Esophagectomy

1 Introduction. L 1

I'm Dr Jonathan Salo, a GI Cancer Surgeon in Charlotte, North Carolina. These videos are designed to educate you about cancer and its treatment and help you and you cancer care team make the right decisions for you.

Of course, there is no substitute for the expert opinions of your cancer care team.

2 Surgery of the Esophagus

In this viedo we'll discuss *surgery of the esophagus*

In this video, you will learn about (2)

- Different Type of esophagectomy
- Complications

At the end we will discuss ways that your surgical team can reduce the risk of complications

3 Esophagectomy

Esophagectomy is the surgical removal of the esophagus

4 Esophagectomy -

Another terms is esophagogastrectomy (4)

5 Esophagectomy

Esophagectomy is generally performed for three different situations:

- Superficial Tumors (T1) that can't be completely removed by endoscopy (5)

Superficial tumors are T1. If this terminology is not familiar to you, this may be a good time to view our video about Esophageal Cancer Staging and Treatment

We also have a separate video about superficial or "early stage" tumors and how they can sometimes be removed through endoscopic therapy without the need for surgery.

6 Esophagectomy.

Esophagectomy is also performed for

- Localized Tumors that are T1b or T2 (6)

7 Esophagectomy

- Locally Advanced Tumors, which are T3 or Node-positive (6)

8 Esophagectomy

Locally-advanced tumors usually treated with some sort of preoperative therapy prior to surgery.

Preoperative therapy is usually some combination of chemotherapy, immunotherapy or radiation therapy

We have videos which discuss locally-advanced esophageal cancer, which you may find helpful.

9 Goals of Esophagectomy

The goals of esophagectomy are to remove the tumor (9)

10 Goals of Esophagectomy

And nearby lymph nodes (10)

11 Goals of Esophagectomy

An *additional* portion of the esophagus and stomach is also removed with the tumor to reduce the risk of recurrence (12)

12 Reconstruction

In most cases, the lower part of the stomach is fashioned into a tube, to create a new esophagus. ## Reconstruction

The esophagus and stomach tube are now joined together

The new connection between esophagus and stomach is called the anastomosis (14)

13 Types of Esophagectomy. 4

There are two major types of esophagectomy:

Partial esophagectomy removes the lower 2/3 of the esophagus

Total esophagectomy removes all of the esophagus (15)

14 Partial Esophagectomy 2

During a partial esophectomy, the new connection between esophagus and stomach (or anastomosis) made in the chest (16)

15 Ivor Lewis Esophagectomy

A partial esophagectomy is also referred to as an Ivor Lewis esophagectomy

16 Total Esophagectomy

A total esophagectomy removes all of esophagus, and a new connection (or anastomosis) made in the neck (18)

17 Total Esophagectomy

Two different approaches to total esophagectomy

Transhiatal approach or

McKeown which is also known as the three-incision esophagectomy (19)

18 Which Esophagectomy? 4

Your surgeon will recommend a surgical approach based upon a number of factors.

One factor is the location of the tumor (20)

19 Distal - Partial 2

For tumors located in the lower, or distal part of the esophagus, a Partial esophagectomy will remove the cancer and enough additional esophagus to ensure that the cancer is completely removed (21)

20 Distal - Partial

So for distal cancers, an Ivor Lewis Approach is a common operation (22)

21 Upper = Proximal

For tumors located in the upper or proximal part of the esophagus, a total esophagectomy is required to remove all of the cancer.

22 Which Esophagectomy - Suirgeon 4

Another important factor is surgeon preference and experience.

You will have an opportunity to discuss the operation when you meet with your surgeon

23 Why Remove so much Esophagus?

A question I am commonly asked is “why do you need to remove so much esophagus?=”

24 Surgical Techniques 2

Another aspect of surgery are the techniques used.

An esophagectomy can be performed with open techniques

or minimally-invasive techniques (25)

25 Open Surgery

An open esophagectomy uses a laparotomy incision to access the abdomen, and a thoracotomy to access the chest (26)

26 Minimally InVasive

Minimally-invasive techniques uses small incisions and specialized instruments.(27)

27 Minimally InVasive

These techniques can reduce discomfor and length of hospital stay. (28)

28 Laparoscoic techniques

Laparoscopic techniques use special instruments to work through small incisions. These are directly controlled by the surgeon. (28)

29 Robotic techniques

In some cases, robotic techniques can be used. The surgeon controls the robotic instruments from a console (29) which allows 3-D view inside the abdominal cavity

30 Robotic techniques

The surgeon operates the hand controls (30)

31 Robotic techniques

…and is able to direct the movements of the robotic arms (31)

32 Robotic techniques

The robot has laparoscopic arms which enter the abdomen through small incisions (32)

33 Robotic techniques

The robot precisely mimics the actions of the surgeon (33)

34 Risks of Surgery 4

There are three major risks of surgery you will want to discuss with your surgeon

- Leakage from the anastomosis
- Pneumonia
- Injury to nerve to the larynx (34)

35 Leak from Anastomosis 2

The anastomosis is the new connection made between the esophagus and the stomach.

If the anastomosis does not heal properly. (34)

36 Leak from Anastomosis

Fluid from inside the esophagus leaks into the chest cavity. (3=5)

37 Leak from Anastomosis

This can lead to infection (36)

38 Leak from Anastomosis

and a prolonged hospital stay (37)

39 Treatment of Leak

In some cases, small leaks will heal as long as there is adequate nutrition (38)

40 Stent

IN some cases a stent is placed inside the esophagus to patch the leak from the insisde (40)

41 Esophageal Stent

The stent is a wire mesh tube covered in plastic, which is placed inside the esophagus by endoscopy. (41)

42 Esophageal Stent

Once healing has occured, the stent is removed, typically about 6 weeks later (42)

43 Leak -> Surgery

Less commonly, a leak may require reoperation (43)

44 Risk factors for leak. 4

The location of the anastomosis affects the risk of anastomotic leak (44)

45 Total higher risk 2

In cases of a total esophagetomy, the risk of leak is higher, because the stomach needs to reach higher to make a connection in the neck.

In cases of a parital esophagectomy, the risk of leak is lower. (45)

46 Risk factors for leak 4

Once the connection is made between the esophagus and the stomach, we depend upon the body's ability to heal and strengthen the connection. So the overall health of the patient is important.

Patients who have had poor nutrition are at higher risk of anastomotic leak. (46)

47 Risk factors for leak

And finally, the experience of the surgical team affects the risk of leak. Hospitals and surgeons who have more experience with esophageal surgery tend to have lower risk of anastomotic leak. (47)

48 Pneumonia 2

Pneumonia is an infection in the lungs(48)

49 Pneumonia

We think these infections come from bacteria in the mouth (49)

50 Secretions from the Mouth

The secretions in the mouth contain bacteria (50)

51 Secretions from the Mouth

Ordinarily these secretions pass into the esopahogus (51)

52 Secretions from the Mouth

Ordinarily these secretions pass into the esopahogus (51)

53 Secretions from the Mouth

And are swallowed (52)

54 Secretions from the Mouth

Those secretions can occasionally enter the windpipe (53)

55 Secretions from the Mouth

But are ordinarily quickly cleared by a cough (54)

56 Secretions in the Airway

After surgery, however, it is possible for secretions to enter the airway and pass into the lungs (55)

57 Pneumonia Prevention 2

There are a couple of strategies we can uses to prevent pneumonia after surgery (56)

The first is to reduce the amount of bacteria in the mouth.

58 Pneumonia Prevention

Research has shown that brushing the teeth five times per day for the week before surgery reduces the risk of pneumonia (57)

59 Pneumonia Prevention

It may also be helpful to see your dentist for a checkup to make eliminate any possible sources of infection in the mouth (58)

60 Pneumonia Prevention

You can also help your lungs fight infection (59)

61 Pneumonia Prevention

By stopping smoking (60)

62 Pneumonia Prevention after Surgery

After Surgery, it is important to clear secretions from the lungs by Coughing (61)

63 Pneumonia Prevention after Surgery

Deep breating (62)

64 Pneumonia Prevention after Surgery

Walking (63)

65 INcentive spirometer

An incentive spirometer is a device which can help coach you to take deep breaths after surgery (64)

66 Pain control

Coughing, deep breating, and walking after surgery can be unconfortable, so another important strategy to prevent pneumonia is to work to minimize discomfort. (67)

67 Pain control

Minimally-ilnvasive techniques, either laparoscopic or robotic, can help reduce discomfort by the use of small incisions (66)

68 Pain control

The other strategy is pain control

69 Epidural Catheter

An epidural catheter can help with postoperative discomfort. This is similar to the epidural used for childbirth. A small tube is placed near the spine (68)

70 Epidural Catheter

This allows the administration of pain medicines whcih can provide pain relief without sedation 69)

71 Epidural Catheter

The goal, of course is to minimize pain (70)

72 Epidural Catheter

And make it easier to cough, deep breathe, and walk after surgery

73 1

We hope you have found this video helpful. Here are links to some other videos.

