TEXAS ONCOLOGY

More breakthroughs. More victories.®

PATIENT GUIDE TO THORACIC SURGERY

Thank you for choosing Texas Oncology for your care. We appreciate the confidence and opportunity to serve you. Gustavo E. Guajardo Salinas, M.D., provides diagnosis and surgical therapy, specializing in thoracic surgery for cancers and other diseases. He is highly skilled in the latest surgical techniques and he is dedicated to providing patients with personalized, compassionate care. At Texas Oncology in San Antonio, Dr. Guajardo is part of an experienced team of oncologists dedicated to providing leading edge and personalized cancer care to each patient. Our multidisciplinary approach to cancer care allows patients to receive the care and attention they need without the stress of visiting multiple practices and providers.

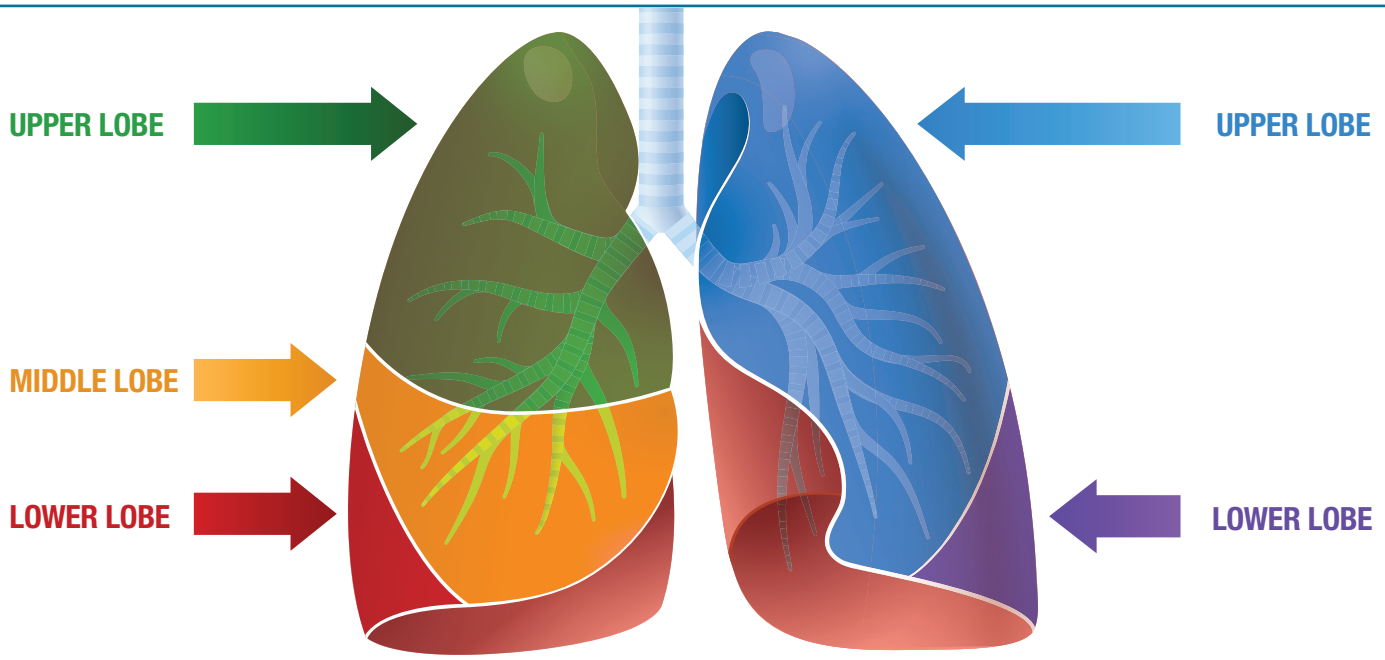
Please do not hesitate to call our office with any questions or concerns:

Surgery Scheduler Direct Phone Number: 210-595-5688

Thoracic Surgery Medical Assistant: 210-595-5300, Ext. 15445

THORACIC PATIENT EDUCATION

Your lungs help you breathe. Your heart pumps blood using the right ventricle (right side of your heart). Once the blood flows through your lungs, oxygen is exchanged into your blood and the oxygenated blood flows back into the left side of the heart and the left ventricle (the muscular left side of your heart) pumps the blood into your body. While you breathe, the carbon dioxide is expelled out of your lungs.



