# THORACIC SURGERY ROTATION

# LOYOLA UNIVERSITY MEDICAL CENTER

# FIRST YEAR FELLOWS

Provided below are the specific educational objectives, and clinical skill acquisition goals for residents within the Loyola University Medical Center Residency Program in Thoracic Surgery. The program is under the auspices of the Residency Review Committee for Thoracic Surgery of the Accreditation Council for Graduate Medical Education (ACGME), and supported by faculty and staff within the Department of Cardiovascular and Thoracic Surgery.

Learner Objectives will be taught / learned through various means including:

* The TSDA (Thoracic Surgery Directors Association)
* Comprehensive Requisite Thoracic Surgery Curriculum
* Didactic and other conferences
* Perioperative and operative management
* Self-education and reading
* Faculty demonstration of ACGME core competencies coupled with resident counseling on a daily, or as needed, basis

EVALUATION

Evaluation of the Thoracic Surgery Resident’s understanding of the topic will be reviewed (in part) at the time of operation, or resident-faculty interaction, which exemplifies these topics. Feedback will be verbal and immediate. Faculty will evaluate the Thoracic Surgery Residents based upon stated objectives as part of the ACGME core competencies. These portions of the curriculum will be viewed as “Medical Knowledge” and “Patient Care [e.g. operative skills, and perioperative management, etc.].

Faculty will evaluate residents at the end of the rotation, in writing, based upon these objectives and the ACGME core competencies. Additional evaluations will be conducted for operative skill performance (faculty evaluating residents), and operative skill education (residents evaluating faculty). The remaining core competencies will be taught and evaluated as per the Goals and Objectives for Thoracic Surgery

Residents. Residents will evaluate faculty teaching and education efforts as well as the rotation. Both will occur at the conclusion of the rotation. The program will be evaluated annually. Questions or comments can be directed to the Residency Coordinator or to the Program Director.

EVALUATION INSTRUMENTS

The evaluation instruments are completed in the GME System. The evaluation instruments include:

* Faculty evaluation of Resident
* Resident evaluation of Faculty
* Resident evaluation of rotation
* Resident evaluation of program
* Daily feedback from faculty to resident
* Didactic lectures
* Patient care settings
  + Operating room
  + Intensive care unit
  + General care wards
  + Outpatient clinics
  + Other
* Non-patient care settings
* Other
  + Review of inservice training exam results
  + Review of performance on TSDA curriculum Topic Quizzes

OTHER COMMENTS / RESPONSIBILITIES

Daily rounds and patient care responsibilities will be assigned specific to the individual service. In general for the Adult Services, daily rounds will include the General Care Wards and the Intensive Care Unit at Loyola University Medical Center.

Our residents are required to participate in

* Weekly TSDA Curriculum Conference
* Weekly Departmental Conference, including specialized conferences such as:
  + Monthly Journal Club
  + Monthly Mortality and Morbidity Conference
  + Monthly Clinical Decision Making Conference
  + Congenital Anatomy Human Specimen Lab
  + Grand Rounds
* Weekly Multi-Disciplinary Thoracic Conference
* Quality Improvement Conference
* Additional rotation specific didactic conferences

Residents are required to attend the Weekly Tuesday Thoracic Clinic, and the Weekly Friday Lung Transplant Clinic.

GOALS AND OBJECTIVES ORGANIZED BY CORE COMPETENCY

The following are specific goals and objectives of the training rotation, organized by clinical core competency, as outlined by the ACGME. Where relevant, goals and objectives related to the activities listed above are provided to illustrate the attention paid to the competency during this rotation. The list is not meant to be exhaustive.

**IV.A.5.b) Medical Knowledge**

**Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioral sciences, as well as the application of this knowledge to patient care. Residents:**

**IV.A.5.b).(1) will know current medical information, and critically evaluate scientific information;**

Medical Knowledge (Learner Objectives) and Clinical Skills (Patient Care) follow. This list is meant to be a starting point for the Thoracic Surgery Resident and is not meant to preclude additional reading or independent study nor limitation of time within the operating room, general care wards, or the outpatient clinic.