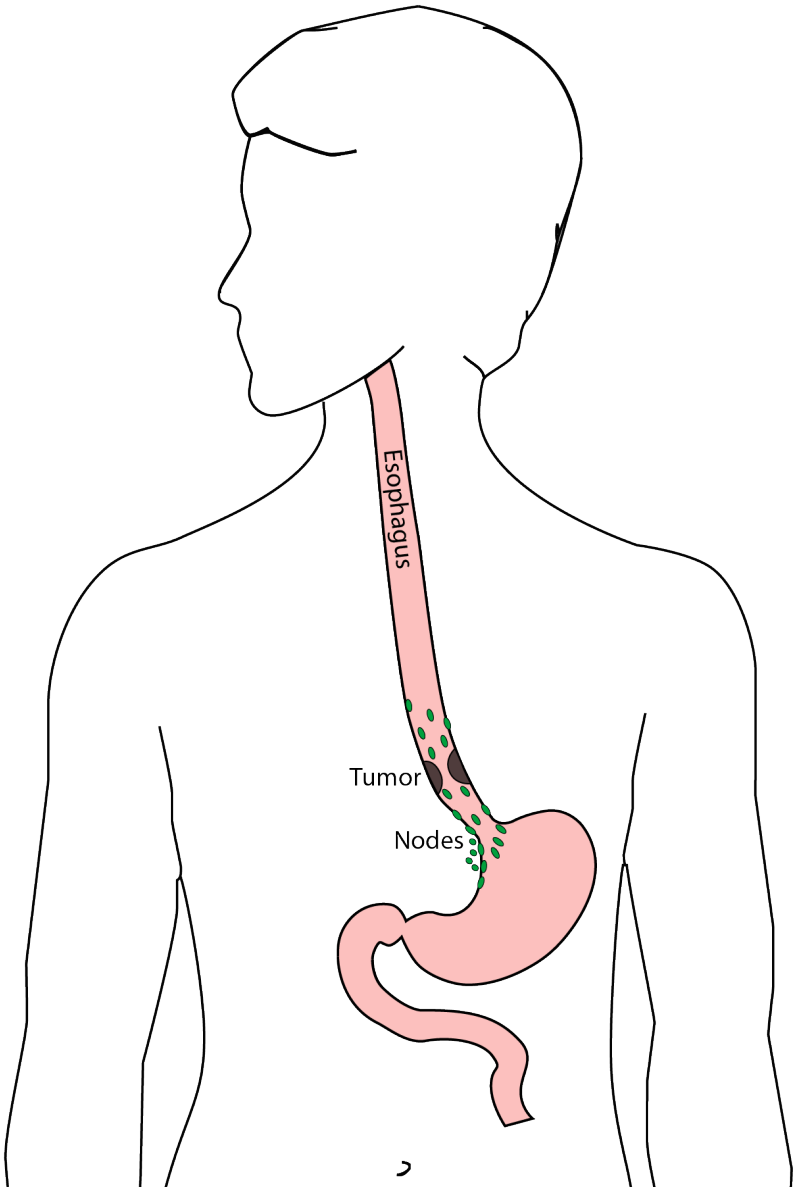
Feel free to leave a comment or a question, or if you have suggestions for future videos.

If you or a family member have had an encounter with esophagectomy surgery, I would love to hear about your experience, so please take a minute to leave a comment below.

We're constantly creating new videos, so please subscribe to be notified of new videos when we post them. (29)

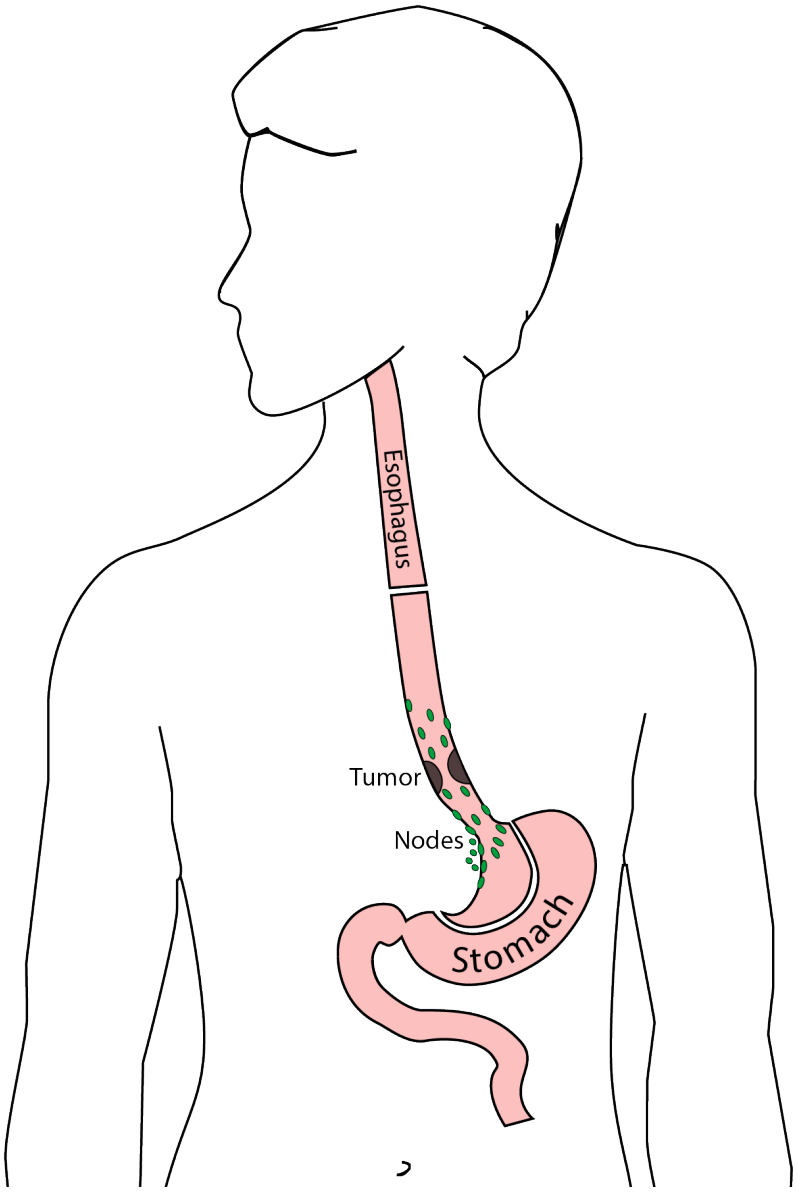
74 Nutritional consequences of surgery

- Remove tumor from esophagus
- Remove surrounding lymph nodes
- Create a new esophagus, usually from the stomach