The lungs are divided into different lobes:

- **The right side has 3 lobes (upper, middle and lower)**
- **The left side has 2 lobes (upper and lower)**

Around your lungs there are multiple lymph nodes. The lymph nodes can contain inflammatory cells, infection or cancer cells. During lung surgery, the lymph nodes are usually harvested, removed or biopsied in order to find if there are cancer cells outside the lung.

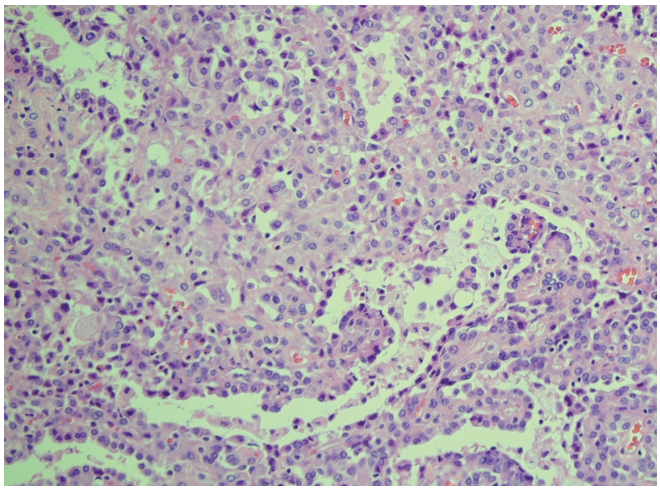
Patients with the following findings might require surgery:

- Abnormal CT scan or X-ray of lungs
- Lung nodules
- Lung cancer
- Lung cavity or scaring
- Blebs or cysts

.

What is lung cancer?

Cancer cells are cells that have lost the ability to control their growth and are abnormal. Cancer can begin in the lungs or can spread from other parts of the body to the lungs in a process called metastasizing. The stage of lung cancer is determined by whether the cancer cells are only in the lung, the lymph nodes or in other organs.



Pathology slide from a lung mass demonstrating abnormal cells

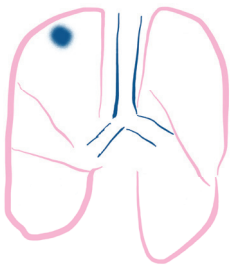
The way doctors report the staging is based on the "TNM" system:

T **What is the TUMOR size?**

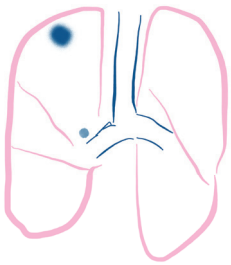
N **Do the lymph NODES have cancer?**

M **Have the cancer cells METASTASIZED outside the lung into other organs or the chest cavity?**

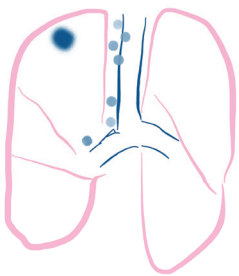
Stages of lung cancer?



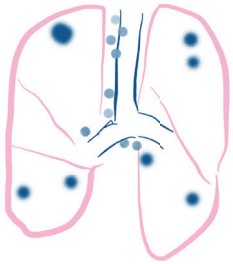
Stage I:
Usually the tumor or cancer is only in the lung in one lobe



Stage II:
The cancer cells have invaded the lymph nodes inside the lobe where the tumor is located



Stage III:
The tumor is bigger than 7 cm or the cancer cells have invaded the lymph nodes around the patient's windpipe (trachea), around the patient's esophagus or great vessels



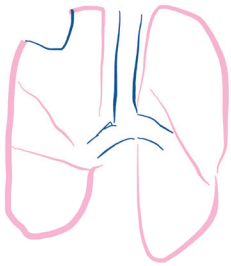
Stage IV:
The cancer cells have invaded other body parts or the chest cavity

LUNG SURGERY

Types of Lung Surgery

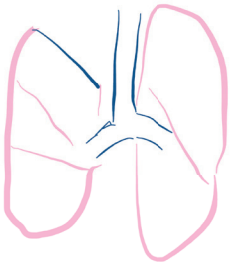
Depending on your lung function and the size of the tumor, your surgeon will remove a small part of the lung, a segment, a lobe or one lung if necessary.

