Provided below are the specific educational goals for the residents as it pertains to their acquisition of knowledge in Thoracic Surgery. Each listing represents a section of the Comprehensive Requisite Thoracic Surgery Curriculum.

GENERAL THORACIC SURGERY ROTATION YEAR 2

I. CHEST WALL

A. Anatomy, Physiology and Embryology

Learner Objectives: Upon completion of this unit the resident:

- Understands the anatomy of the vascular, neural, muscular, and bony components of the thoracic outlet;
- Knows 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:

- Reads and interprets tests to diagnose chest wall abnormalities.

B. Acquired Abnormalities and Neoplasms

Learner Objectives: Upon completion of this unit the resident:

- Understands the diagnosis and management of various chest wall infections;
- Knows 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:

- Performs surgical resections of primary and secondary chest wall tumors;
- Identifies the need for major flaps of the chest wall.

C. Congenital Abnormalities and Thoracic Outlet Syndrome

Learner Objectives: Upon completion of this unit the resident:

- Understands the etiology, evaluation, differential diagnosis, and diagnostic criteria for thoracic outlet syndrome;
- Knows the operative and non-operative management of thoracic outlet syndrome.
Clinical Skills: During the training program the resident:

- Evaluates and treats patients with congenital chest wall malformations;
- Performs the operative reconstruction of selected chest wall defects;
- Performs first rib and cervical rib resection and repairs or releases vascular and neural abnormalities associated with thoracic outlet syndrome.

GENERAL THORACIC SURGERY ROTATION YEAR 2

II. LUNGS AND PLEURA

A. Anatomy, Physiology, Embryology and Testing

Learner Objectives: Upon completion of this unit the resident:

- Understands the segmental anatomy of the bronchial tree and bronchopulmonary segments;
- Knows how to perform pulmonary function tests.

Clinical Skills: During the training program the resident:

- Applies knowledge of thoracic anatomy to flexible and rigid endoscopy;
- Participates in the performance of exercise tolerance tests and pulmonary function tests.

B. Non-Neoplastic Lung Disease

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

- Knows the indications for bullectomy, lung reduction, and pulmonary transplantation;
- Understands the principles of surgical resection for non-neoplastic lung disease;
- Understands the causes, physiology, evaluation and management of hemoptysis.

Clinical Skills: During the training program the resident:

- Performs operative and non-operative management of lung abscess;
- Performs resections of lung and bronchi in patients with non-neoplastic lung disease;
- Performs bronchoalveolar lavage and transbronchial lung biopsy.

C. Neoplastic Lung Disease

Learner Objectives: Upon completion of this unit the resident:

- Understands the therapeutic options for patients with lung neoplasms;
- Understands the role of adjuvant therapy for lung neoplasms.
Clinical Skills: During the training program the resident:

- Performs 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).

D. Congenital Lung Disease

Learner Objectives: Upon completion of this unit the resident:

- Recognizes various congenital lung abnormalities and understands their anatomy and indications for treatment.

Clinical Skills: During the training program the resident:

- Evaluates patients with congenital lung abnormalities;
- Performs operations for congenital lung abnormalities and their complications.

E. Diseases of the Pleura

Learner Objectives: Upon completion of this unit the resident:

- Understands the management of empyema with and without bronchopleural fistula.

Clinical Skills: During the training program the resident:

- Performs initial drainage procedures and subsequent procedures for empyema (e.g., decortication, empyemectomy, rib resection, Eloesser flap, Claggett procedure, closure of bronchopleural fistula).

GENERAL THORACIC SURGERY ROTATION YEAR 2

III. TRACHEA AND BRONCHI

A. Congenital and Acquired Abnormalities

Unit Objective: At the end of this unit the resident understands congenital and acquired diseases of the trachea and adjacent structures, knows the physiology of tracheal abnormalities, and performs operative and non-operative management.

Learner Objectives: Upon completion of this unit the resident:

- Knows the methods of airway management, anesthesia and ventilation for tracheal operations;
- Understands the etiology, presentation, and principles of airway trauma management.
Clinical Skills: During the training program the resident:

- Evaluates patients for tracheal resection and plans the operation.