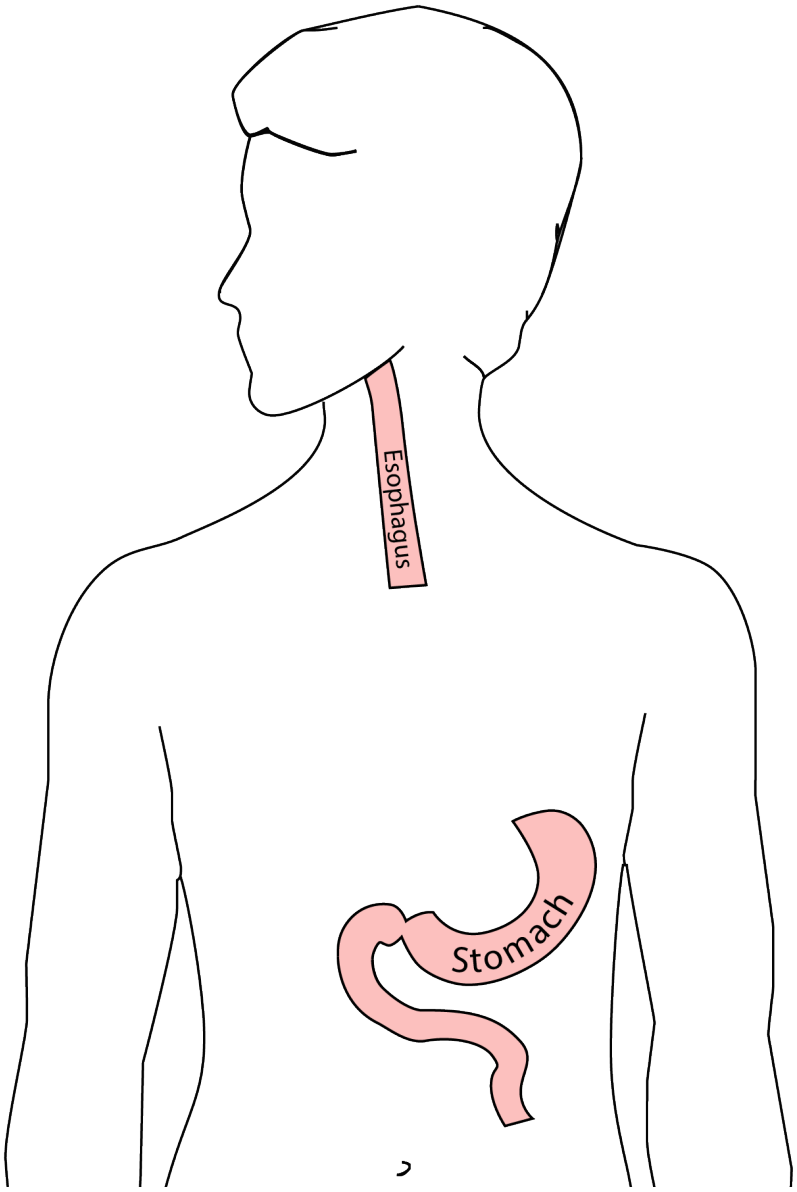
75 Ivor Lewis

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



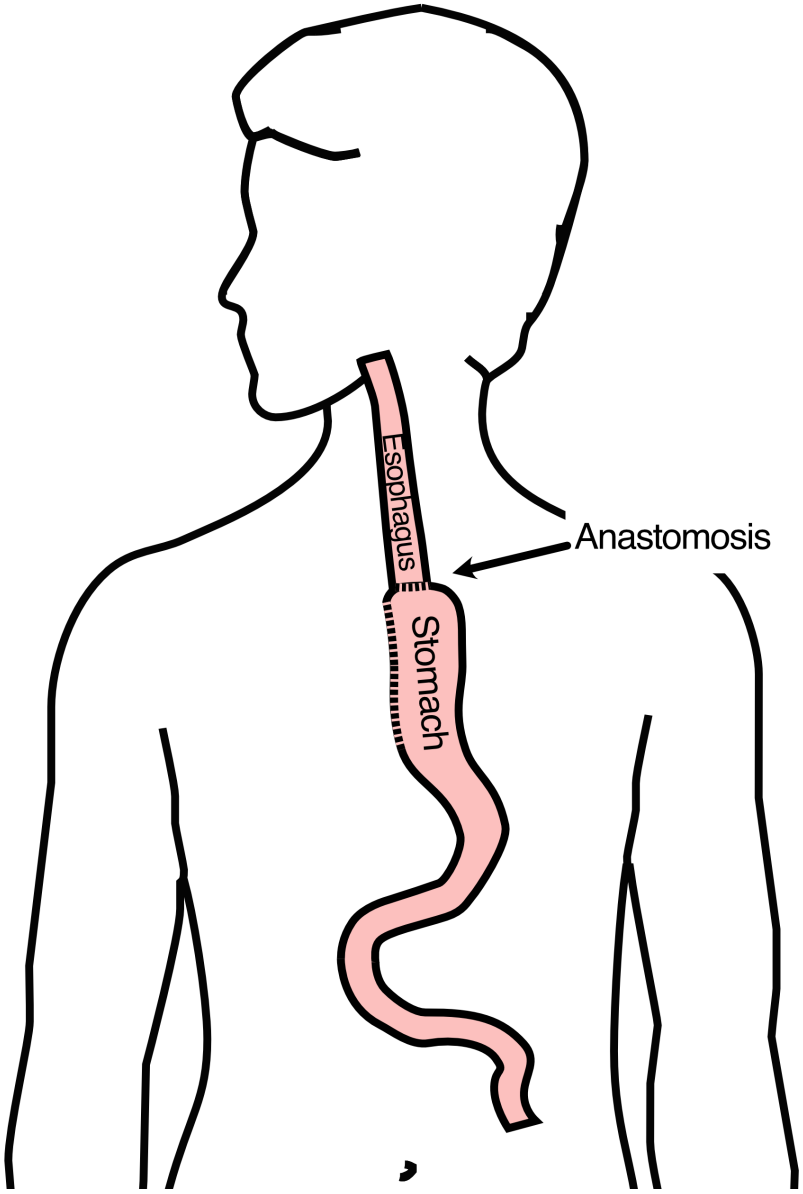
76 Reconstruction

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



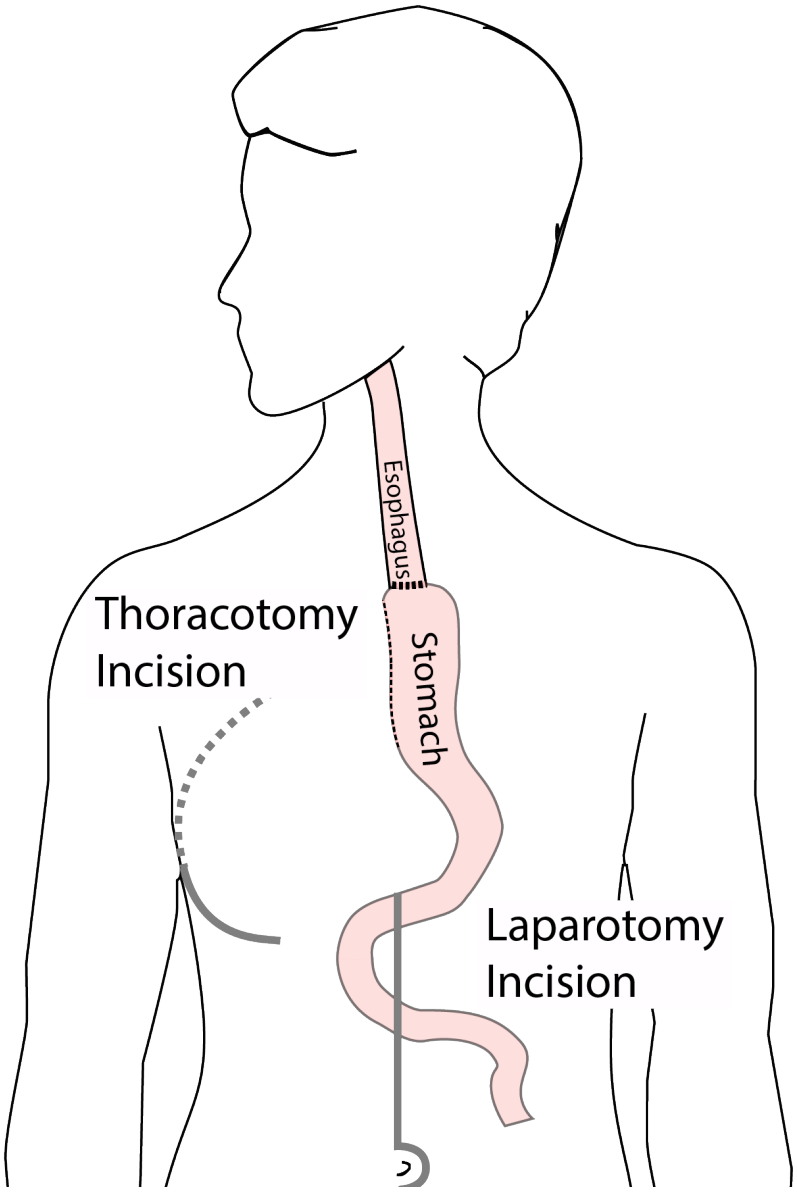
77 Ivor Lewis esophagectomy

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



78 Open Esophagectomy

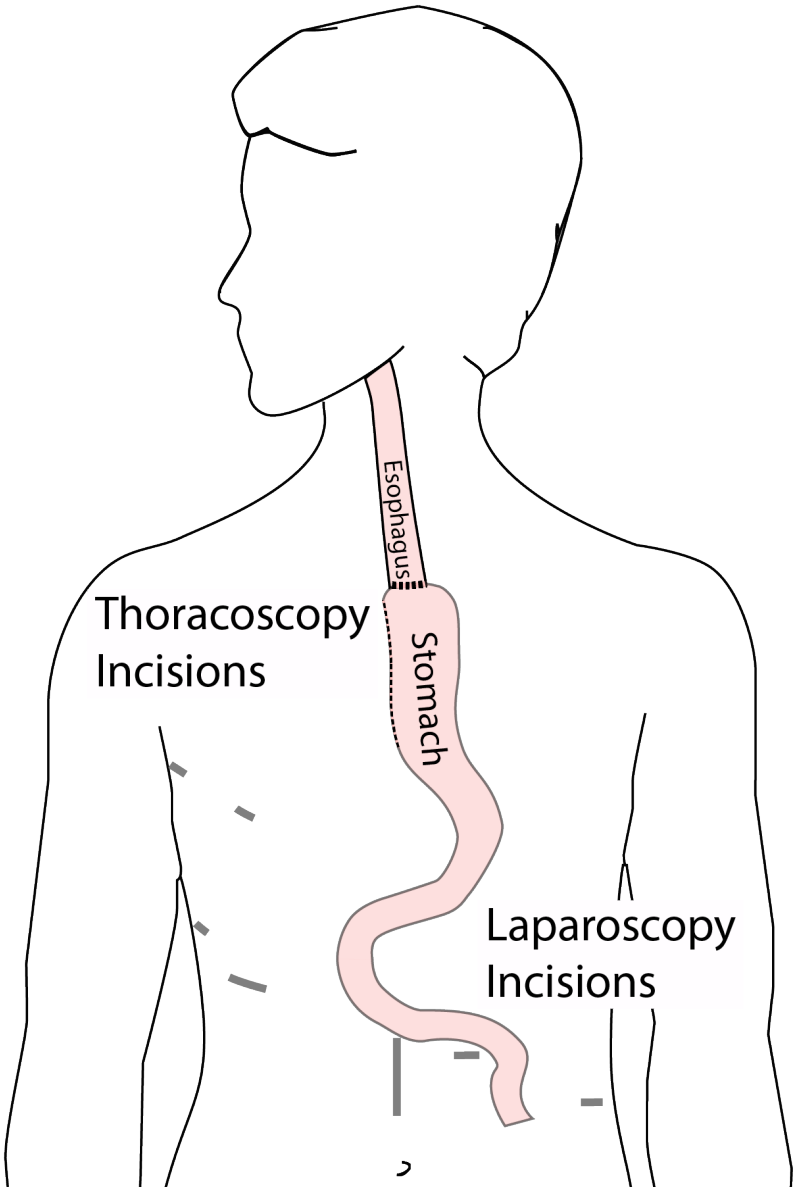
Open esophagectomy uses conventional incisions in the abdomen and the right chest. An incision is made between the