**CHEST WALL**

**Anatomy and Physiology**

*Learner Objectives:* Upon completion of this unit the resident:

* Recognizes the anatomy and physiology of the cutaneous, muscular, and bony components of the chest wall and their anatomic and physiologic relationships to adjacent structures;
* Identifies all operative approaches to the chest wall;
* Describes the anatomy of the vascular, neural, muscular, and bony components of the thoracic outlet;
* Identifies the surgical anatomy, neural, vascular, and skeletal components of the chest wall, as well as the major musculocutaneous flaps.

*Clinical Skills:* During the training program the resident:

* Recognizes the normal and abnormal anatomy of the chest wall;
* Reads and interprets tests to diagnose chest wall abnormalities;

**Acquired Abnormalities and Neoplasms**

*Learner Objectives:* Upon completion of this unit the resident:

* Evaluates and diagnoses primary and metastatic chest wall tumors, knows their histologic appearance, and understands the indications for incisional versus excisional biopsy
* Discusses the radiologic characteristics of tumors;
* Describes the diagnosis and management of various chest wall infections;
* Can identify the types of chemotherapy and radiotherapy (induction neo-adjuvant and adjuvant therapy) of chest wall tumors and the indications for preoperative and postoperative therapy;

*Clinical Skills:* During the training program the resident:

* Executes a variety of surgical incisions to expose components of the chest wall and interior thoracic organs;
* Executes surgical resections of primary and secondary chest wall tumors;
* Identifies the need for major flaps of the chest wall;

**LUNGS AND PLEURA**

**Anatomy, Physiology and Testing**

*Learner Objectives:* Upon completion of this unit the resident:

* Discusses the arterial, venous and bronchial anatomy of the lungs and their inter-relationships;
* Describes the lymphatic anatomy of the lungs, the major lymphatic nodal stations, and lymphatic drainage routes of the lung segments;
* Recognizes the indications for different thoracic incisions, the surgical anatomy encountered, and the physiological impact;
* Recognizes the indications for plain radiography, CT scan, magnetic resonance imaging, and PET scanning for staging of lung cancer;
* Identifies the indications, interpretation, and use of nuclear medicine ventilation /perfusion scanning (V/Q scan) to determine the operability of candidates for pulmonary resection;
* Discusses the methods of invasive staging (e.g., mediastinoscopy, Chamberlain procedure, scalene node biopsy, thoracoscopy);
* Recognizes how to interpret pulmonary function tests;
* Recognizes the segmental anatomy of the bronchial tree and bronchopulmonary segments;
* Discerns how to perform pulmonary function tests.

*Clinical Skills:* During the training program the resident:

* Reads and interprets pulmonary function studies, ventilation/perfusion scans, pulmonary arteriograms and arterial blood gases, and correlates the results with operability;
* Applies knowledge of thoracic anatomy to the physical examination of the chest, heart, and vascular tree;
* Uses knowledge of chest, pulmonary, and cardiac physiology to interpret tests involving the thoracic cavity and to understand and treat diseases of the chest and its contents;
* Reads and interprets plain radiography, CT scans, magnetic resonance imaging, and PET scanning of the chest;
* Applies knowledge of thoracic anatomy to flexible and rigid endoscopy;
* Contributes in the performance of exercise tolerance tests and pulmonary function tests.

**Non-Neoplastic Lung Disease**

*Learner Objectives:* Upon completion of this unit, the resident:

* Comprehends diagnostic procedures used to evaluate non-neoplastic lung disease;
* Identifies the common pathogens that produce lung infections, including their presentation and pathologic processes, and knows the treatment and indications for operative intervention;
* Describes the natural history, presentation and treatment of chronic obstructive lung disease;
* Discusses the pathologic results and alterations of pulmonary function due to bronchospasm
* Describes the mechanisms by which foreign bodies reach the airways, how they cause pulmonary pathology, and the management of patients with airway foreign bodies;
* Recognizes the indications for bullectomy, lung reduction, and pulmonary transplantation;
* Describes the principles of surgical resection for non-neoplastic lung disease;
* Identifies the causes, physiology, evaluation and management of hemoptysis.

*Clinical Skills:* During the training program the resident:

* Diagnoses and treats patients with bacterial, fungal, tuberculosis, and viral lung infections;
* Manages patients with chronic obstructive lung disease, bronchospastic airway disease, foreign bodies of the airways, and hemoptysis;
* Takes part in thoracentesis, mediastinoscopy, mediastinotomy, flexible and rigid bronchoscopy, thoracoscopy, and open lung biopsy;
* Implements operative and non-operative management of lung abscess;
* Implements resections of lung and bronchi in patients with non-neoplastic lung disease;
* Does bronchoalveolar lavage and transbronchial lung biopsy.

