

## Lung Surgery

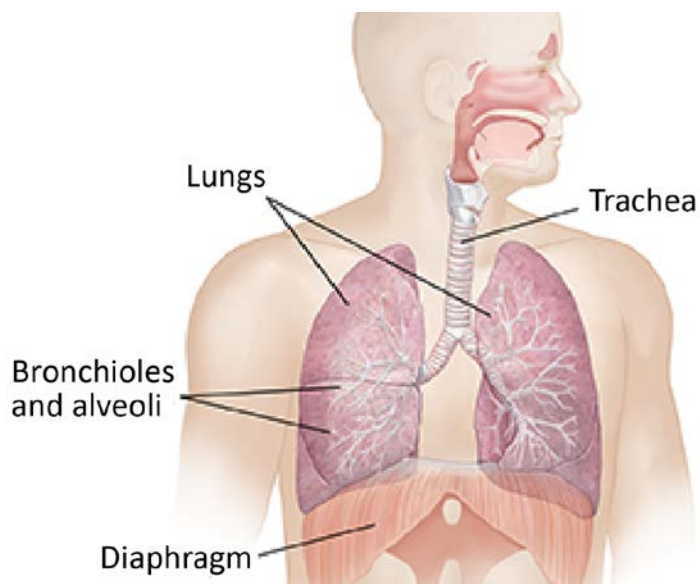
### *What to expect before, during, and after*

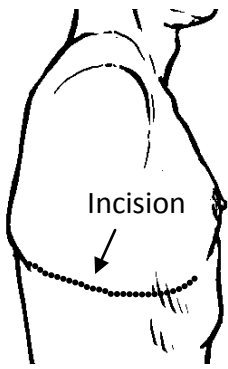
*This handout explains how the lungs work, and what happens before, during, and after lung surgery. It includes self-care at home and follow-up with your doctor after surgery.*

### How Your Lungs Work

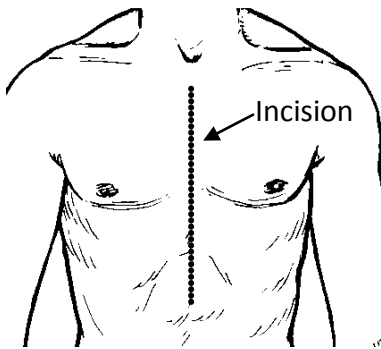
Your lungs are in your *thorax* (chest). The lungs are the main organs in the respiratory system. They bring oxygen into the body. They also remove carbon dioxide (CO<sub>2</sub>), a waste product your body produces as it works. When you breathe in:

- A muscle called the *diaphragm* contracts and moves downward. This increases the space in your chest cavity, and your lungs expand into it.
- The air moves through the *trachea* (windpipe).
- The trachea branches into the right and left *bronchi* (breathing tubes). The smallest branches of the bronchi are called *bronchioles*.
- The inhaled air travels through the bronchioles to groups of very small air sacs called *alveoli*.

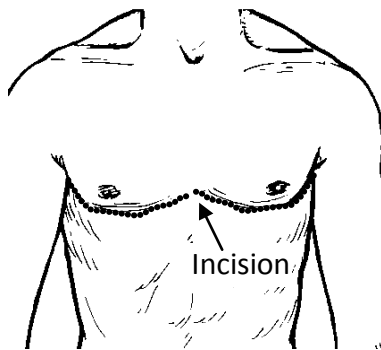




Right thoracotomy incision



Sternotomy incision



Transverse sternotomy incision

- In the alveoli, the inhaled oxygen enters tiny blood vessels called *capillaries*. At the same time, the alveoli take CO<sub>2</sub> from the capillaries. This CO<sub>2</sub> leaves the body as you exhale.

## About Lung Surgery

Lung surgery may also be called *thoracic* surgery. People need this surgery for different reasons. Talk with your doctor if you have any questions about why it is advised for you.

