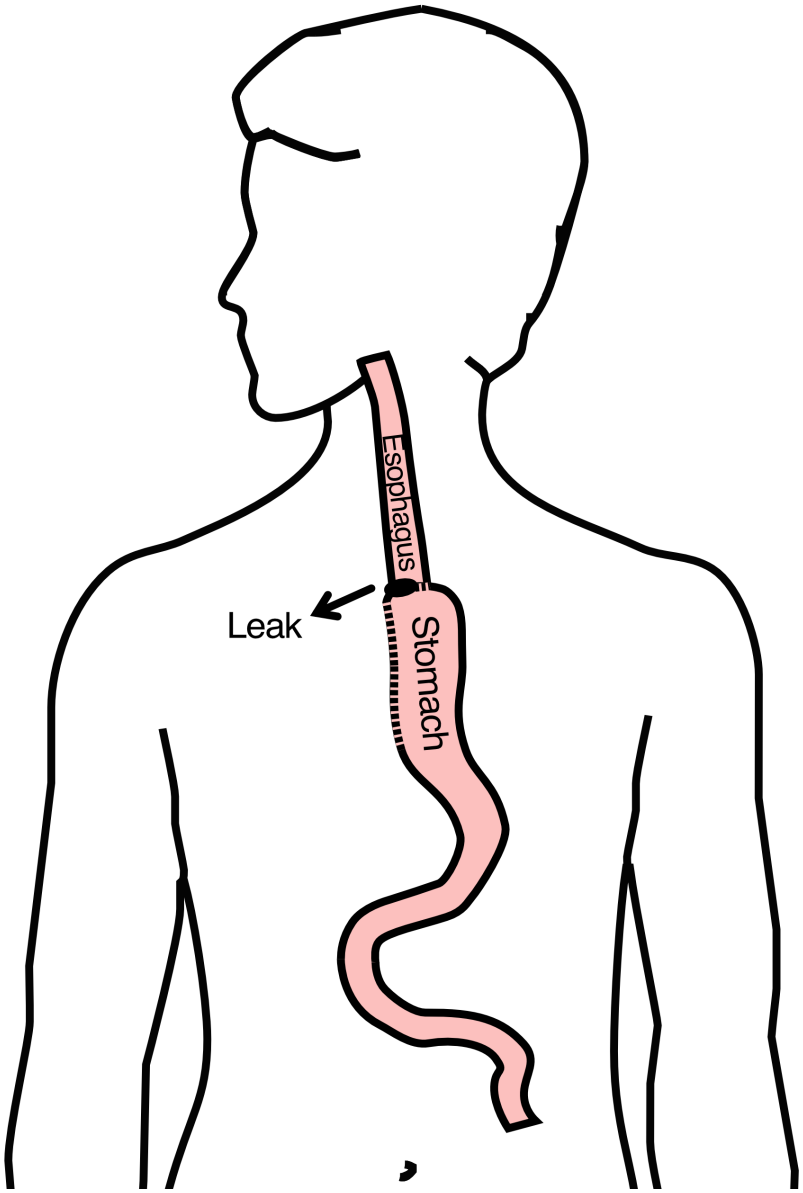
- Leakage of fluid from the esophagus
- Infection in the space between the lungs
- Requires additional time in the hospital



Anastomotic Leak

If an anastomotic leak does occur:

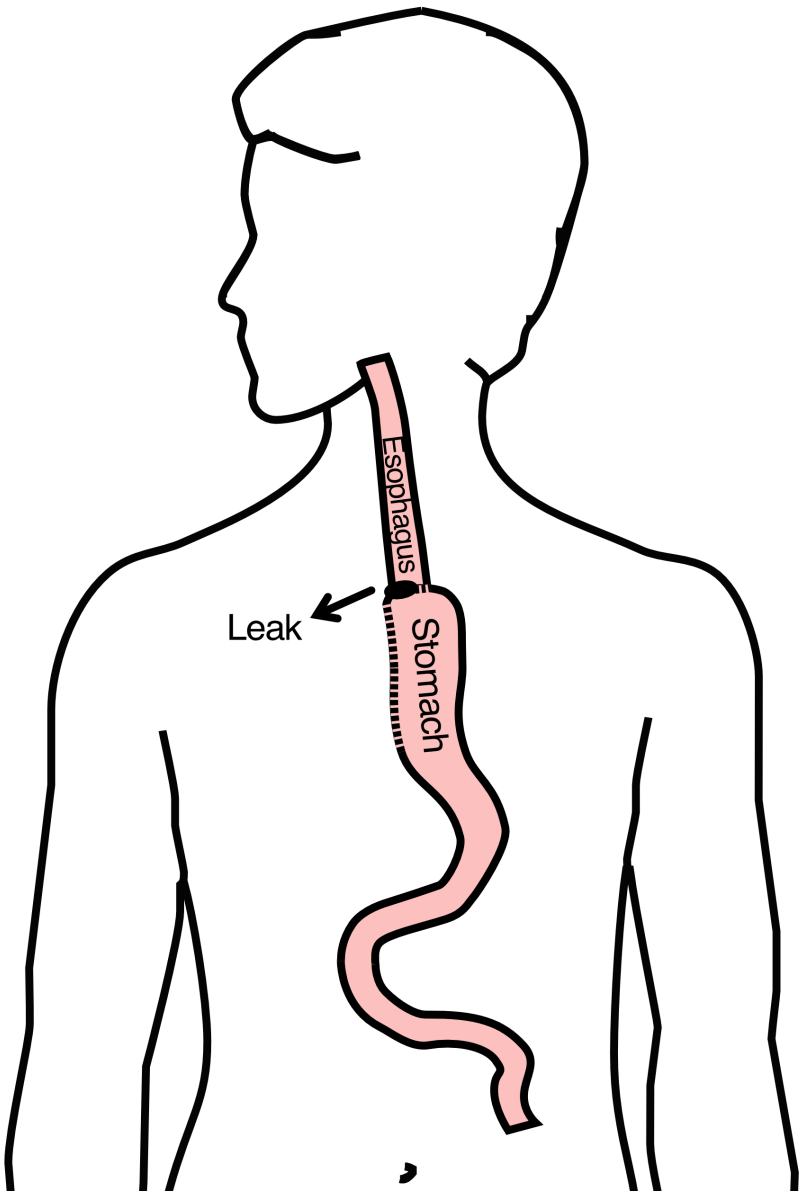
- Some leaks will seal on their own
- A stent may be required to help healing
- Occasionally additional surgey is required



Anastomotic Leak

Risk of a leak depends upon:

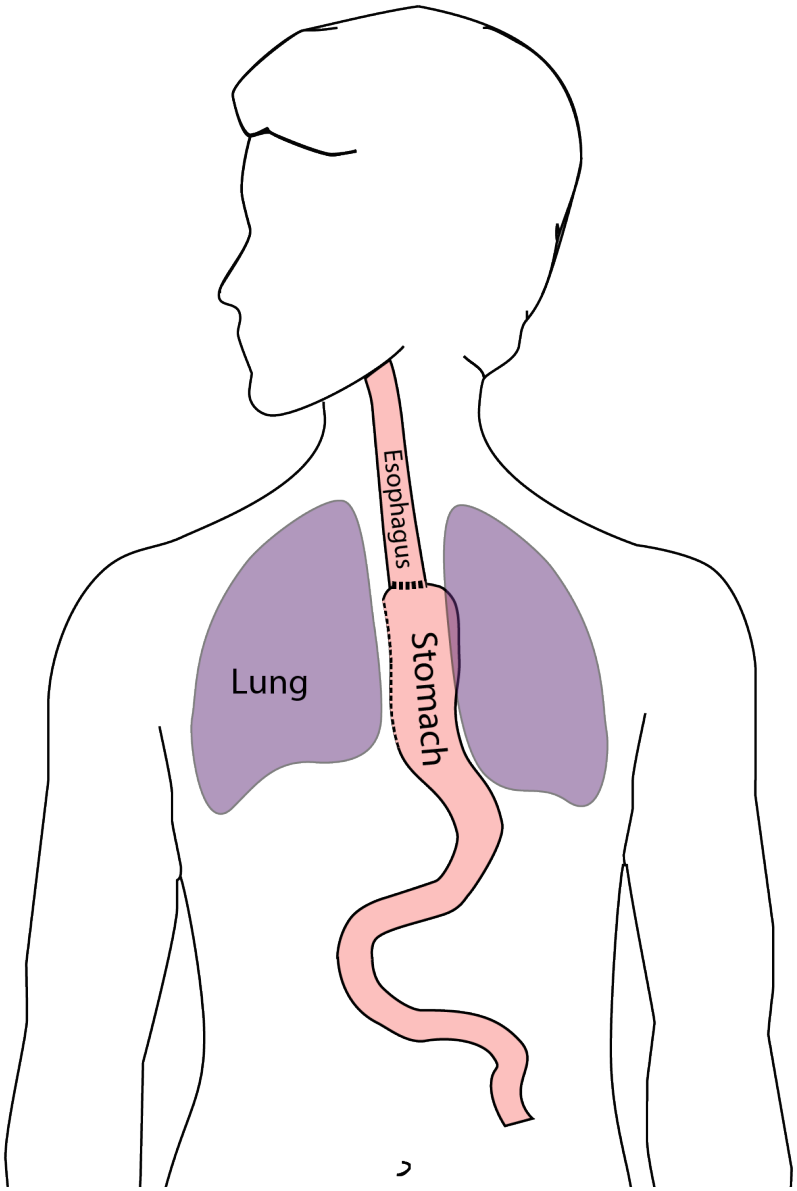
- Type of operation performed
- Overall nutritional status of patient
- Experience of the surgeon



Pneumonia

Pneumonia can occurs in about 10-15% of patients after esophagectomy.

Pneumonia requires treatment with antibiotics and frequently requires a longer hospitalization.



Preventing Pneumonia

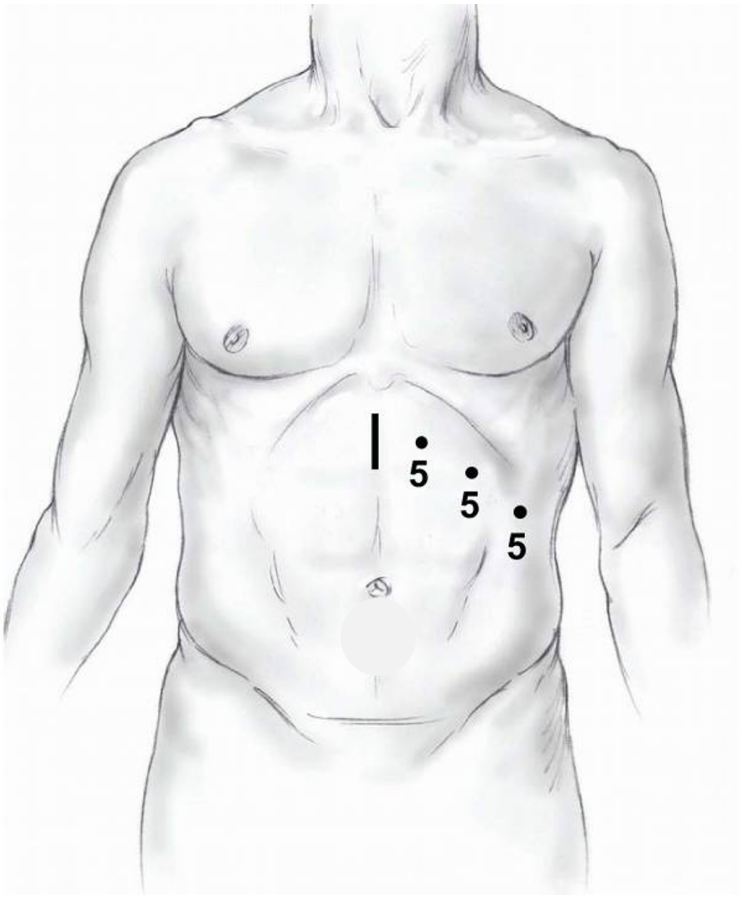
There are several ways to help prevent pneumonia after surgery:

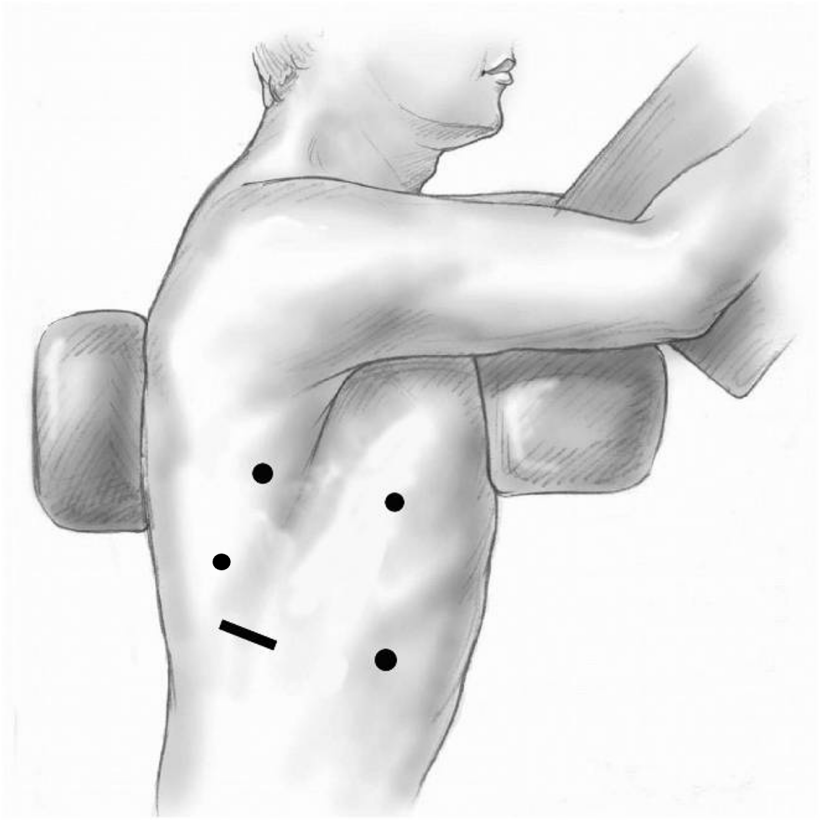
- Deep breathing
- Coughing
- Walking

After surgery, this means:

- Sitting in a chair most of the day
- Walking in the halls as soon as possible

Minimally-invasive Esophagectomy





Risks of Surgery

Risks related to anesthesia

- Heart attack (5%)
- Irregular heart rhythm (15%)
- Pneumonia (10%)
- Blood clots in legs (<5%)
- Pulmonary embolism (2%)

Risks of Surgery

Risks related to Surgery

- Anastomotic leak (5%)
- Stricture at anastomosis (15%)

- Death within 90 days of surgery
  - Low risk patients = 2%
  - Intermediate risk = 10%
  - High risk = 30%

Risks of Surgery

Table 1: Risks of Death within 90 Days of Surgery

	Age <75	Age >75
Normal Muscle (75%)	2%	10%
Low Muscle (25%)	10%	30%

Day Prior to Surgery

- Clear liquids for 24 hours prior to surgery
- Check with Pre-op nurse regarding medicines day prior to surgery
- No tube feedings the night before surgery

Day of Surgery

- Arrive at 5am – nothing to eat or drink after midnight.
- OK to take medicines with a sip of water (or coffee) but no cream.
- Surgery will be cancelled if you have cream or milk in the morning.
- Waiting room for family and friends on 5th floor
- Post-operative care in STICU (11th floor)

Anesthesia

Epidural catheter for pain control

- Remains in place for 2-5 days
- Dose can be adjusted as needed
- Can make it more difficult to empty the bladder
- May require foley (bladder) catheter to stay in place until epidural

Intensive Care Unit (1-2 days)

Multiple lines and tubes:

- NG tube in nose (stays in 2-7 days)
- Catheter in bladder (2-5 days)
- Chest tube right chest (2-4 days)
- Abdominal drains (2 or 3)