**Neoplastic Lung Disease**

*Learner Objectives:* Upon completion of this unit the resident:

* Discusses TNM staging of lung carcinoma and its application to the diagnosis, therapeutic planning, and management of patients with lung carcinoma
* Evaluates and diagnoses neoplasia of the lung, using a knowledge of the histologic appearance of the major types;
* Recognizes the signs of inoperability;
* Describes the complications of pulmonary resection and their management;
* Describes the indications for resection of benign lung neoplasms;
* Identifies the indications for resection of pulmonary metastases.
* Identifies the therapeutic options for patients with lung neoplasms;
* Recognizes the role of adjuvant therapy for lung neoplasms.

*Clinical Skills:* During the training program the resident:

* Evaluates patients with lung neoplasia and recommends therapy based on their functional status, pulmonary function and tumor type;
* Demonstrates skills in staging procedures (e.g., bronchoscopy, mediastinoscopy, mediastinotomy, and thoracoscopy);
* Executes operations to extirpate neoplasms of the lung (e.g., local excision, wedge resection, lobectomy);
* Demonstrates skill in bedside bronchoscopies and placement of tracheostomies and/or minitracheostomies;
* Recognizes and treats the early signs of non-cardiac pulmonary edema.
* Does operations to extirpate neoplasms of the lung (e.g., segmental resection, pneumonectomy, sleeve lobectomy, carinal resection, chest wall resection);
* Recognizes and manages complications of pulmonary resections (e.g., space problem, persistent air leak, bronchopleural fistula, bronchovascular fistula,

empyema, cardiac arrhythmia).

**Diseases of the Pleura**

*Learner Objectives:* Upon completion of this unit the resident:

* Describes the clinical presentation of benign and malignant diseases of the pleura;
* Identifies the types of pleural effusions, their evaluation and treatment;
* Describes the indications, contraindications, and complications of video assisted thoracic surgery and has a working knowledge of the equipment;
* Discussses the management of empyema with and without bronchopleural fistula.

*Clinical Skills:* During the training program the resident:

* Evaluates pleural effusions and recommends appropriate therapy;
* Takes part in invasive diagnostic studies (e.g., incisional and excisional biopsy, needle biopsy, fluid analysis);
* Places tube thoracostomies and performs chemical or mechanical pleurodesis;
* Executes video assisted thoracoscopic surgery as necessary for the diagnosis and treatment of pleural disease;
* Applies pleuroperitoneal shunts;
* Executes initial drainage procedures and subsequent procedures for empyema (e.g., decortication, empyemectomy, rib resection, Eloesser flap, Claggett procedure, closure of bronchopleural fistula).

**TRACHEA AND BRONCHI**

**Anatomy and Physiology**

*Learner Objectives:* Upon completion of this unit the resident:

* Describes the anatomy and blood supply of the trachea and bronchi;
* Describes the endoscopic anatomy of the nasopharynx, hypopharynx, larynx, trachea, and major bronchi;
* Describes and interprets pulmonary function studies of the trachea and bronchi;
* Discusses the radiologic assessment of the trachea and bronchi.

*Clinical Skills:* During the training program the resident:

* Interprets plain radiographic analyses, CT scan, MRI, and pulmonary function studies involving the trachea and bronchi;
* Demonstrates ability to perform endoscopy of the upper airway, trachea and major bronchi.

**Acquired and Congenital Abnormalities**

*Unit Goals:* At the end of this unit the resident comprehends congenital and acquired diseases of the trachea and adjacent structures, describes the physiology of tracheal abnormalities, and carries out operative and non-operative management.

*Learner Objectives:* Upon completion of this unit the resident:

* Discusses congenital abnormalities and idiopathic diseases of the trachea;
* Describes the etiology, presentation and management of acquired tracheal strictures and their prevention;
* Describes the radiologic evaluation of tracheal abnormalities.
* Identifies the methods of airway management, anesthesia and ventilation for tracheal operations;
* Describes the etiology, presentation, and principles of airway trauma management;

*Clinical Skills:* During the training program the resident:

* Evaluates diagnostic tests of the trachea and bronchi;
* Performs laryngoscopy and bronchoscopy of the trachea and bronchi, including dilation of stenoses;
* Executes tracheostomy
* Evaluates patients for tracheal resection and plans the operation;

**Neoplasms**

*Learner Objectives:* Upon completion of this unit the resident:

* Identifies the types, histology, and clinical presentation of tracheal neoplasms;
* Describes the indications for and the use of radiotherapy and chemotherapy.