Wedge Resection: A small amount of lung, usually contains the nodule or X-ray abnormality and a small rim of tissue or margin. Once you recover, your chest X-ray will look very similar to before, except without the nodule.



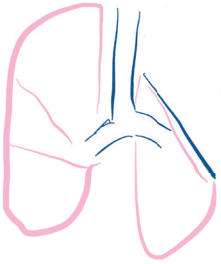
Wedge Resection

Segmentectomy: A larger amount of lung tissue will be removed but smaller than a lobe. Your surgeon will have to identify the blood vessels and airway going into that segment and clip them or cut them.



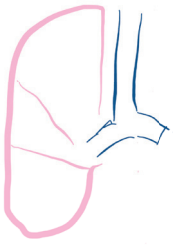
Segmentectomy

Lobectomy: The surgeon will remove one lobe by separating and clipping or stapling the blood vessels and bronchus (airway) going into that lobe. Your chest X-ray will show a smaller lung in the side of the lobectomy but usually your lung will expand to fill up the space and your diaphragm will rise up.



Lobectomy (Left upper lobe)

Pneumonectomy: One lung is removed. This is an uncommon operation, usually done for very proximal tumors that involve the bronchus or airway going into that lung or for very large tumors.



Pneumonectomy (Left)

The standard way to care for patients with early stage lung cancer is a lobectomy, but in patients with poor lung function only a small amount of lung can be removed.

Types of Incisions or Techniques

VATS, RATS or Uniportal Video Assisted Thoracotomy Surgery: This technique is video assisted and usually involves making 1-3 incisions to place a camera and other instruments without spreading the ribs. The procedure varies depending on the surgeon preference and experience and can be performed with robotic instruments or video assisted instruments. All these techniques are considered minimally invasive and every institution and surgeon has a specific approach to either robotic, VATS or Uniportal.

Open Thoracotomy: The incision is usually larger, about 4 to 8 inches depending on the size of the tumor and location. The ribs are spread apart and usually a small piece of rib one centimeter is removed in order to enter the chest. Sometimes some muscle is cut but most times it can be performed preserving the chest muscles. This incision is used for larger tumors or tumors that invade airways or blood vessels.

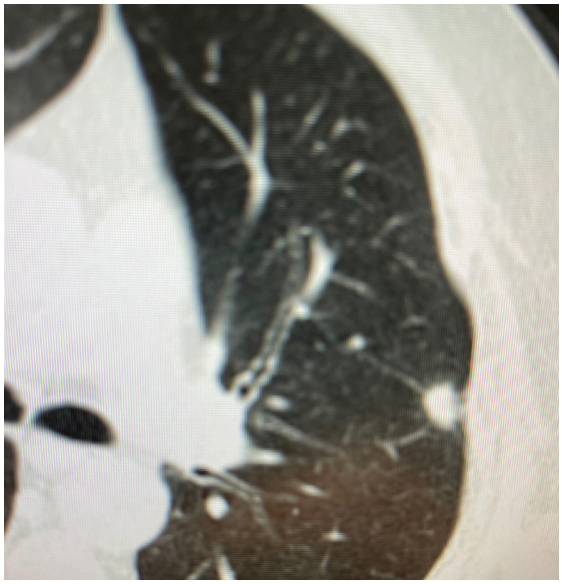
Mini Thoracotomy: This is very similar to an open thoracotomy. The ribs are spread, and it is possible some muscle is cut.