ribs on the right side, and an abdominal incision made from the breast bone to below the belly button. This is a well-established surgical approach which has been used for the past 75 years.



79 Minimally-invasive Ivor Lewis

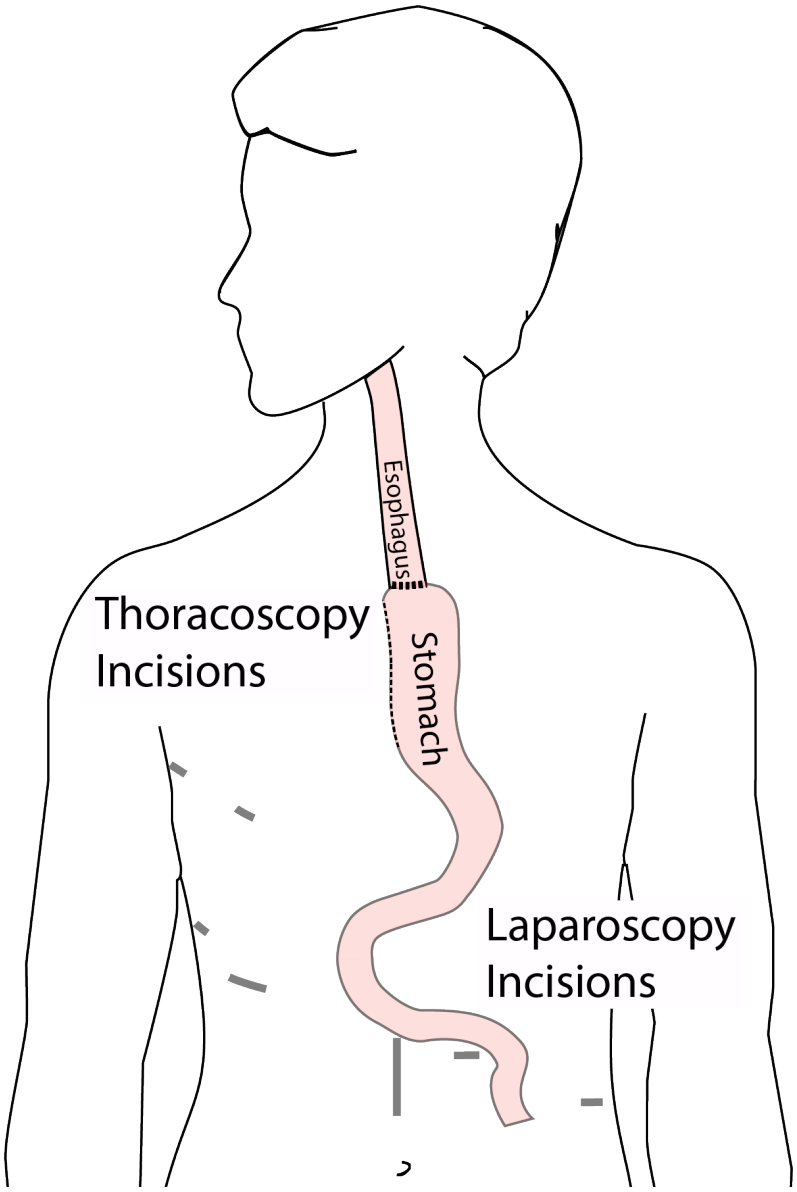
Mininally-invasive esophagectomy uses small incisions in the abdomen and chest. A surgical telescope and special instruments are used to perform the operations. This operation is a more recent innovation and can be used in many cases instead of an open approach.

