



Thoracic surgeons at the UPMC Heart, Lung, and Esophageal Institute share their services with the UPMC St. Margaret Lung and Thoracic Diseases Center. These board-certified thoracic surgeons also are affiliated with UPMC Cancer Centers. The focus of the thoracic surgical team is to enhance the cancer patient care process by involving and collaborating with primary care physicians, pulmonologists, gastroenterologists, and oncologists at UPMC St. Margaret.

Thoracic Surgical Services

Our surgeons are especially interested in using minimally invasive approaches to treat benign and malignant diseases of the chest and esophagus. As pioneers in this approach, they were among the few in this country to use minimally invasive techniques to treat lung and esophageal cancer and benign esophageal diseases, such as gastroesophageal reflux disease (GERD) and achalasia.

Lung Cancer

Lung cancer is one of the most virulent cancers faced by men and women. The American Cancer Society estimates that in the year 2007 approximately 213,000 new cases of lung cancer will be diagnosed in the United States. Of these diagnoses, 80 percent of all new cases will occur in former or active smokers. Therefore, keeping non-smokers away from latching onto this habit and encouraging smokers to quit are two of the most important measures we can take to reduce the occurrence of lung cancer.

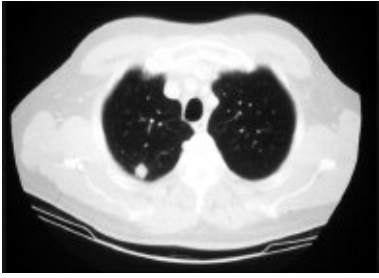
Lung cancer presents as two primary subtypes: small cell (or oat cell) cancer and non-small cell cancer. About 20 percent of lung cancers are small cell with the remaining cases classified as non-small cell cancers. This classification distinction is important because medical and radiation therapies are the two primary treatments for small cell lung cancer. Although these treatments are also frequently used for non-small cell cancer, surgical removal of the tumor is considered primary treatment for early stage non-small cell cancers (Figure A).

When treating a patient, diagnosing and determining the stage of the lung cancer is a primary concern. It requires a detailed radiographic evaluation and also may require a bronchoscopic biopsy performed by the pulmonary physician team or thoracic surgeons. A needle biopsy also may be required to obtain a diagnosis of a suspicious lung lesion. Additionally, our thoracic surgeons may be asked to perform a minimally invasive biopsy of the lung lesion or of suspicious lymph nodes around the trachea.

Using this complete approach to evaluate the patient's disease improves our understanding of the problem and aids the multidisciplinary treatment team in determining the best treatment for the patient. The cooperative "real time" interaction of the medical physicians and thoracic surgeons at the Lung and Thoracic Diseases Center results in timely care; it also helps to establish the best treatment plan for the patient.

At the Lung and Thoracic Diseases Center, our surgeons are recognized as national leaders in the area of minimally invasive thoracic surgery (Figure B).

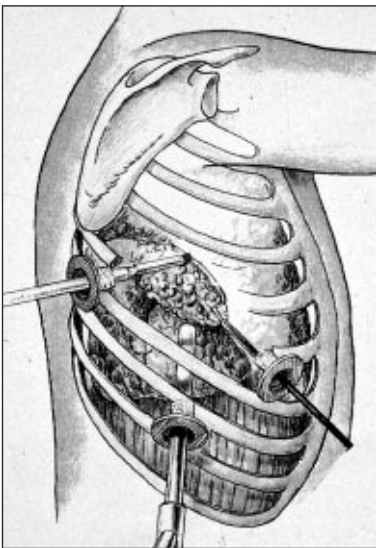
When surgical resection of a patient's cancer is considered the best treatment option, the center's thoracic surgeons use minimally invasive (television camera-directed) approaches as the primary means of removing the lung cancer. Such approaches may result in less post-operative pain and may lead to a faster recovery and a shorter hospital stay. While the majority of our patients can benefit from these minimally invasive surgical approaches, some tumors are of a size and extent that require open surgery. When this is the case, our surgeons take care in keeping incisions to a minimal size.



A. Lung cancer on CT scan

For patients who are truly inoperable or have had cancer spread from other organs to their lungs, the use of radiofrequency ablation or cryotherapy may be options to remove the lung tumor. These approaches involve the placement of a probe in the tumor after the patient has been sedated. The tumor is then treated with electrical heat energy or sub-zero cold and then directed through the probe (Figure C).