B. Neoplasms

Learner Objectives: Upon completion of this unit the resident:

- Knows the types, histology, and clinical presentation of tracheal neoplasms;
- Knows the indications for and the use of radiotherapy and chemotherapy.

Clinical Skills: During the training program the resident:

- Performs 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.

GENERAL THORACIC SURGERY ROTATION YEAR 2

IV. MEDIASTINUM AND PERICARDIUM

A. Anatomy, Physiology and Embryology

Clinical Skills: During the training program the resident:

- Applies knowledge of mediastinal anatomy and physiology to the diagnosis of mediastinal abnormalities;
- Applies knowledge of pericardial physiology to the diagnosis of pericardial abnormalities.

B. Congenital Abnormalities of the Mediastinum

Learner Objectives: Upon completion of this unit the resident:

- Is familiar with the symptoms associated with mediastinal abnormalities.

Clinical Skills: During the training program, the resident:

- Diagnoses and manages patients with congenital abnormalities of the mediastinum.

C. Acquired Abnormalities of the Mediastinum

Clinical Skills: During the training program the resident

- Diagnoses and manages mediastinal infection.
D. Congenital and Acquired Abnormalities of the Pericardium

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

- Understands the operative management of benign and malignant pericardial neoplasms;
- Understands the physiologic consequences of pericardial constriction and the techniques for diagnosis and management.

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

- Evaluates and manages patients with pericardial cysts or tumors.

GENERAL THORACIC SURGERY ROTATION YEAR 2

V. DIAPHRAGM

A. Anatomy, Physiology and Embryology

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

- Understands the consequences of incisions in the diaphragm;
- Understands developmental anomalies of the diaphragm.

B. Acquired Abnormalities, Neoplasms

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

- Understands the presentation of diaphragmatic rupture and associated injuries;
- Knows management of infections immediately above and below the diaphragm;
- Understands the etiology, presentation, diagnosis, and management of acquired diaphragmatic hernias;
- Understands the primary and secondary tumors of the diaphragm and their management.

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

- Performs operative repair of acquired diaphragmatic abnormalities and provides preoperative and postoperative care;
- Reconstructs defects of the diaphragm.

C. Congenital Abnormalities

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

- Diagnoses and manages infants and adults with diaphragmatic hernias.
VI. ESOPHAGUS

A. Congenital Abnormalities

Learner Objectives: Upon completion of this unit the resident:

- Understands the clinical presentations, types, diagnosis and treatment of esophageal atresia and congenital tracheo-esophageal fistula;
- Understands the clinical presentation and diagnosis of esophageal duplication cysts.

Clinical Skills: During the training program the resident:

- Evaluates patients with various types of esophageal atresia/tracheoesophageal fistula and recommends management;
- Performs diagnostic tests of congenital esophageal diseases;
- Performs or participates in the operative repair of tracheo-esophageal fistula;
- Performs the operative management of esophageal duplication cysts.

B. Acquired Abnormalities

Learner Objectives: Upon completion of this unit the resident:

- Understands the indications, methods, and operative approaches for esophageal replacement;
- Understands the clinical presentation, diagnosis, and management of esophageal foreign bodies;
- Understands the etiology, presentation, and management of infections after esophageal injuries and operations.

Clinical Skills: During the training program the resident:

- Diagnoses, manages, and performs operations for esophageal perforation, chemical burns, and trauma.

C. Neoplasms

Learner Objectives: Upon completion of this unit the resident:

- Understands the role of chemotherapy and radiotherapy in esophageal cancer;
- Understands the operative approaches, methods, and complications of esophageal resection and reconstruction;
- Understands the indications for operative and non-operative treatment of esophageal cancer.
Clinical Skills: During the training program the resident:

- Recommends appropriate postoperative or alternate therapy for advanced or recurrent disease.