The smaller incisions mean faster recovery and less discomfort



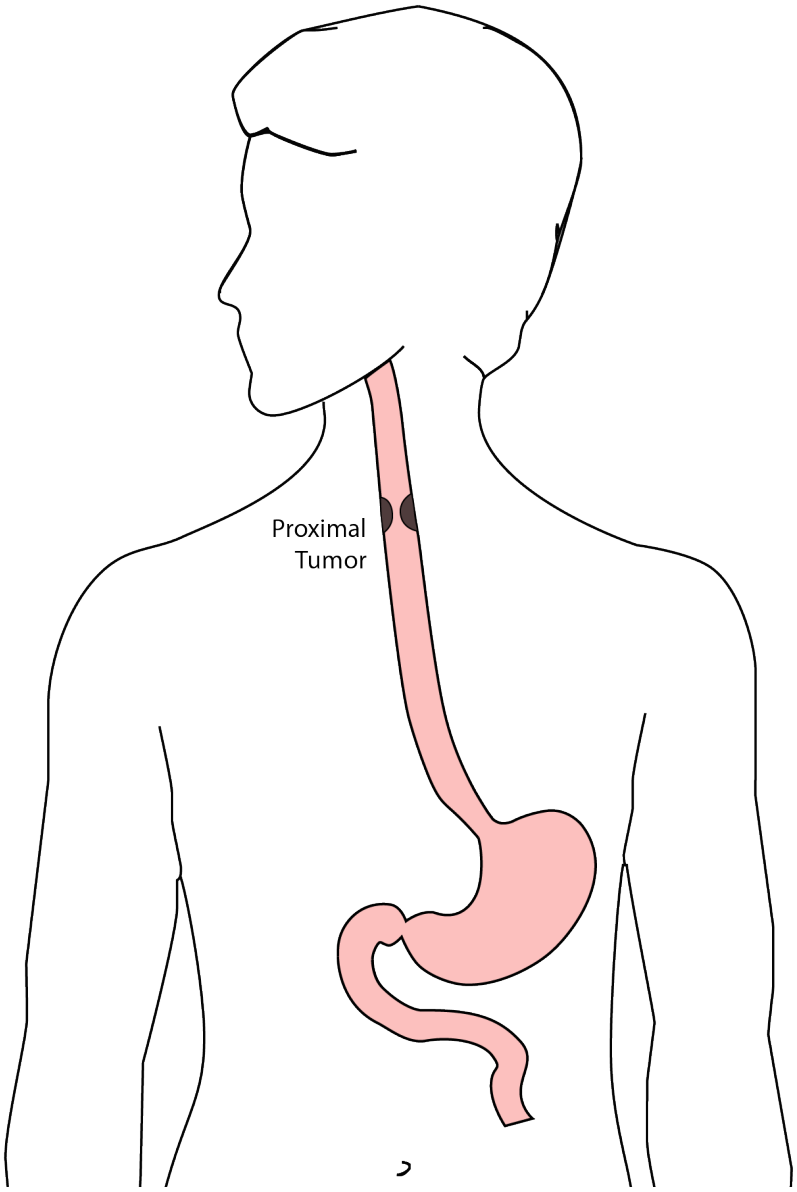
80 Minimally-invasive Ivor Lewis

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



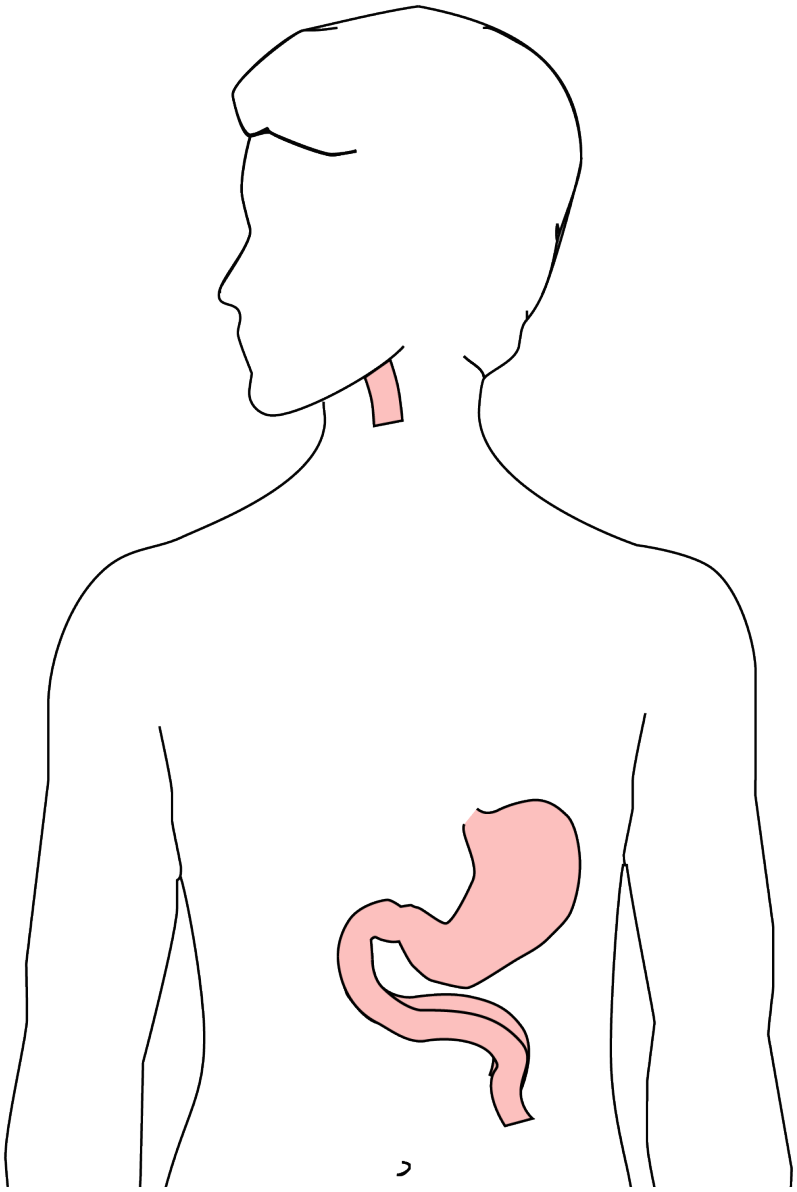
81 Total Esophagectomy

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



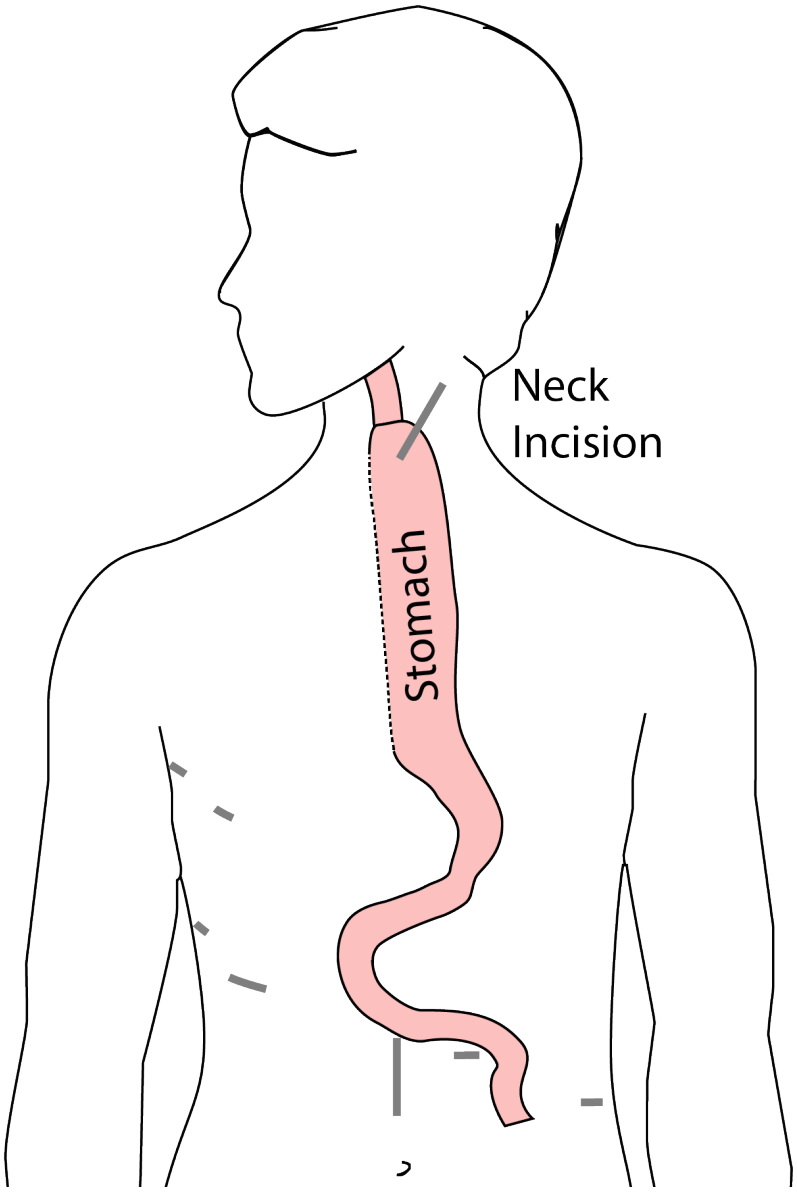
82 Total Esophagectomy

For those patients, we need to remove the whole esophagus



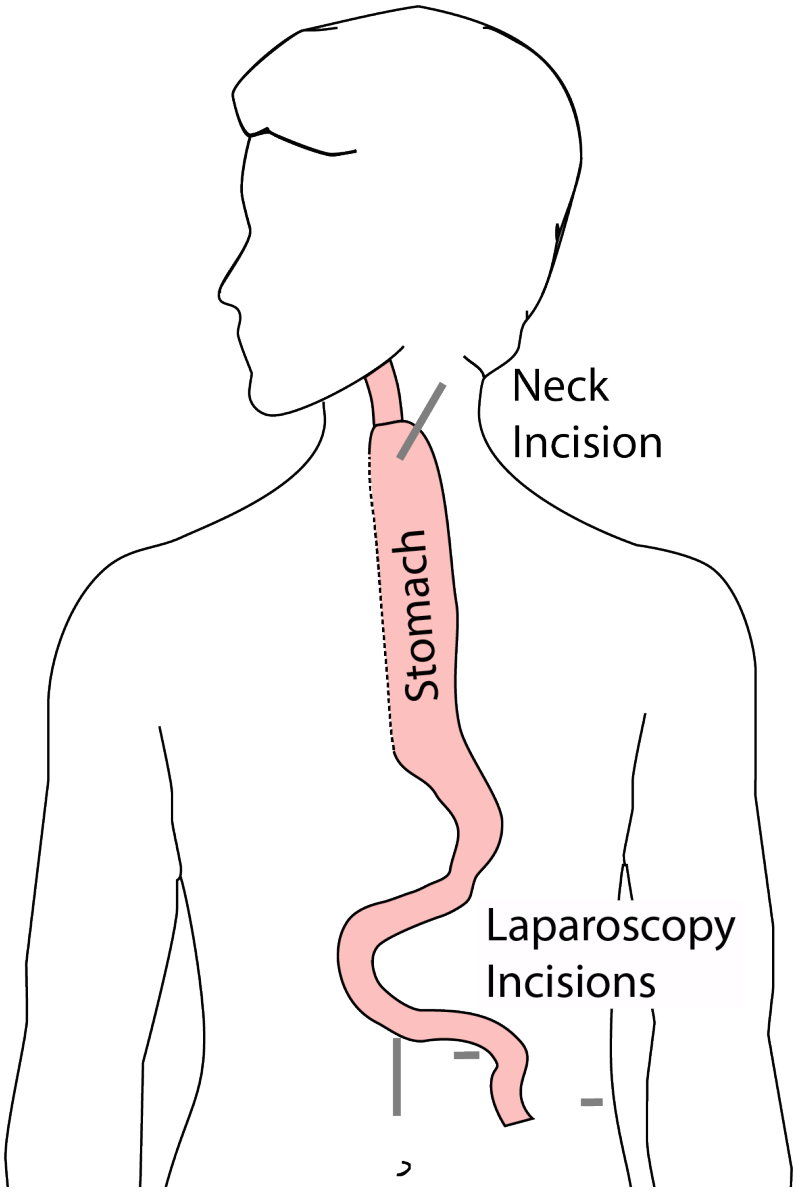
83 Minimally-invasive McKeown Esophagectomy

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



84 Transhiatal Esophagectomy

Another option is a transhiatal esophagectomy, which avoids the need to make incisions in the right chest. The operation is performed from the abdomen and the right neck.