ICU

- Catheter in bladder removed → make certain the bladder empties properly
- Chest tube removed (day 2-4) → follow-up chest x-ray
- Fluid emptied from drains every few hours
- Start tube feedings by feeding
- Feeding jejunostomy (stays in 8 weeks)

Feeding Jejunostomy

- Feeding tube placed in small intestine
- Pump feedings require 16 hours (overnight)
- Run from 6pm to 10am

Feeding Jejunostomy - Typical Regimen

- Jejunostomy tube feeds for 16 hours (6pm to 10am)
  - Men: 75mL/hour x 16 hours = 5 cartons
  - Women: 60mL/hour x 16 hours = 4 cartons
- Water 240ml (8oz) via syringe 4x/day

Hospital nurses will teach you how to use the feeding tube pump

We want to make sure you can manage the pump before going home

Feeding Jejunostomy - Diabetes

Jejunostomy feeding tend to elevate blood sugars: Insulin may be required

Typical pattern:

- Jejunostomy feeds 6pm to 10am
- Insulin at 6pm (70/30)
- Insulin at MN (70/30)
- No insulin if feedings are not run

Activity

- Up in chair most of the day
- Walking in hallway with help from nurse/Physical Therapist
- Goals:
  - Improve lung function
  - Prevent muscle loss

Nasogastric Tube (NG)

NG is placed trough the nose into the stomach to remove fluid from the stomach and allow healing.

NG tube is removed after confirmation by x-ray that the stomach is starting to empty properly

Nasogastric Tube (NG)

X-ray on the 2nd to 4th day after surgery

- Will require standing up for 5-10 minutes
- Dye is injected into the NG tube
- If stomach empties, NG tube is removed

Modified Barium Swallow

Tests whether swallowing muscles are working properly

- Performed after nasogastric (NG) tube removed
- Drink a white chalky liquids in while x-rays are taken

70% have good swallowing function → 1oz of water every hour

Protein Shakes

Most are taking protein shakes when they go home

Protein shakes are started after tolerating water
- 2 oz per hour to start - 4 oz per hour if 2oz are tolerated well

Discharge

Goal: Ready to leave hospital day #6/7 after surgery

- Tube feeds at night (6pm to 10am)
- Protein shakes by mouth (70% of patients)
  - 4oz every 2 hours
  - Water by mouth 2 oz at a time Water through feeding tube (8oz 4x/day)

Nutrition at Home

Most patients go home with:

- Protein shakes by mouth 4oz at a time
- Tube feeds at night (4-5 cartons)
- Water through the feeding tube 8oz 4 times per day

Medicines at Home

- Proton pump inhibitor (acid blocker) for one year
- Reglan (metoclopramide) - stomach emptying: 6 weeks
- Lopressor (metoprolol) - prevent atrial fibrillation: 2 weeks

Pain Medicines at Home

- Acetaminophen 1000mg every 6 hours
- Gabapentin 300mg every 8 hours
- Oxycodone 5mg every 6 hours

In most cases, oxycodone is no longer needed by 6 weeks after surgery

Sleeping

Reflux can occur the first few weeks/months after surgery

This improves over the first few months

A wedge pillow can be helpful for sleep

Postoperative Visit

You will be seen in the office 7-10 days after discharge

- Adjust medicines
- Remove staples
- Remove drains (if needed)

Jejunostomy Removal (8 weeks after surgery)

Jejunostomy tube is removed in the office once you can take in enough nutrients by mouth

May take 30 minutes and some local anesthetic to loosen up the tube for removal.

Nutritional Monitoring after Surgery

You may have some difficulty absorbing some nutrients:

- Iron
- Vitamin B12
- Vitamin D

Nutritional Monitoring after Surgery

About 3 months after the jejunostomy tube is removed, we will check blood levels:

- Iron (ferritin)
- Vitamin B12
- Vitamin D.

Nutritional Replacements after Surgery

Vitamin or iron replacements can be ordered by your primary care physician, medical oncologist, or surgeon

If levels are low, repeat testing in several months may be needed.

Nutrition

Nutrition Slideshow