Sternotomy: For tumors involving the center of the chest, the trachea or if there are nodules on both sides of the lungs, your surgeon might choose to enter using a sternotomy. This involves cutting the breastbone or sternum with a saw and then closing it with either plates or wires made of titanium or stainless steel. It is uncommon to do lung surgery using this, but is a common procedure for tumors of the mediastinum or the heart.

TESTING AND STAGING

For your surgeon to complete the staging of lung cancer, plan your operation and evaluate your risk of undergoing surgery, he/she might order the following tests:

- Blood tests
- Electrocardiogram (EKG)
- Echocardiogram (if you are older than 55, have hypertension or history of coronary disease)
- Cardiology consultation (if you have chest pain or you are diabetic and have hypertension or other risk factors)
- Pulmonary function tests and/or pulmonary consultation. This helps your surgeon know how much lung can be safely removed
- Chest CT, PET/CT scan and MRI



CT scan of the chest demonstrating a peripheral lung nodule

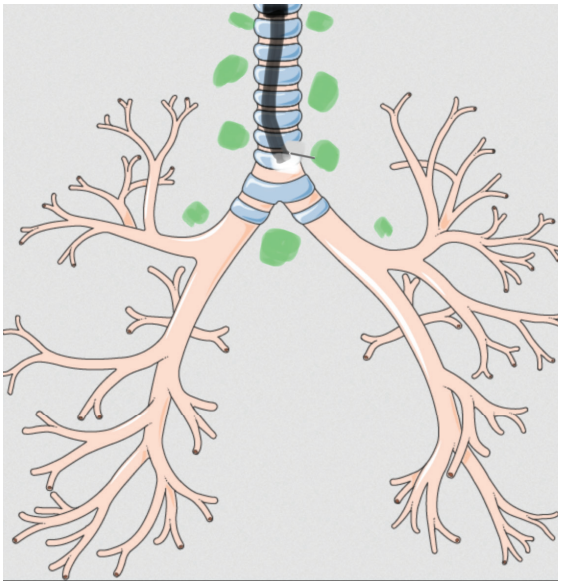
- Chest X-ray (this will help our surgeon and the radiologist compare the X-rays after you have surgery.)

In some patients, despite having multiple images and X-rays, your doctors might order procedures to obtain tissue from lymph nodes or see the extensiveness of the cancer before planning treatment.

The following procedures may be performed in preparation for treatment to complete the staging if your surgeon, pulmonologist, or medical oncologist feel it's necessary.

Bronchoscopy: This involves placing a camera through your mouth or nose down into your trachea or windpipe to look inside and confirm that the tumor has not invaded other parts of your airway and that a lobectomy will be able to completely remove all the tumor.

Endobronchial Ultrasound: This is very similar to a bronchoscopy, but the device has an ultrasound in the tip that can evaluate your lymph nodes. A small needle can be passed through your windpipe to take samples of the lymph nodes.



Endobronchial ultrasound bronchoscopy with needle biopsy of lymph node

Mediastinoscopy: This procedure involves placing a camera outside your windpipe and taking large samples of the lymph nodes or removing the lymph nodes around your trachea. The procedure involves making a small 2-3 centimeter incision at the base of your neck to place the camera. Endobronchial ultrasound and mediastinoscopy are complementary procedures and your doctors will discuss which test can obtain adequate samples based on the location of the suspected lymph nodes.

PREPARING FOR YOUR SURGERY

Before surgery

- If possible, stop smoking completely at least 3-4 weeks before surgery. It will reduce breathing issues postoperative.
- Do not drink alcohol at least 48 hours before surgery.
- You need to arrange for someone to bring you to the hospital and pick you up the day of discharge.
- You will be given a list of medicines to stop before surgery.
- Stay active before surgery, it will help you to be active postoperatively.
- Practice taking deep breaths to help you relax and to keep your lungs as healthy as possible.
- Most patients want to know how long the recovery time is. Every patient is different. Patients spend on average 3-5 days in the hospital after thoracic surgery, but some are discharged earlier and others require staying longer.
- The day before surgery shower with any soap labeled as antimicrobial or the one recommended or given by the preoperative nurses.