If a patient's tumor requires more than surgery, our thoracic surgeons will work closely with the center's medical and radiation oncologists to create a treatment plan. This plan may include chemotherapy and possibly radiation therapy. The center's thoracic surgeons have the most experience in the region with this type of therapy approach.



B. Minimally invasive thoracic surgery

Esophageal Cancer

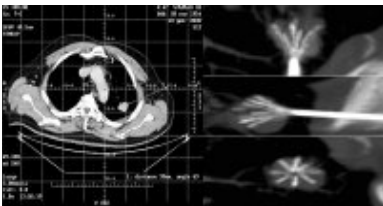
The occurrence of esophageal cancer is rising in America faster than almost any cancer today. The increasing diagnoses are suspected to be a result of American dietary habits and the growing problem of gastroesophageal reflux disease (GERD), which leads to a chronic injury of the esophagus. This injury may only be partially controlled with medications. However, in fighting and treating esophageal cancer, our best chance is removing the cancer while the disease is in an early stage.

Unfortunately, many patients are diagnosed with the disease only after their cancer has advanced.

Patients with cancer that has not yet spread are candidates for surgical resection. Our thoracic surgeons have extensive experience in the surgical management of esophageal cancer and have led the way, with other UPMC thoracic surgeons, in minimally invasive surgical approaches to esophagectomy. Their surgical results rank among the best in the country.

When the cancer is considered locally advanced, it is common for the thoracic surgeons and oncologists to establish a plan of chemotherapy with possible radiation therapy prior to possible esophageal resection. In these circumstances, the multimodality approach to the patient's disease appears to provide the best outcome for the patient. When the esophageal cancer cannot be removed, the thoracic surgeons at the center often are able to prevent or reduce swallowing difficulties with laser therapy, esophageal dilation, or endo-esophageal stenting procedures.

To prevent further weight loss in esophageal cancer patients, the Lung and Thoracic Diseases Center works closely with UPMC St. Margaret nutritional services. This collaboration assists our patients in maintaining their general health and nutrition throughout their treatments.



C. Radiofrequency ablation

Benign Esophagus Disorders (GERD and Achalasia)

GERD affects more than 25 million Americans. Symptoms of GERD include heartburn, regurgitation, and cough during or after eating. Many patients with this problem are affected by an associated hiatal hernia and defective function of the muscular valve between the lower esophagus and upper stomach (Figure D).

GERD patients who do not find relief with a period of medical management, and patients who require chronic management, should consider a minimally invasive approach that corrects the hiatal hernia and creates an effective gastroesophageal junction valve. This valve is created by pleating the upper, floppy part of the stomach around the lower esophagus to create a "flutter valve" mechanism, which prevents abnormal reflux. This procedure is called fundoplication (Figure E).

The thoracic surgeons at the Lung and Thoracic Diseases Center are greatly experienced in the minimally invasive approaches to GERD. A hospital stay may be less than two days and patients may be able to quickly resume normal activity.

Another benign, esophageal condition that can be surgically treated is achalasia. The primary symptoms associated with esophageal achalasia are difficulty swallowing, regurgitation, nutritional deficiency with weight loss, and pulmonary symptoms of cough, and aspiration. Achalasia occurs when the lower esophageal muscular barrier above the stomach is unable to relax after swallowing.

The surgical therapy for achalasia is dividing the spastic musculature between the lower esophagus and stomach. This division allows food and liquids to pass into the stomach from the lower esophagus more freely. In some cases, dilation of the esophagus is an alternative to surgery. The center's thoracic surgeons were among the first in the country to perform a minimally invasive esophagomyotomy to correct esophageal achalasia.

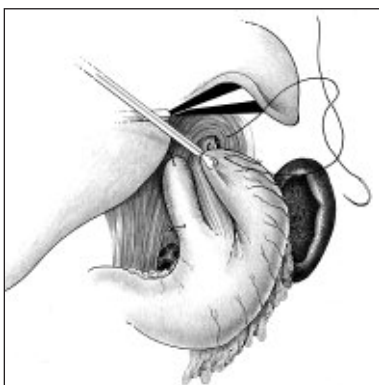
Mediastinal Problems (Thymomas, Myasthenia Gravis, Neurogenic tumors, and lymph node enlargement, and intra-thoracic thyroid goiter)

The mediastinum is the medical term for the anatomic structures in the middle of the chest. These include the tissues and lymph structures around the trachea, heart, and spine. Conditions affecting these structures include diseases such as thymoma, myasthenia gravis, tumors of nerve origin (neurogenic), lymphoma, and Hodgkin's disease.