*Clinical Skills:* During the training program the resident:

* Evaluates rigid and flexible bronchoscopy for diagnosis and “core-out”;
* Uses laser techniques in the management of endoluminal tumors;
* Uses stents, tracheal T-tubes and tracheostomy tubes in the management of tracheal neoplasms;
* Uses adjunctive therapy for the management of tracheal tumors.

**MEDIASTINUM AND PERICARDIUM**

**Anatomy and Physiology**

*Learner Objectives:* Upon completion of this unit the resident:

* Describes the anatomic boundaries of the mediastinum and the structures found within each region;
* Discusss the embryologic development of structures within the mediastinum and the variations and pathologic consequences of abnormally located structures;
* Discusses the radiologic assessment of the mediastinum including CT scan, MRI, contrast studies, and angiography;
* Can identify the aberrations caused by pericardial abnormalities and their effects on the heart and circulation.

*Clinical Skills:* During the training program the resident:

* Reads and interprets mediastinal plain radiographs, CT scans, MRI, and contrast studies;
* Applies knowledge of mediastinal anatomy and physiology to the diagnosis of mediastinal abnormalities;
* Applies knowledge of pericardial physiology to the diagnosis of pericardial abnormalities.

**Acquired Abnormalities of the Mediastinum**

*Clinical Skills:* During the training program the resident

* Demonstrates the ability to perform diagnostic tests and operations on the mediastinum;
* Recognizes the histologic appearance of mediastinal tumors;
* Diagnoses and manages mediastinal infection.

**Acquired and Congenital Abnormalities of the Pericardium**

*Learner Objectives:* Upon completion of this unit the resident:

* Discusses the physiologic consequences of increased pericardial fluid and the techniques for diagnosis and management;
* Discusses the operative management of benign and malignant pericardial neoplasms;
* Describes the physiologic consequences of pericardial constriction and the techniques for diagnosis and management.

*Clinical Skills:* During the training program the resident:

* Uses an understanding of abnormal physiologic findings to diagnose pericardial pathology;
* Evaluates diagnostic tests and therapeutic interventions for the treatment of pericardial tamponade, pericardial effusions, and constrictive pericardial disease.
* Evaluates and manages patients with pericardial cysts or tumors.

**DIAPHRAGM**

**Anatomy, Physiology and Embryology**

*Learner Objectives:* Upon completion of this unit the resident:

* Identifies the embryologic origin of the diaphragm;
* Discusses the anatomy of the diaphragm and adjacent structures;
* Describes the neural and vascular supply of the diaphragm and the pathologic consequences of injury;
* Evaluates imaging studies for assessing the diaphragm;
* Describes the consequences of incisions in the diaphragm;
* Identifies developmental anomalies of the diaphragm.

*Clinical Skills:* During the training program the resident:

* Uses knowledge of the normal anatomy and physiology of the diaphragm to treat primary or contiguous abnormalities;
* Evaluates and interprets radiographic studies of the diaphragm, including fluoroscopy, CT scan, and MRI.

**Acquired Abnormalities, Neoplasms**

*Learner Objectives:* Upon completion of this unit the resident:

* Identifies evaluation methods for penetrating injuries of the diaphragm;
* Describes the etiology, diagnosis, and treatment of diaphragmatic paralysis;
* Discusses the presentation of diaphragmatic rupture and associated injuries;
* Distinguishes management of infections immediately above and below the diaphragm;
* Evaluates the etiology, presentation, diagnosis, and management of acquired diaphragmatic hernias;
* Describes the primary and secondary tumors of the diaphragm and their management.

*Clinical Skills:* During the training program the resident:

* Interprets plain and contrast x-rays, fluoroscopy, CT scans, and MRI of the diaphragm;
* Evaluates diagnostic studies of the diaphragm (e.g., pneumoperitoneum, direct incisional and excisional biopsy, video assisted thoracoscopic surgery);
* Performs operative repair of acquired diaphragmatic abnormalities and provides preoperative and postoperative care;
* Reconstructs defects of the diaphragm.