Testing before surgery

- Most patients are required to undergo preoperative testing in order to check labs and prevent cancellations the day of surgery. Most patients will also be asked to obtain a chest X-ray for baseline comparison. All these tests are done 1-3 days before in the hospital that you will have surgery.
- Most patients are required to have pulmonary function tests, this will help your surgeon estimate the risk of breathing problems after surgery and plan for surgery accordingly.
- If you have a cardiac history, your surgeon will ask your cardiologist to clear you for surgery or perform testing to estimate your risk of having heart problems after surgery. Most patients have low risk for having heart attacks or arrhythmias, but this does not mean it can't happen.
- Make sure the office and the hospitals know exactly what medications and herbs you are taking. Particularly blood thinners, steroids, diabetes medications and herbs.
- If you are taking aspirin, it is not necessary to stop it for most procedures.
- You will be asked about your allergies to medications multiple times.
- Heart and blood pressure medicines: you will be given a list of medicines that need to be stopped 1-2 days before surgery (ACE inhibitors like lisinopril, enalapril or ARB medications like losartan, cozaar, etc.)

If you have any questions, please call the Surgery Scheduler or the Thoracic Surgery Medical Assistant.

Day Before Surgery Requirements

It is normal to feel nervous before surgery. Continue your life as normal and try to walk and do deep breathing exercises to stay calm and relax.

Leave all valuables at home. Earrings, rings, jewelry, watches, etc.

Food & Drink Guidelines

At 10 p.m. the day before surgery:

- Stop all solid foods and dairy products
- Stop tube feedings
- Ok to continue drinking clear liquids until midnight

After 10 p.m. while you are awake, you can continue to drink water, but we want you to stop four hours before your surgery. If you are diabetic and have low blood sugar, please drink apple juice or a drink containing sugar in a small amount of 1-2 ounces.

Approved list of clear liquids before surgery:

- Apple juice
- Black Coffee
- Clearfast
- Cranberry juice
- Gatorade
- Grape juice
- Pedialyte
- Powerade
- Water

Day of Surgery

- You will be asked to arrive two hours before your surgery.
- Remember there can be surgeries ahead of yours or emergencies and sometimes your surgery will start at a different time.
- Bring your CPAP machine to the hospital if you use one.
- When you arrive at the lobby, you will register, and the receptionist will double check that your insurance has authorized the surgery. Our office requests authorization ahead of time but occasionally the hospital does not receive the authorization number and they will call your insurance to make sure everything is approved.
- After registration, you will be taken to the preoperative holding area and a nurse will meet you. She will ask you about your medicines, allergies and she will check your vitals. They will ask safety questions and give you an identification bracelet and allergy bracelet.
- A consent for the surgery will be given to you. Your surgeon will have already discussed the surgery, the risks, benefits and alternative treatments with you in the office but he/she will go over them again and your surgeon will also sign the consent form.

DAY OF SURGERY

All surgeries present risks and any thoracic surgery is considered major surgery. The risks of surgery include bleeding, infection, pain, heart problems, breathing problems, need to convert surgeries to open procedures, reactions to medications or anesthesia, strokes, blood clots, pneumonia, urinary tract infections, gastrointestinal complications, death and others. Our team makes every effort to keep you safe and prevent complications, but complications can arise during your hospital stay or during surgery despite our best efforts to prevent them. Your risks vary depending on your other medical conditions, level of activity, history and medications.

- Your surgeon will tell you an approximate duration time for surgery. On average lung surgeries last approximately three hours, esophageal surgeries last approximately four hours and outpatient procedures last less than one hour. Remember that every patient is different and unexpected findings or anatomy can make surgeries longer.
- At the end of surgery, your surgeon will call your family member or go out to the waiting area and discuss the operation outcomes and findings with your family member.
- Your recovery and hospital course will be updated daily to your family at bedside and before you go home you will be given instructions.