When you meet with your surgeon, you will have an opportunity to discuss your particular situation and their recommendation for surgery. Your surgeon will recommend a surgical approach based upon you and your tumor and their personal experience.

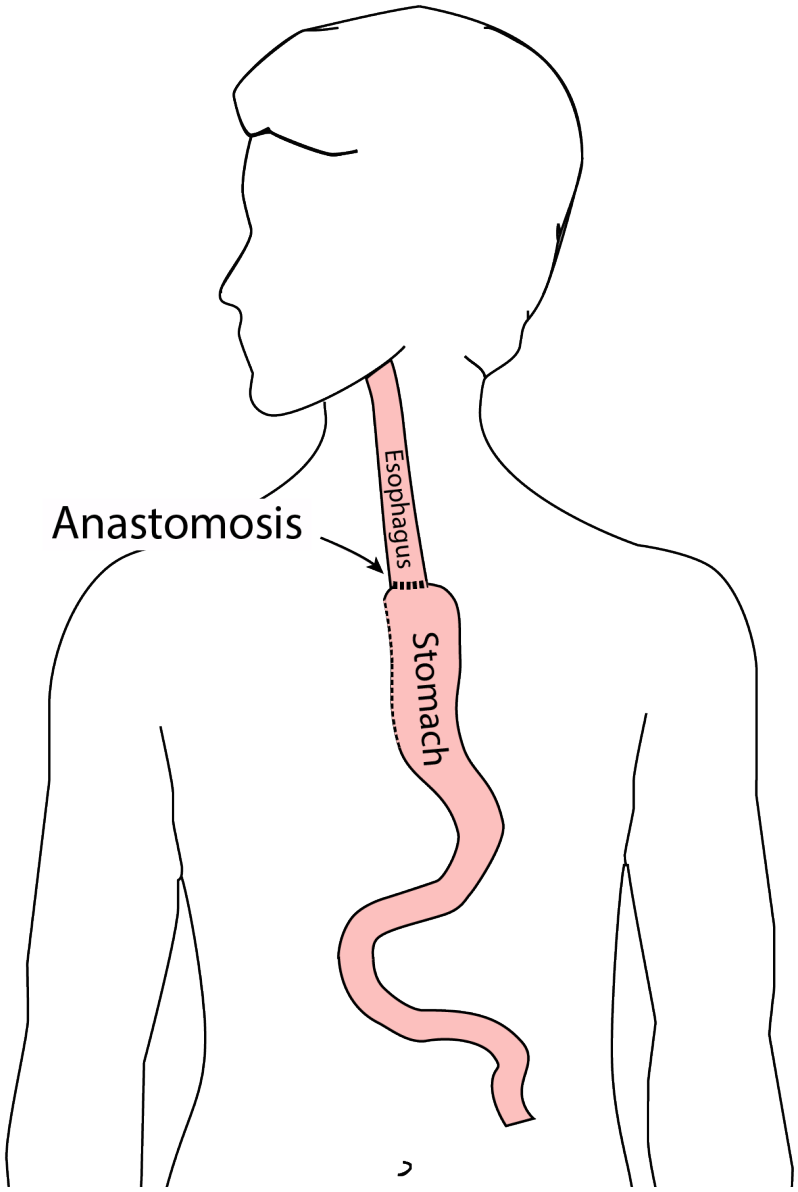
85 Risks of Surgery

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

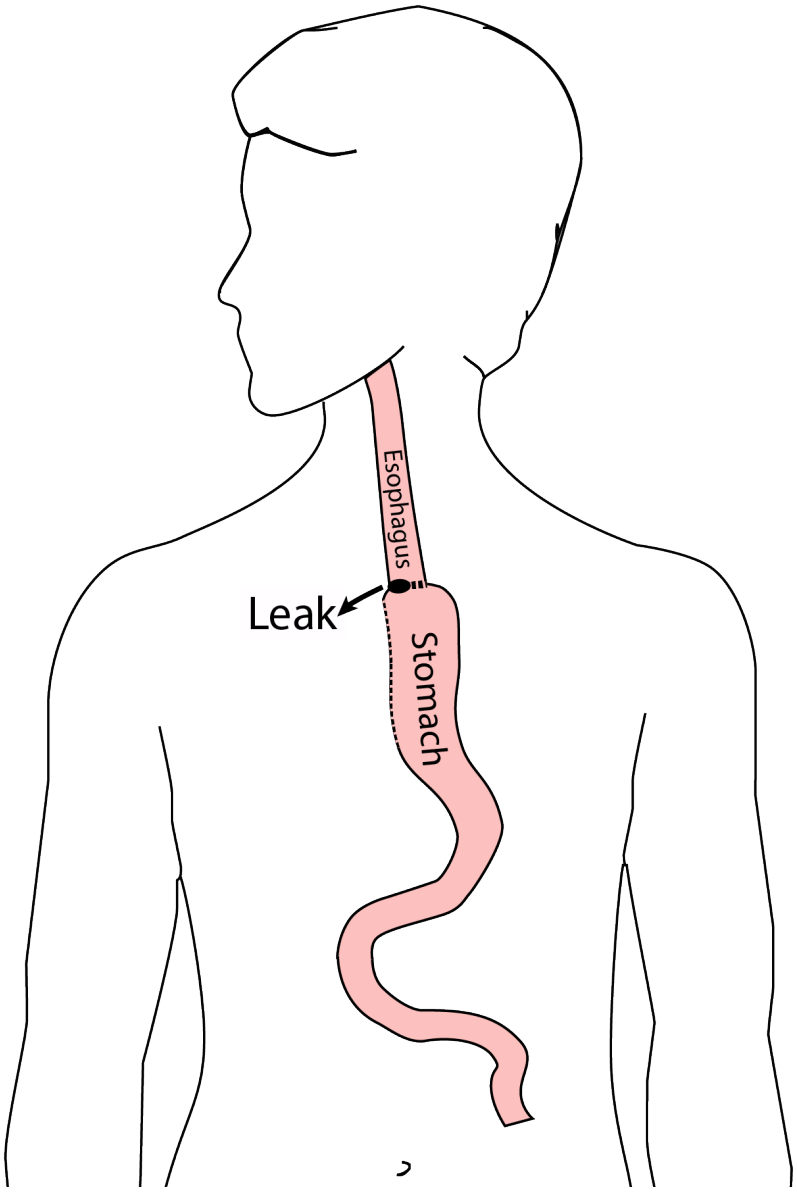
86 Anastomotic Leak

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



87 Anastomotic Leak

If anastomosis does not heal properly, this can cause a leakage of fluid from the esophagus, called an anastomotic leak. If this happens, an infection can occur in the mediastinum, which is the space near the heart between the lungs.