PEDIATRIC CARDIAC SURGERY ROTATION YEAR 2 (3 MONTHS)

VII. CONGENITAL HEART DISEASE

A. Embryology, Anatomy and History

Learner Objectives: Upon completion of the unit the resident:

- Knows the embryology and anatomy of the normal heart;
- Knows the history of congenital cardiac surgery, and the intellectual development of operations used to manage each cardiac anomaly;
- Knows the embryology and anatomy of major cardiac anomalies;
- Interprets angiocardiograms, echocardiograms, and other images and correlates these with normal and abnormal cardiac anatomy.

Clinical Skills: During the training program the resident:

- Applies knowledge of the normal and abnormal anatomy of the heart to the planning and performance of operations;
- Interprets angiocardiograms, echocardiograms, and other images to diagnose congenital heart disease;
- Uses knowledge to select the best procedure for individual patients.

B. Physiology and Physiologic Evaluation

Learner Objectives: Upon completion of the unit the resident:

- Understands normal fetal circulation;
- Understands the transitional nature of circulation as the fetus becomes a neonate;
- Understands the physiology of obstructions, of intra- and extracardiac shunts, of abnormal connections to the heart, and of combinations of these anomalies in the fetus, neonate, and child.

Clinical Skills: During the training program the resident:

- Describes the physiologic changes of circulation during neonatal life;
- Diagnoses clinically important congenital heart diseases in the neonate, infant, and child;
- Applies a knowledge of anatomic abnormalities and their physiologic consequences to diagnose congenital heart defects;
• Performs calculations of blood flows and resistances from cardiac catheterization data;
• Manages the physiologic aspects of the neonate, infant, and child with congenital heart disease preoperatively, intraoperatively, and postoperatively;
• Stabilizes patients who are critically ill with congenital heart disease.

C. Cardiopulmonary Bypass for Operations on Congenital Cardiac Anomalies

Learner Objectives: Upon completion of the unit the resident:

• Knows arterial and venous cannulation techniques for different intracardiac defects;
• Knows the indications for the various techniques of bypass (anatomy, pathophysiology, and technical requirements of the underlying cardiac defects);
• Understands the techniques of myocardial protection in the neonate and young infant;
• Understands the use of varying levels of hemodilution and anticoagulation;
• Understands perfusion flow and pressure control;
• Knows the methods of body temperature manipulation, and the indications for and techniques of profound hypothermia with and without total circulatory arrest.

Clinical Skills: During the training program the resident:

• Performs arterial and venous cannulation and initiates cardiopulmonary bypass;
• Directs the perfusionist in the intraoperative management and conduct of cardiopulmonary bypass;
• Performs or participates in the repair of congenital heart defects using cardiopulmonary bypass.

D. Left-To-Right Shunts

Learner Objectives: Upon completion of the unit the resident:

• Knows the anatomy, embryology, and physiology of the most common or important anomalies;
• Knows the operative indications of the most common or important anomalies;
• Knows the technical components of the operative repair of the most common or important anomalies;
• Understands the postoperative care of each anomaly.

Clinical Skills: During the training program the resident:

• Performs the preoperative evaluation of patients with each of these anomalies;
• Participates in or performs the operative repair of ventricular septal defects;
• Participates in or performs the repair of more complex cardiac anomalies;
• Performs the preoperative evaluation of patients with each of these anomalies;
• Manages postoperative care.

E. Cyanotic Anomalies

Learner Objectives: Upon completion of the unit the resident:
• Knows the anatomy and physiology of each anomaly;
• Knows the methods of diagnosis;
• Understands the role of medical management and interventional cardiology as treatment options;
• Knows the indications for and timing of operation;
• Understands the technical components of operative repair;
• Knows the postoperative care, expected outcome, long-term results, and complications.

Clinical Skills: During the training program the resident:
• Performs preoperative evaluation and preparation;
• Participates in or performs operative repair of tetralogy, TGA, Truncus arteriosus, TAPVR, Ebstein's anomaly, and Fontan-type operations;
• Participates in or performs the major palliative operations for these congenital cardiac anomalies;
• Manages postoperative care.