### Types of Incision

In lung surgery, we must open your chest. There are the different types of incisions (see drawings at left):

- **Thoracotomy** is a larger incision on one side of the chest. This opening lets the surgeon see the lung without using a camera.
- **Sternotomy** is used to access both lungs. The incision is vertical, down the center of the chest through the breastbone. This opening lets the surgeon see both lungs directly.
- **Transverse sternotomy** is used to access both lungs. A *curvilinear bilateral submammary* incision looks like a clamshell.
- **Thorascopy** uses several small incisions. The surgeon places a thin tube with a tiny camera through one incision. The camera sends images of your lung to a monitor for your surgeon to view.

Your surgeon will choose the incision method that is best for you.

### Types of Surgery

Your doctor will do one of these types of surgery:

- **Biopsy:** A small piece of lung tissue is removed. It is tested in the lab to find out what type of disease you have.
- **Wedge resection:** One or more small triangular or wedge-shaped sections of the diseased lung is removed. A sternotomy incision may be used if both lungs need resections.
- **Lobectomy:** A lobe of the lung is removed.
- **Pneumonectomy:** An entire lung is removed.
- **Lung volume reduction (LVR):** Sections of the lung are removed to reduce the size of an over-inflated lung. LVR is often used for patients who have *emphysema*.
- **Decortication:** Removing the surface layer (*pleura*) of the lung.

- **Pleurodesis:** The lung membranes (*pleural surfaces*) are made to stick together. This is done to treat recurrent collapsed lung (*pneumothorax*).

## What do I need to do before my surgery?

### Tests

- You will have these tests before your surgery:
  - Blood tests
  - *Electrocardiogram* (ECG)
- You may have these tests, too:
  - Imaging tests of your chest, such as an X-ray
  - *Pulmonary function test* (PFT), if not done already

### Consent Form

We will ask you to sign a consent form. This is your agreement to have the surgery done. We cannot do the surgery if you do not sign this form.

### 48 Hours Before

- Do **not** shave any part of your body that you do not already shave every day. If you normally shave near your surgical site, do **not** shave that area for 2 days (48 hours) before your surgery.

### The Evening Before

- You may have your evening meal as usual. Do **not** drink any alcohol.
- After midnight, do **not** eat or drink anything. If you need to take medicines, you may take them with small sips of water.

### At the Hospital

- At the hospital, we will ask you to sign the consent form if you have not already done this.
- To lower your risk of infection, we will cover you with a heating blanket to warm your body while you wait to go into the operating room. Ask for a heating blanket if you do not receive one.
- We will give you medicine to make you sleep. You will be asleep during your surgery.

- We will place a breathing tube through your mouth and into your trachea. A machine will breathe for you through this tube during your surgery.
- The lung being operated on will be deflated. The breathing machine will help your other lung keep working. We will examine the deflated lung and do the procedure. This may include removing part or all of your lung.
- When your operation is done, we will place a chest tube in your chest cavity (see “After Surgery” on page 5).
- For a sternotomy, the *sternum* (breastbone) is wired back together. The muscles and skin of the rib cage or sternum are closed with stitches or surgical staples.

## Your Healthcare Team

While you are in the hospital, you will meet the members of your healthcare team, either before or after your surgery. Your team may include:

- Your attending doctor
- An *anesthesiologist*, the doctor who will manage your pain during surgery
- Surgical residents, a group of doctors who will assist your surgeon in your care
- Nurses, who will provide nursing care and teaching, and will help with discharge planning
- Physician assistant
- Pulmonary (lung) doctor
- Dietitian
- Pharmacist
- Social worker
- Physical therapist
- Respiratory therapist

## After Surgery

You will wake up in the recovery room. When you are fully awake, you will be moved either to an intensive care unit (ICU) or to a

nursing unit. You will stay in the hospital at least 3 to 4 days. You may stay a week or longer, depending on your recovery.