A lymph organ, the thymus gland is critical in the development of immunity for children in the womb and during childhood. The thymus gland tends to reduce in size and function as we age. Tumors of the thymus are known as "thymomas."



D. Image of hiatal hernia and resulting reflux



E. Fundoplication procedure

For removing limited thymomas, surgery is preferred. Another condition involving the thymus gland is the muscular weakness condition known as myasthenia gravis. Over the last several years, it has been noted that removing the thymus gland has improved the muscular conditions of myasthenia gravis patients.

Our surgeons are among an elite few who focus on removing the thymus gland, for both management of tumors and treatment of myasthenia gravis, using a minimally invasive approach. Results using this approach have been outstanding. Dividing the patient's breastbone may be avoided and the amount of recovery time may be reduced.

Neurogenic tumors and mediastinal lymph node enlargement also can be surgically treated. Often, a biopsy of an enlarged, mediastinal lymph node is necessary to identify or rule out such diseases as lymphoma and Hodgkin's disease. The biopsy is an outpatient procedure known as mediastinoscopy.

Rarely, a thyroid goiter can grow in the upper mediastinum. This growth may result in a compression of the airway, esophagus, or major blood vessels. When this condition occurs, it is important to remove the thyroid mass to rule out malignancy and also to prevent further compression.

Pleural Disease and Mesothelioma

Developing fluid in the chest is a common problem that may be corrected by our thoracic surgeons. This fluid may be the result of inflammation from recent pneumonia, fluid shifts related to heart, liver, or kidney diseases, or from tumors in the chest cavity. Properly diagnosing the source of this fluid is necessary in providing therapy for the patient and improving the patient's breathing.

Our surgeons use a minimally invasive approach to offer a diagnosis. These approaches may lead to a quick recovery and also may allow for a more immediate treatment of the underlying cause of the pleural fluid buildup.

When the cause of the pleural fluid buildup is related to infection or inflammation, the center's pulmonologists and infectious disease specialists are consulted. If the fluid is related to tumor involvement, our medical oncologists are immediately brought into the patient's care plan to ensure that complete care is provided.

Mesothelioma is a malignant pleural problem with increasing occurrence in our area. The cause of this disease appears to be related to asbestos exposure in the environment. Symptoms of mesothelioma include shortness of breath and chest pain. In order to properly manage mesothelioma, all of our center's specialists must work together to optimize the patient's chances with this malignancy. Surgery is a treatment option for mesothelioma.

Airway Obstruction

Chest, lung, and esophageal tumors can grow, in time, to obstruct airway passages. To relieve the obstruction and prevent bleeding or pneumonia, endobronchial therapy is often required. This therapy uses special laser devices and endobronchial stenting to remove endobronchial tumors and maintain clear airways. On occasion, the use of endobronchial radiation therapy is used to kill tumor cells that are obstructing the airway. Our center's thoracic surgeons, pulmonologists, and radiation oncologists have considerable experience, interest, and reported success using these treatment options.

Hyperhidrosis, Raynaud's, and Posttraumatic "Causalgia" of the Upper Extremity

Upper extremity and axillary hyperhidrosis, or excessive sweating, are conditions that can result in significant dermatologic, functional, and social disability for the patient. A variety of medical treatments are available for this problem; however, the results are only reliable on a case-by-case basis.

Minimally invasive thoracodorsal sympathectomy is a reliable surgical treatment of this problem, having a success rate well over 95 percent in the hands of our thoracic surgeons. This procedure involves the use of two small incisions in the armpit area and the clipping of the nerves specifically controlling sweat production and blood vessel tonicity to the upper extremity and armpit area. The procedure is commonly an outpatient procedure. While most patients are extremely pleased with their results, it is important to note that increased sweating in other areas may occur after surgery.

Other patients who may benefit from this clipping of selected nerves are people who suffer from post-traumatic "causalgia" of the upper extremity. This pain syndrome may result from seemingly minor trauma to the upper extremity. Clipping of the sympathetic nerves to the affected upper extremity can significantly improve this condition. Our thoracic surgeons work closely with the anesthesia pain service of UPMC St. Margaret to evaluate, diagnose, and medically treat patients.

Finally, patients who are dealing with significant medically-resistant Raynaud's symptoms also may benefit from this minimally invasive sympathectomy procedure. The clipping of the sympathetic nerves that control blood vessel constriction to the hands can relieve the blood vessel spasm and improve blood flow to the patient's fingers.