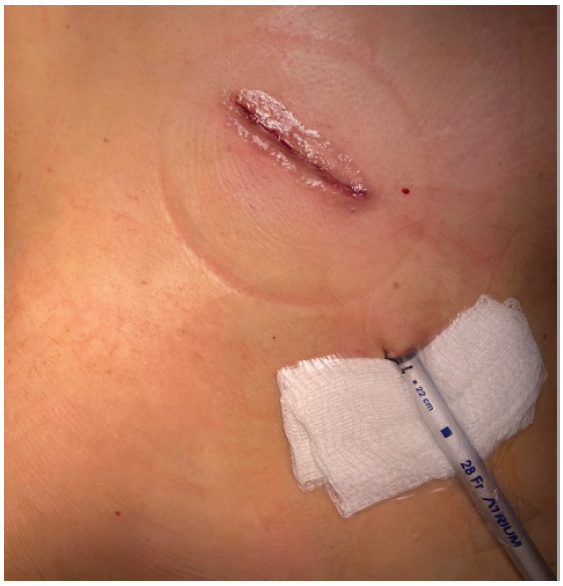
HOSPITAL STAY

Expectations for Your Hospital Stay

- During your hospital admission you will be seen by your surgeon, by a hospitalist and sometimes by a pulmonologist and a cardiologist if needed.
- After surgery, you will go to the recovery unit, postanesthesia care unit (PACU), or intensive care unit (ICU). A new nurse will meet you and take care of you. Most patients spend about 2-4 hours in the recovery room and then they are given a room. Once they are in their room, their family member can be with them. For patients in the ICU, your nurse will draw blood and make sure all your medicine is given and that you are stable before calling your family to let them come see you.
- Your surgeon will usually see you early in the morning, but the hospitalist and other doctors will come at different times during the day.
- Almost every thoracic surgery patient will have drains or chest tubes. These tubes are left in place to drain blood, air or fluid from your chest cavity. Once your surgeon feels it is safe to remove them, he will remove them at bedside.
- You will be given an incentive spirometer to practice deep breathing and you need to do it at least 10 times every hour.

Incentive Spirometer

- You are expected to walk and be out of bed the first day after your surgery. It is extremely important that you walk, do deep breathing exercises and cough secretions to recover quickly and avoid problems like pneumonia or other complications.
- You will be given anti-inflammatory and pain medications. It won't completely remove the pain, but will make the pain tolerable.
- Do not attempt to walk alone in the hospital; always notify your nurse. We want to prevent falls. Physical therapy and your nurse will help you walk. When going to the restroom, also alert your nurse; it is easy to get tangled with IV lines and chest tubes and fall.



Chest tube incision and drain tube

RETURNING HOME

Expectations for Discharge From the Hospital

- For patients to be ready for discharge, they need to be off oxygen or set up for home oxygen, tolerating food and taking only oral pain medications. They also need to have their chest tube removed before going home. Occasionally some patients will go home with a chest tube if needed.
- Before you go home, be sure you have been given a prescription for pain medication or that your family member is able to pick it up. You don't want to get home after hours when the pharmacy is closed and not have pain medication.
- A case manager will review your chart and follow your case. He or she will help with necessary equipment for home, setting up rehabilitation or other patient needs.
- After your surgeon has cleared you for discharge, the nursing staff will contact your other doctors and make sure they feel it is safe for you to be discharged. This takes about two hours.
- You will be given a written list of medications to take or to continue during your discharge and your nurse will go over them with you. For the most part, most patients go back on all their home medications and we add pain medications to that.

Expectations for When you get Home

- You will be set up for an appointment 2-3 weeks after your surgery. You need to see your surgeon to make sure you are healing properly and you have no issues. Your surgery scheduler at the office will set up your appointment even before you have your surgery if you need to reschedule please let him/her know.
- Every patient that has esophageal or lung surgery usually requires a chest X-ray two weeks after surgery and before their follow up. The X-ray helps your surgeon make sure you are not building fluid in your chest cavity and that your lung has expanded well.
- If your chest tube incision is leaking fluid, this is expected and common after removing your chest tube. Try not to place tape or gauze around it. You can use a towel to keep your clothes dry. The drainage usually stops in 24-48 hours In some patients it might last longer, please let your surgeon know.
- Your chest tube dressing can be removed after 24 hours, if you're still having fluid drainage, you can keep it on up to 72 hours.
- You will feel tired for several weeks after surgery so please plan accordingly.