When you wake up after surgery, you may have:

- An **intravenous line** (IV) in your hand or arm. This small tube allows us to give you fluids and medicines quickly and easily.
- A **catheter tube** that goes into your bladder to drain urine. It will be removed when you can get out of bed to use the bathroom.
- **Chest tubes** that come out of your body through your incision. These tubes drain air, blood, and other fluids that build up in your chest cavity after surgery. They also keep your lungs inflated. Chest tubes may stay in place for a week or longer. They are removed when the drainage and air leakage lessens, and your lungs have healed. (See drawing below.)
- **Sequential compression devices** (SCDs) on your legs. These wraps inflate from time to time to help move the blood from your legs back to your heart. SCDs help prevent blood clots in your legs while you are not moving around much.
- **TED hose** on your legs, which also provide compression to improve blood flow and help prevent blood clots.
- An **epidural catheter**. This tube may have been inserted before surgery to give you pain medicine as needed after surgery.

Right after surgery, you may feel groggy or thirsty. You will be allowed to try drinking when you are fully awake. You will be allowed to eat when your nurse is sure you can swallow.

You may have a sore throat from the breathing tube. This will go away in a few days.

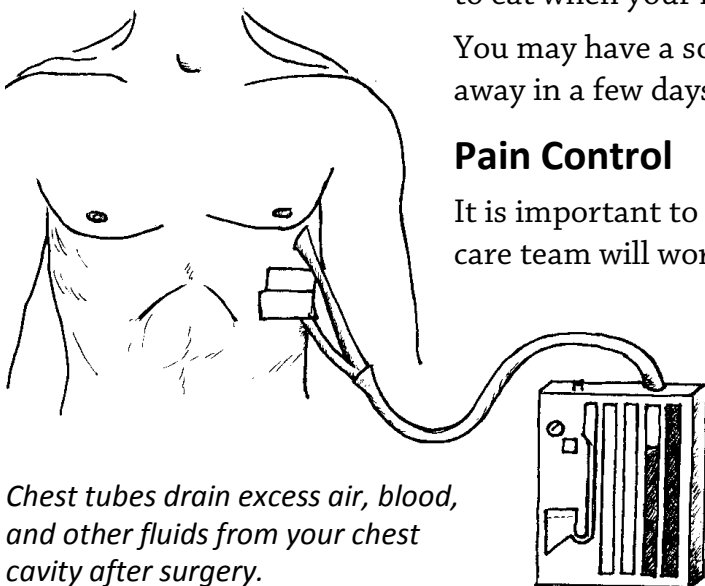
## Pain Control

It is important to have good pain control after surgery. You and your care team will work together to manage your pain.

## Coughing and Deep-Breathing Exercises

Good pain control will help you cough and breathe deeply after surgery. Doing this helps clear mucus and fluids from your lungs, which helps prevent *pneumonia* (lung infection).

When you are in pain, it is very hard to cough and breathe as deeply as you need to.



*Chest tubes drain excess air, blood, and other fluids from your chest cavity after surgery.*

The respiratory therapist and your nurses will show you how to use *incentive spirometer* and *acapella* devices to help clear your lungs. The goal is to repeat these exercises 10 times every hour. It is OK to switch between the 2 devices.

Your nurses will ask you often about your pain, especially when you are doing the coughing and deep-breathing exercises. You will be asked to rate your pain on a scale of 1 to 10, with 1 being little or no pain, and 10 being the worst pain you can imagine.

Be sure to tell your care team about your level of pain. This helps them track your progress and make sure you are getting the right amount of pain medicine. Tell them when you notice that the pain medicine is wearing off, so your next dose can be given before your pain gets too strong.

### **Methods of Pain Control**

There are many ways to control pain. A special team of doctors and nurses, called the Acute Pain Service, may be involved in your care.