**ESOPHAGUS**

**Anatomy, Physiology and Embryology**

*Learner Objectives:* Upon completion of this unit the resident:

* Discusses the anatomy, embryology, innervation, and vascular supply of the esophagus and adjacent structures;
* Evaluates the physiologic function of the esophagus and pharynx;
* Discusses the radiographic evaluation of the esophagus.

*Clinical Skills:* During the training program the resident:

* Interprets esophageal plain radiographs, contrast studies, CT scans, MRI, and intraluminal echos;
* Orders and interprets manometric and pH studies of the esophagus;
* Performs rigid and flexible endoscopy of the pharynx and esophagus.

**Acquired Abnormalities**

*Learner Objectives:* Upon completion of this unit the resident:

* Discusses the pathophysiology, histology, complications, and diagnosis of esophageal reflux;
* Describes the indications for and principles of anti-reflux operations;
* Discusses the clinical presentation, diagnosis, and management of paraesophageal hernias;
* Identifies the clinical presentation, causes, diagnosis, and treatment of motility disorders of the esophagus;
* Describes the clinical presentation, diagnosis, and management of esophageal perforation;
* Describes the clinical presentation, diagnosis, and management of chemical injuries and trauma of the esophagus;
* Explains the indications, methods, and operative approaches for esophageal replacement;
* Explains the clinical presentation, diagnosis, and management of esophageal foreign bodies;
* Reviews the etiology, presentation, and management of infections after esophageal injuries and operations.

*Clinical Skills:* During the training program the resident:

* Interprets esophageal plain radiographs, contrast studies, CT scans, MRI, manometry, pH studies, and intraluminal echo;
* Carries out esophagoscopy, foreign body removal and biopsy;
* Uses various operative approaches to different parts of the esophagus;
* Demonstrates knowledge in the ability to perform anti-reflux operations including management of strictures;
* Demonstrates knowledge in the ability to perform resection and reconstruction using various esophageal substitutes;
* Evaluates and manages patients with esophageal motility disorders, performs myotomy and resection of diverticula;
* Manages the complications of esophageal operations;
* Uses video assisted thoracic surgery for esophageal diseases where appropriate.
* Diagnoses, manages, and performs operations for esophageal perforation, chemical burns, and trauma

**Neoplasms**

*Learner Objectives:* Upon completion of this unit the resident:

* Describes the types of benign esophageal neoplasms, their clinical presentation, diagnosis, and treatment;
* Describes the types of malignant esophageal neoplasms, their clinical presentation, diagnosis, histologic appearance, and treatment;
* Recognizes the TNM staging of esophageal cancer;
* Describes the principles of patient management after esophageal resection;
* Discusses the nutritional management of patients with esophageal neoplasms.
* Discusses the role of chemotherapy and radiotherapy in esophageal cancer;
* Identifies the operative approaches, methods, and complications of esophageal resection and reconstruction;
* Evaluates the indications for operative and non-operative treatment of esophageal cancer.

*Clinical Skills:* During the training program the resident:

* Evaluates malignant and benign esophageal tumors and recommends overall management, including neoadjuvant therapy;
* Does diagnostic tests for esophageal neoplasms and correlates the results with clinical staging;
* Performs esophagectomy through various approaches;
* Carries out reconstruction with various esophageal substitutes;
* Diagnoses and manages complications of esophageal surgery;
* Manages nutritional needs after esophageal surgery;
* Diagnoses palliative operations for obstructing esophageal lesions;
* Recommends appropriate postoperative or alternate therapy for advanced or recurrent disease.

**THORACIC TRAUMA**

**Trauma of the Chest Wall**

*Learner Objectives:* Upon completion of this unit the resident:

* Evaluate patients with blunt or penetrating chest wall injury
* Assesses the physiology and mechanics of operative drainage of the thoracic cavity;
* Evaluates the operative and non-operative management of chest wall injuries;
* Discusses the pathophysiology of flail chest.

*Clinical Skills:* During the training program the resident:

* Evaluates and treats chest wall injuries;
* Completes emergency operations to repair chest wall injuries and provides postoperative management.