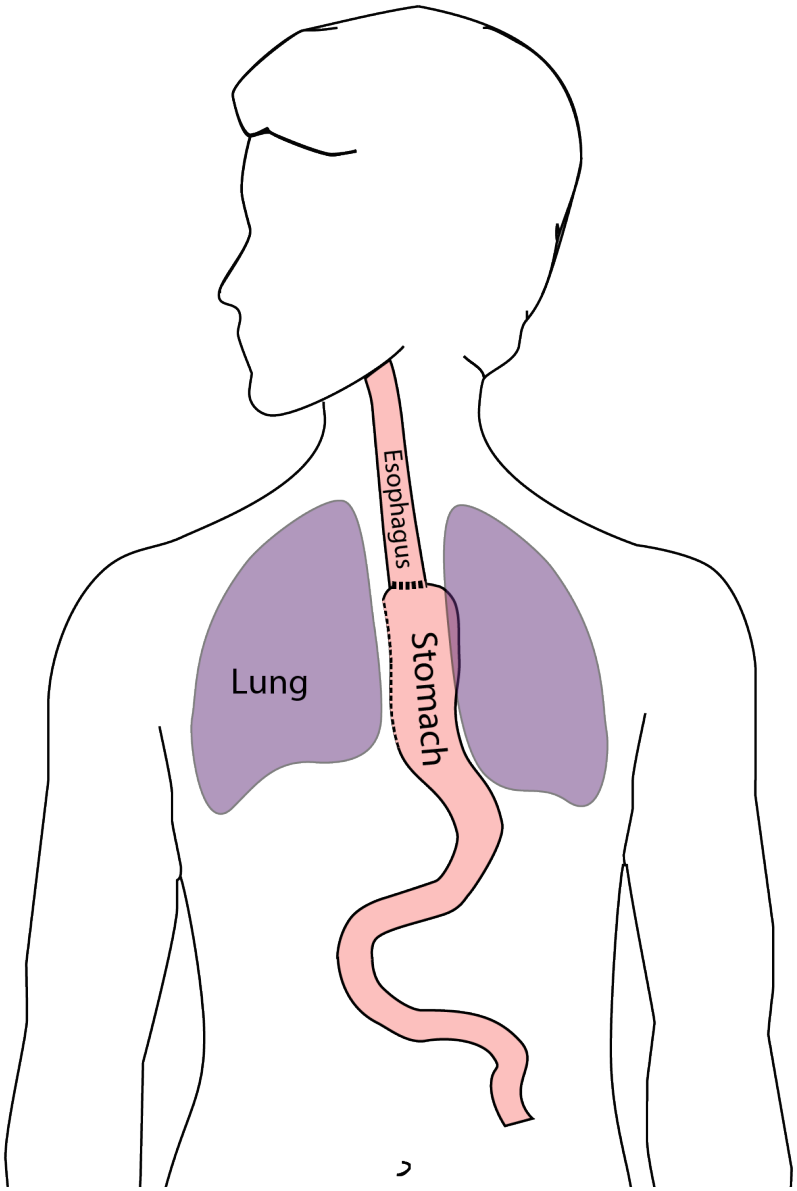


88 Anastomotic Leak

In some cases, the leak will heal on its own, but other cases may require additional procedures or even surgery. The risk of leak depends upon the operation performed but also depends upon the experience of the surgeon. At the end of this video we have a link to a video about how to choose a hospital and a surgeon, which talks further about the risks of a leak.

89 Pneumonia

Pneumonia is another complication which can occurs in about 10-15% of patients after esophagectomy. Pneumonia requires treatment with antibiotics and frequently requires a longer hospitalization.



90 Preventing Pneumonia

In normal circumstances, secretions from the mouth and throat aren't able to enter the lungs because we clear our throat and if secretions do get into our airway, we tend to cough and keep those secretions out of our lungs. This happens constantly without our thinking about it.

After esophagectomy, however, there is a tendency for secretions to enter the airway, and if you can't clear them, there is a risk that pneumonia will set in.

There are two important ways that pneumonia can be prevented:

- Deep breathing
- Walking

91 Deep breathing and coughing

After surgery, it's important to breathe deeply to help your lungs recover after surgery. Deep breathing make the cough more effective and helps clear secretions. After surgery, deep breathing and coughing can be uncomfortable, so controlling your discomfort will be an important part of your recovery.

92 Walking

Walking after surgery is also an important way to help your lungs recover as well. When we walk, it's easier for our lungs to function, and again, it makes the cough more frequently.

93 Preventing Pneumonia

How can we prevent pneumonia? Believe it or not, I can tell who is more likely to develop pneumonia after surgery when I first meet them and shake their hand. Someone with a firm handshake has a lower risk of pneumonia. We think this is because someone with a firm handshake has good muscle tone, and someone with good muscle tone probably has good function of the muscles between the ribs so that they have a nice strong cough and can prevent pneumonia.

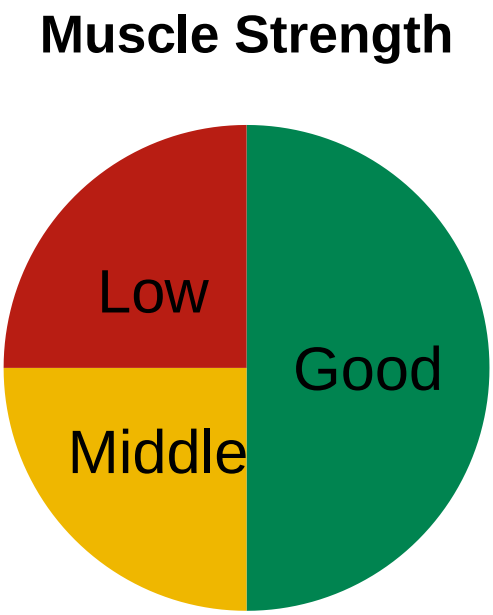
94 Strength

In our clinic, we actually measure out patient's strength with a hand-held strength gauge called a dynamometer. Based upon these measurements, we can identify patients who may be at risk of pneumonia.

95 Patient Strength and Esophagectomy Outcomes

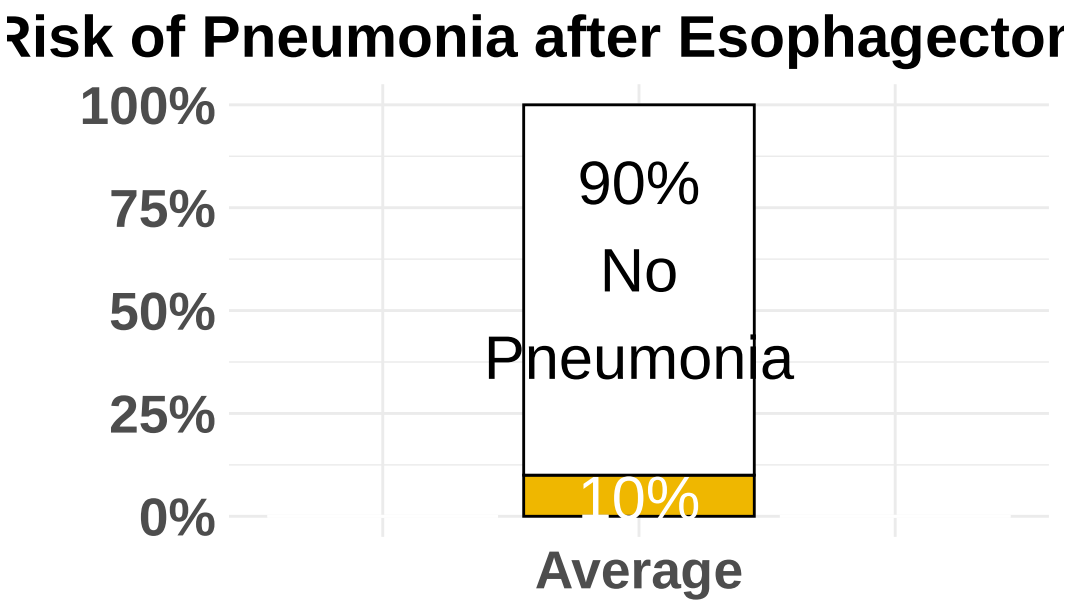
About half of our patients have good strength, shown in green. A quarter are have low strength, shown in red Another quarter are in the middle, shown in yellow