You may receive oral pain medicine at first. Or, you may receive pain medicines through a medical device. This can occur in 1 of 2 ways:

- Through your IV line using a *patient-controlled analgesia* (PCA)
- Through an epidural catheter

With a PCA, you can decide when to take the next dose to control your pain level. With an epidural, the pain medicine is given continuously. No matter which method you use, be sure to tell your nurse if you are feeling pain so that your dose can be adjusted.

Many people are worried about becoming addicted to prescription pain medicines. When these medicines are used as prescribed, they will help in your recovery without causing you to become addicted. Ask your nurse if you have any questions or concerns about this.

### **Activities after Surgery**

With good pain control, you should be able to sit in a chair to eat your meals and walk in the hall, with help, soon after surgery. It is important to exercise your arms, especially on the side most affected by the surgery, so that your muscles do not get stiff.

Your nurses will help you slowly increase your activities to include bathing, dressing, and walking by yourself. Moving around helps prevent pneumonia.

## Sternotomy Precautions

If you have had a sternotomy, your breastbone was wired back together. This bone must heal fully before you resume your normal activities. Your care team will teach you about precautions to take.

## Sleeping

It is common for sleep patterns to change after surgery. You may:

- Sleep more than usual
- Have trouble falling asleep
- Wake up during the night
- Have nightmares or intense dreams

Sleep changes may be caused by anesthesia, medicines, and being in a different setting. Once you return home, catch up on your sleep, and return to your normal routines, these sleep issues should ease.

## Nutrition

It is common not to want to eat much after major surgery, but your body needs more calories than usual for healing. We advise you to eat foods that taste good to you in small meals during the day.

## Going Home

Your care team will assess your needs after surgery. If you had a sternotomy, your breastbone must heal fully before you resume your normal activities. Your team will help you and your family prepare so that you can continue to recover at home.

## Activities at Home

For 6 to 8 weeks after surgery, do **NOT**:

- Drive a car.
- Do any activities that might put stress on your incisions. Some of these are golf, tennis, and mountain biking.
- Lift, push, or pull anything that weighs more than 10 pounds. (A gallon of water weighs almost 9 pounds.)

## Medicines

A pharmacist or nurse will review all your medicines before discharge and give you a written schedule of when to take them.

Your pain medicines will be listed “take as needed.” Take them before your pain gets too strong. If you need oxygen at home, hospital staff will arrange this before discharge.

### Incision Care

- Check your incision every day. Call your doctor if you see increased redness, tenderness, swelling, drainage, or opening.
- You may shower 24 hours after your chest tube is removed.
- Do **not** use any lotions on your incisions. Incisions heal best when they are left open to the air. If needed, use dry gauze to cover your incisions.
- After your chest tubes are removed and you become more active, you may have a gush of drainage from the chest tube site. This drainage should lessen over the next few days. You may cover the site with a sterile gauze pad to absorb the drainage and to prevent soiling your clothes.

### When to Call

Call your surgeon or the surgical residents if you have:

- Pain at your incision that is not eased by your pain medicine, or a sudden sharp pain
- Any new drainage from your incision, or the incision opens
- Signs of infection such as pain, redness, tenderness, or swelling
- Fever greater than 100.5°F (38°C) and/or chills
- Increased tiredness, shortness of breath, or fatigue
- Nausea, vomiting, or other conditions that last more than 24 hours and make you unable to take your medicines
- Faintness or feeling of tightness in your chest

### Follow-up Visit

If you are discharged from the hospital:

- **On a weekday:** We will schedule your follow-up visit before you leave the hospital.
- **On the weekend:** Call the Thoracic Surgery PCC (patient care coordinator) at 206.598.1980 the Monday after you leave the hospital to schedule your follow-up visit.

#### Questions?

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

Weekdays from 8 a.m. to 4 p.m., call the Surgical Specialties Nurse Advice Line at 206.598.4549.

After hours and on weekends and holidays, call 206.598.6190 and ask to page the resident on call for Thoracic Surgery.

Or, ask to page your surgeon:

Dr. \_\_\_\_\_