When to Call Your Surgeon

- Shortness of breath
- Your legs are swollen
- Your pain is not controlled with pain meds and is constantly above a six on the pain scale
- Your incision is red
- No bowel movements for 2-3 days
- Fever is greater than 101.5° F
- You feel your heart racing, or your heart is beating very fast

Reasons to Return to the Hospital/ER

- You can't catch your breath, or you can't lay down due to shortness of breath that is new
- You have severe chest pain or crushing chest pain
- Fever is greater than 103° F
- You passed out
- Nausea and vomiting and unable to keep any liquids down
- Stroke-like symptoms

ACTIVITY AFTER SURGERY

Returning to Activities After Surgery

Driving: Do not drive if you are taking opioid pain medication.

Sleep: You will get tired and want to sleep quite often after you get home. This is normal and will last only for the following few weeks after surgery.

Walking: It is okay to walk every day. Every patient is different, and the amount of walking tolerated is different. If you are not short of breath and enjoy walking, continue walking. Try not to walk in the hot sun, as you could pass out. Avoid prolonged sitting or your legs will swell and slow your recovery.

Medication: Take your pain medication as instructed. Do not wait until the pain is severe to take it. It is difficult to control the pain like that. If you have normal kidneys, no stomach ulcers, and no allergies to it, you can take anti-inflammatory medication like Advil, Motrin or Aleve and alternate them with your opioid medication.

Showers: You can take a shower 24 hours after your chest tube has been removed. If you have a chest tube at home, you need to cover the site.

Baths: Do not take baths or swim until all your wounds are completely healed. It usually takes three weeks and it is after your post operation visit.

Breathing exercises: Use your incentive spirometer every day after you get home. The volume should stay constant and get better, not worse. If your volume gets lower than when you left the hospital, call your surgeon.

Lifting: Do not lift more than five pounds or a gallon of milk for the first 4-6 weeks. Straining can slow down the healing process.

Coughing: Use a pillow under your arm and squeeze it in order to cough. This will help with the pain and allow you to cough more efficiently.

Sexual activity: You can resume when you feel comfortable.

Return to work: Discuss with your surgeon during your follow-up appointment.

Traveling: Discuss with your surgeon before flying. Avoid long car trips that are more than two hours long. If necessary, make frequent stops and walk.

YOUR CARE TEAM

Thoracic Surgeon: The surgeon that will perform the operation and oversee your care.

Assistant: The surgeon, assistant or resident that will help your surgeon during the operation.

Anesthesiologist: The physician that will put you to sleep and monitor you while your surgeon performs the operation.

Hospitalist: An internal medicine specialist that will co-manage your care during your hospital stay. They are usually on the floor of the hospital most of the day. They will care for you when your surgeon is doing other operations or working at a different hospital. They will help your surgeon with discharge orders/medications/process.

Surgery Scheduler: Office staff that will schedule your surgery, provide all instructions, help you with questions and follow up appointment.

Thoracic Medical Assistant: The medical assistant that works closely with your surgeon, helps during clinic and is the point of contact for patients for questions or issues.

Surgical Tech: The tech that will pass all the instruments to the surgeon during your surgery.

Registered Nurse: You will have several different nurses during your hospital stay: pre-operation, intra-operation and post-operation.

Physical Therapist: They will assist you and help you walk and exercise post-operation.

Respiratory Therapist: They will provide you with breathing treatments and teach you how to use incentive spirometer.

Case Manager: Will help you plan for discharge needs.

My References

1. Texas Oncology
   www.texasoncology.com
2. American Cancer Society
   www.cancer.org
3. American Lung Association
   www.lung.org
4. National Cancer Institute
   www.cancer.gov/types/lung
   www.cancer.gov/types/esophageal
5. National comprehensive cancer network
   www.nccn.org
6. The Society of Thoracic Surgeons
   www.sts.org/patients
7. The US Oncology Network
   www.usoncology.com/patients/resources/

TEXAS ONCOLOGY

More breakthroughs. More victories.®