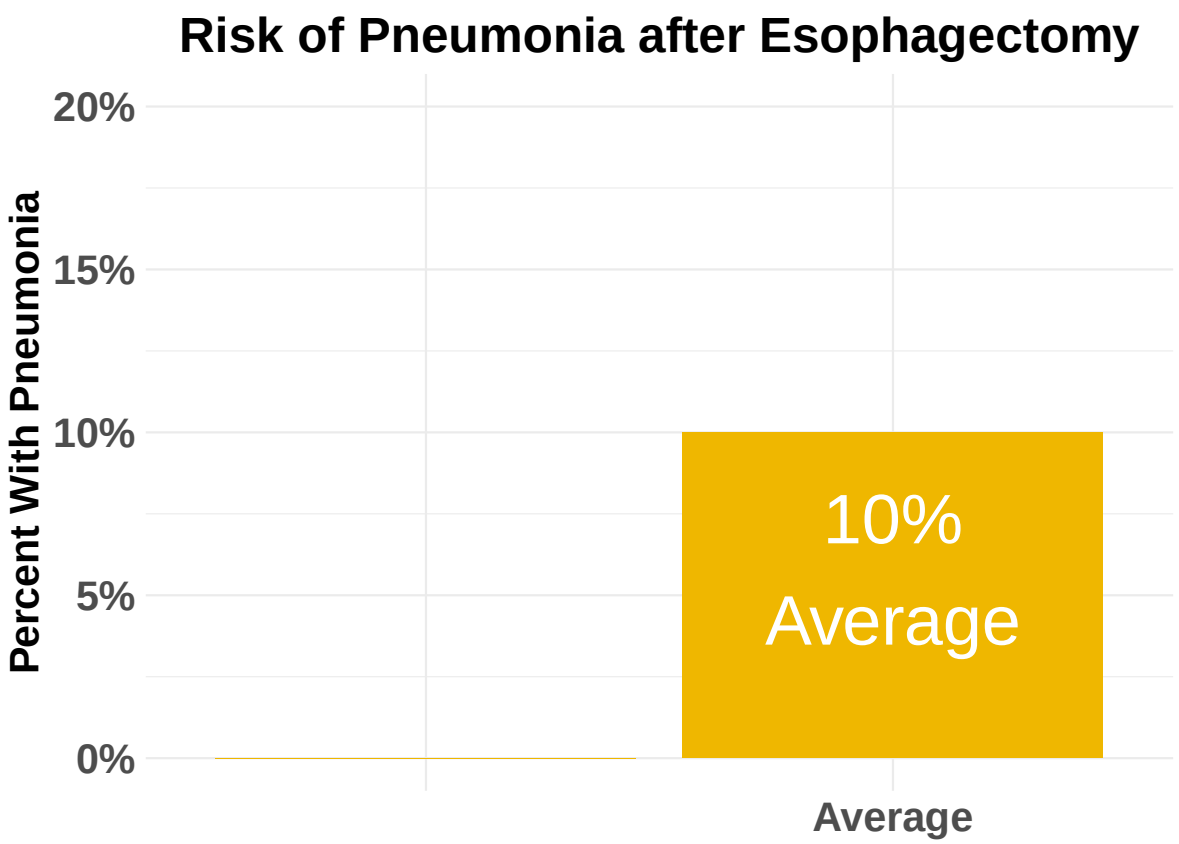
```
Ignoring unknown labels:
* face : "bold"
* size : "14"
```



96 Pneumonia

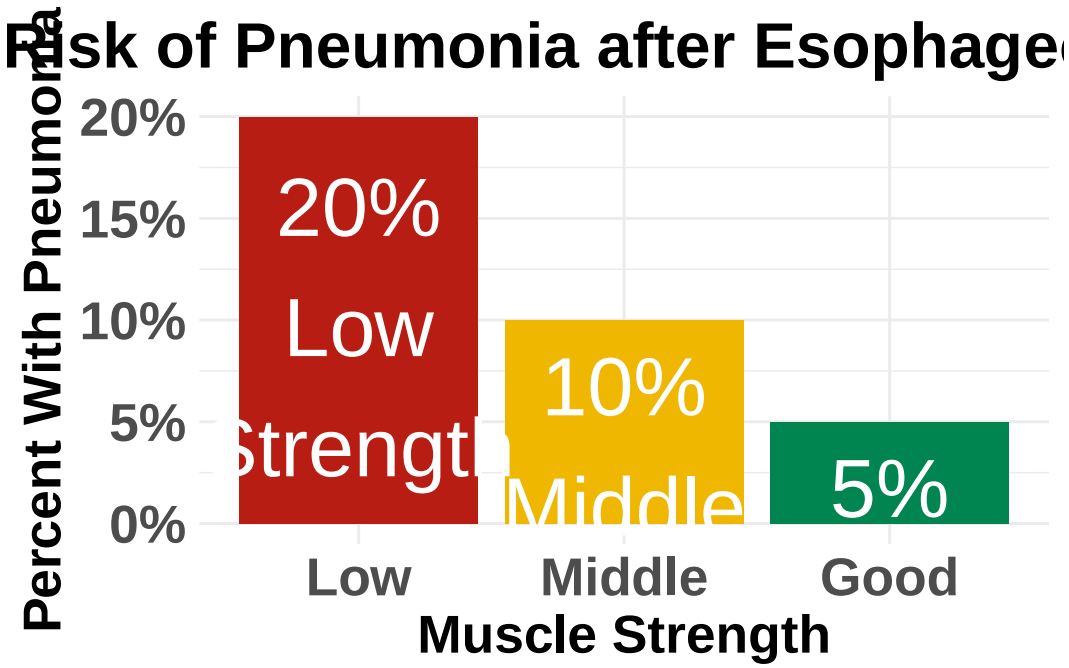
Overall, the risk of pneumonia is about 10% in our patients who undergo esophagectomy. 90% of patients never experience pneumonia, but 10% will have pneumonia after surgery.


Risk of Pneumonia after Esophagector
100%
75%
50%
25%
0%
90%
No
Pneumonia
10%
Average



However the risk of pneumonia is not the same for everyone. Even though the average risk is 10%, the risk is much higher for our patients with low muscle strength and much lower for patients with good muscle strength.

For the half of our patients with good muscle strength, the risk of pneumonia is about 5%. On the other hand, the risk of pneumonia is 20% in the quarter of our patients who have low muscle strength.



97 Muscle Strength and Risk after Esophagectomy

The results of our research suggest a simple answer: The risk of pneumonia is related to a patient's muscle strength.]


We Can Do It!

98

Now this doesn't mean that you need to look like this to prevent pneumonia after your esophagectomy]

The good news is that you can increase your muscle strength before surgery in two very simple ways:

- Good nutrition with adequate intake of protein
- Exercise

99 Good News

with proper nutrition and exercise, you can increase your muscle strength, and we have good reason to believe this will reduce your risk of complications after esophagectomy.

When you meet with your surgery team, be sure to ask them about pain control after surgery and how you can increase your muscle strength.

In the next video in our series, you will learn about how to choose a hospital and a surgeon for esophageal surgery:

Choosing a Hospital and Surgeon for Esophagectomy

We hope you have found this video helpful. This videos and others like it are designed to

educate patients and families about esophageal cancer

and equip them for their discussions with their esophageal cancer care team.

As always, these videos are no substitute for expert medical advice.

Feel free to leave a comment or a question, or if you have suggestions for future videos.