**Tracheobronchial and Pulmonary Trauma**

*Learner Objectives:* Upon completion of this unit the resident:

* Discusses clinical presentation and radiologic findings of tracheobronchial injury;
* Demonstrates the principles of airway management;
* Identifies the bronchoscopic findings of tracheobronchial and pulmonary injury;
* Evaluates injuries associated with tracheobronchial and pulmonary injury.

*Clinical Skills:* During the training program the resident:

* Evaluates and manages patients with tracheobronchial trauma;
* Manages the airway of patients with tracheobronchial injuries;
* Structures non-operative management of pulmonary contusion;
* Carries out emergency operations to repair peripheral pulmonary and hilar injuries;
* Uses precautions to avoid air embolism in patients with penetrating and blunt injuries.

**Esophageal Trauma**

*Learner Objectives:* Upon completion of this unit the resident:

* Understands the etiology and presentation of esophageal trauma;
* Understands the methods of assessment and diagnosis of esophageal trauma;
* Understands the management of injuries that disrupt the esophagus;
* Understands the management of complications of esophageal injury treatment.

*Clinical Skills:* During the training program the resident:

* Evaluates and interprets diagnostic tests of patients with esophageal trauma;
* Performs the operative treatment of patients with esophageal injuries;
* Manages the complications of operations for esophageal injury.

**Diaphragmatic Trauma**

*Learner Objectives:* Upon completion of this unit the resident:

* Describes the presentation, evaluation, and treatment of blunt and penetrating diaphragmatic injuries;
* Discusses the evaluation and management of associated injuries;
* Comprehends the presentation of delayed diaphragmatic injury, its diagnosis and management.

*Clinical Skills:* During the training program the resident:

* Applies emergency evaluation and diagnosis of diaphragmatic and associated injuries;
* Completes operative repair of acute and chronic diaphragmatic and associated injuries;
* Evaluates the presentation of delayed diaphragmatic injury, its diagnosis and management.

**Cardiovascular Trauma**

*Clinical Skills:* During the training program the resident:

* Participates in emergency operations to repair penetrating injuries of the heart and thoracic great vessels, and provides postoperative management.

**TRANSPLANTATION**

**Lung Transplantation**

*Learner Objectives:* Upon completion of the unit the resident:

* Discusses the evaluation and management of organ donors;
* Recognizes the signs and symptoms of lung rejection or infection and knows the appropriate management;
* Recognizes the methods for harvesting and preserving donor lungs;
* Describes the indications for lung transplantation;
* Dsecribes the management of immunosuppressive therapy in lung transplantation;
* Is familiar with the techniques and complications of bronchoscopy of the transplanted lung.

*Clinical Skills:* During the training program the resident:

* Evaluates donor evaluation and management;
* Manages donor lung harvest and preservation;
* Manages the lung transplant recipient preoperatively and postoperatively;
* Evaluates transplant recipients for signs of rejection or infection, and initiates appropriate therapy;
* Participates in lung transplantation;
* Participates in the immunosuppressive therapy for lung transplantation;
* Carries out transbronchial biopsy.

**MINOR PROCEDURES**

**Thoracentesis**

*Learner Objectives*: Upon completion of this unit the resident

* Describes the indications and the contra-indications for thoracentesis.
* Identifies techniques and complications for thoracentesis and their management.

*Clinical Skills*: During the training program the resident

* Evaluates the patient for thoracentesis.
* Manages thoracentesis under local anesthesia.
* Manages the complications of thoracentesis.

**Mini Tracheostomy**

*Minor Objectives*: Upon completion of this unit the resident

* Evaluates the indications and the contra-indications for mini tracheostomy.
* Describes techniques and complications for mini tracheostomy and their management.

*Clinical Skills*: During the training program the resident

* Evaluates the patient for mini tracheostomy.
* Manages mini tracheostomy under local/general anesthesia.
* Manages the complications of mini tracheostomy.

**Intra-Aortic Balloon Pump Insertion**

*Minor Objectives*: Upon completion of this unit the resident

* Recognizes the indications and the contra-indications, management and complications of Intra-aortic balloon pump insertion.

*Clinical Skills*: During the training program the resident

* Evaluates the patient for intra-aortic balloon pump insertion.
* Manages intra-aortic balloon pump insertion using the appropriate techniques.
* Manages the complications of intra-aortic balloon pump insertion.

**Bronchoscopy**

*Learner Objectives:* Upon completion of this unit the resident:

* Identifies indications, techniques, and complications of rigid and fiberoptic bronchoscopy of the larynx and tracheobronchial tree.

*Clinical Skills:* During the training program the resident:

* Evaluates and manages patients requiring bronchoscopy;
* Manages rigid and fiberoptic bronchoscopy using various anesthetic techniques;
* Acquires diagnostic material using various biopsy techniques;
* Uses laser techniques via bronchoscopy;
* Uses stents via bronchoscopy.

**Esophagoscopy**

*Learner Objectives:* Upon completion of this unit the resident:

* Recognizes indications, techniques, and complications of rigid and fiberoptic esophagoscopy.

*Clinical Skills:* During the training program the resident:

* Evaluates and manages patients requiring esophagoscopy;
* Manages rigid and fiberoptic esophagoscopy using various anesthetic techniques;
* Uses laser techniques via esophagoscopy;
* Uses stents via esophagoscopy.

**Tube Thoracostomy**

*Learner Objectives:* Upon completion of this unit the resident:

* Recognizes the indications and contraindications for tube thoracostomy;
* Reviews the techniques and complications of tube thoracostomy and their management.

*Clinical Skills:* During the training program the resident:

* Evaluates patients for tube thoracostomy;
* Manages tube thoracostomy under local, regional and general anesthesia;
* Treats the complications of tube thoracostomy.

**Central Venous Lines and Arterial Lines**

*Learner Objectives:* Upon completion of this unit the resident:

* Describes the indications, contraindications, management and complications of central venous lines and arterial lines.

*Clinical Skills:* During the training program the resident:

* Manages central venous line insertions by appropriate techniques (e.g., internal jugular vein, subclavian vein, femoral vein);
* Manages arterial line insertions by appropriate techniques (e.g., radial, brachial, femoral and pedal arteries);
* Manages complications of central venous and arterial lines.

**IV.A.5.c) Practice-based Learning and Improvement**

**Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning. Residents are expected to develop skills and habits to be able to meet the following goals:**

**IV.A.5.c).(1) identify strengths, deficiencies, and limits in one’s knowledge and expertise;**

The resident is expected to:

* Work with faculty and the program director to identify deficiencies and knowledge using the inservice training exam, and TSDA curriculum quizzes, clinical conferences, and daily clinical practice

**IV.A.5.c).(2) set learning and improvement goals;**

The resident is expected to:

* Work with faculty to improve comprehension or performance as measured by inservice, and TSDA weekly exams, and to seek regular feedback on technical and clinical skills

**IV.A.5.c).(3) identify and perform appropriate learning activities;**

The resident is expected to:

* Complete weekly TSDA reading/viewing assignments, and read such extra sources as may be assigned for clinical conferences or to address deficiencies.
* Avail themselves of opportunities to work on technical skills in animal labs

**IV.A.5.c).(4) systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement;**

The resident is expected to:

* Attend and review results of Quality Improvement conferences
* Bring observations for possible quality improvement projects to the attention of faculty

**IV.A.5.c).(5) incorporate formative evaluation feedback into daily practice;**

The resident is expected to:

* Periodically review results of 360 degree evaluations with the Program Director

**IV.A.5.c).(6) locate, appraise, and assimilate evidence from scientific studies related to their patients’ health problems;**

The resident is expected to:

* Discuss alternative treatment strategies with an attending prior to a procedure, supporting decision making with relevant literature
* Be prepared to exercise this skill in Clinical Decision Making and Mortality and Morbidity Conferences.
* Read published material and listen to presentations critically;
* Demonstrate understanding of the essential steps of the research process by preparing and submitting a manuscript for publication in a peer-reviewed journal or gives a presentation at Grand Rounds which meets the satisfaction of his/her teachers. Either an oral or a written presentation is appropriate.
* •Demonstrate competence by:
  + Defining an analyzable problem or scientific question
  + Assembling an appropriate literature review
  + Synthesizing and analyzing available data
  + Formulating an informed and insightful discussion
  + Composing a properly constructed, critically reviewed bibliography or list of literature citations
* Show an understanding of the appropriate application of statistical tests to the problem;
* Demonstrate an understanding of the appropriate application of other commonly used statistical tests such as univariate analysis, multivariate analysis, analysis of variance, and the use of T-tests for paired data and multiple comparisons. (Residents should know the limitations, deficiencies and proper applications of these commonly used statistical tests);
  + •Show evidence of ability to critically analyze major clinical research papers in the thoracic literature which guide practice;
* •Apply knowledge of the scientific method to design and execute at least one formal analysis to solve a problem related to thoracic surgery.

**IV.A.5.c).(7) use information technology to optimize learning;**

The resident is expected to:

* Demonstrate a facility to conduct electronic literature searches, and to distribute electronic format papers to team members for clinical purposes and for such conferences as Journal Club.

**IV.A.5.c).(8) participate in the education of patients, families, students, residents and other health professionals.**

The resident is expected to:

* Explain the risks and benefits of procedures to patients and family, and obtain informed consent under direct faculty observation, then seek immediate feedback on performance.

**IV.A.5.c).(9) demonstrate the ability to practice lifelong learning, analyze personal practice outcomes, and use information technology to optimize patient care.**

**IV.A.5.d) Interpersonal and Communication Skills**

**Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.**

**IV.A.5.d).(1) communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;**

The resident is expected to:

* Explain the risks and benefits of procedures to patients and family, and obtain informed consent under direct faculty observation, then seek immediate feedback on performance.

**IV.A.5.d).(2) communicate effectively with physicians, other health professionals, and health related agencies;**

The resident is expected to:

* Lead Multi-discplinary ICU rounds each morning under direct faculty supervision.
* Receive and execute effective sign out of responsibility with each change of shift
* Receive and execute effective sign out with the floor team in order to round with the attending on weekends

**IV.A.5.d).(3) work effectively as a member or leader of a health care team or other professional group;**

The resident is expected to:

* Lead the conduct of a case, co-ordinating with nursing, anesthesia, and perfusion staff under direct faculty observation
* Lead the conduct of resuscitation and other emergency care under direct faculty supervision

**IV.A.5.d).(4) act in a consultative role to other physicians and health professionals; and,**

The resident is expected to:

* Conduct history and physicals, review laboratory and imaging studies promptly, and synthesize this data into a differential diagnosis, and treatment plan with a faculty member in a prompt and effective fashion.
* Determine specific questions and objectives for which the consult has been requested.

**IV.A.5.d).(5) maintain comprehensive, timely, and legible medical records, if applicable.**

The resident is expected to:

* Gain facility in the use of the EPIC EMR systems
* Forward all documentation for review and co-signature of the attending using the EPIC EMR system.

**IV.A.5.e) Professionalism**

**Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. Residents are expected to demonstrate:**

**IV.A.5.e).(1) compassion, integrity, and respect for others;**

**IV.A.5.e).(2) responsiveness to patient needs that supersedes self-interest;**

**IV.A.5.e).(3) respect for patient privacy and autonomy;**

**IV.A.5.e).(4) accountability to patients, society and the profession; and,**

**IV.A.5.e).(5) sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.**

**IV.A.5.e).(6) high standards of ethical behavior; demonstrate continuity of care (pre-operative, operative, and post-operative); demonstrate sensitivity to age, gender, culture, and other differences; and demonstrate honesty, dependability, and commitment.**

**IV.A.5.f) Systems-based Practice**

**Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. Residents are expected to:**

**IV.A.5.f).(1) work effectively in various health care delivery settings and systems relevant to their clinical specialty;**

**IV.A.5.f).(2) coordinate patient care within the health care system relevant to their clinical specialty;**

**IV.A.5.f).(3) incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate;**

**IV.A.5.f).(4) advocate for quality patient care and optimal patient care systems;**

**IV.A.5.f).(5) work in interprofessional teams to enhance patient safety and improve patient care quality; and,**

**IV.A.5.f).(6) participate in identifying system errors and implementing potential systems solutions.**

The resident is expected to:

* Regularly attend the monthly QI multidisciplinary conference
* Identify a QI issue, research its background, design a solution and implement it by conclusion of the residency, collaborating with other residents, associated and ancillary services.

**IV.A.5.f).(7) practice cost-effective care without compromising quality, promote disease prevention, demonstrate risk-benefit analysis, and know how different practice systems operate to deliver care.**

The Resident is expected to:

•Understand organizational structure and mechanics of solo practice, group specialty practice, multi-specialty practice, and academic practice;

•Know the structure, responsibilities and requirements of managed care, capitation payment, contractual agreements, physician-hospital organizations, and independent Practice agreements.