F. Obstructive Anomalies

Unit Objective: At the end of this unit the resident understands the anatomy and physiology of obstructive anomalies of the left and right sides of the heart and aorta, their diagnosis, management, and postoperative care, and performs the operative and non-operative treatment.

Learner Objectives: Upon completion of the unit the resident:
• Knows the anatomy and physiology of each anomaly;
• Knows the methods of diagnosis;
• Understands the role of medical management and interventional cardiology;
• Understands the principles of postoperative care;
• Knows the technical components of operative repair;
• Knows the expected outcome, long-term results and complications.

Clinical Skills: During the training program the resident:
• Performs corrections for patent ductus arteriosus and coarctation of the aorta;
- Performs preoperative evaluation and preparation;
- Manages postoperative care;
- Uses prostaglandins in the management of patients with neonatal coarctation, interrupted aortic arch, critical aortic stenosis;
- Participates in or performs aortic valvotomy, repair of supravalvular and subvalvular aortic stenosis, pulmonary valvotomy, correction of subvalvular pulmonary stenosis, correction of vascular rings;
- Participates in or performs operations for left ventricular outflow obstruction and interrupted aortic arch;

G. Miscellaneous Anomalies

**Learner Objectives:** Upon completion of the unit the resident:
- Understands the natural history, evaluation, and treatment of coronary anomalies, congenital complete heart block, hypoplastic left heart syndrome, pulmonary atresia (with and without VSD), “corrected transposition”, single ventricle, cor triatratium, and cardiac tumors;
- Understands the role of corrective and palliative operations for the above anomalies and of cardiac transplantation for appropriate cardiac pathology.

**Clinical Skills:** During the training program the resident:
- Evaluates angiocardiograms, echocardiograms, and cardiac catheterizations of the above anomalies;
- Performs or assists in pacemaker insertion, systemic-to-pulmonary artery shunting for pulmonary atresia or stenosis (with or without VSD), and pulmonary artery banding for large left-to-right shunts;
- Develops treatment plans for the above anomalies;
- Participates in or performs operative treatment for the above anomalies;
- Manages postoperative care for the above anomalies.

H. Principles of Postoperative Care

**Learner Objectives:** Upon completion of the unit the resident:
- Knows the physiologic characteristics of neonates and small infants;
- Understands the management of infants and children who have undergone operative correction of simple and complex congenital cardiac anomalies;
• Understands the postoperative management of patients with systemic-to-pulmonary artery shunts;
• Understands the management of patients who have had a right heart bypass operation;
• Understands the physiologic preoperative and postoperative management of patients with hypoplastic left heart syndrome;
• Understands which infants and children are prone to have a pulmonary hypertensive crisis;
• Knows the prevention, recognition, and treatment of pulmonary hypertensive crises.

Clinical Skills: During the training program the resident:
• Manages ventilators for infants and children with and without obligatory intracardiac shunts;
• Assesses the cardiac output and pulmonary and systemic resistance in infants and children;
• Uses physiologic and pharmacologic manipulation of preload, myocardial contractility, heart rate, and afterload to optimize cardiac output in critically ill infants and children;
• Evaluates the metabolic reserve of neonates and infants and provides prompt therapeutic intervention as indicated;
• Anticipates problems and complications of postoperative pediatric patients and provides appropriate treatment.

ADULT CARDIAC SURGERY ROTATION YEAR 2

VIII. ACQUIRED HEART DISEASE

A. Coronary Artery Disease

Learner Objectives: Upon completion of the unit the resident:
• Understands the development of atherosclerotic plaques and the current theories of plaque origination;
• Knows the normal and variant anatomy of coronary circulation as well as the radiographic anatomy of the coronary arteries and the left and right ventricles;
• Can describe outcomes of angioplasty and of operative and non-operative treatment of coronary artery disease, using statistical methods.

Clinical Skills: During the training program the resident:
• Performs operative and non-operative management of patients with ischemic heart disease, including coronary artery bypass grafting using the internal mammary artery;
• Directs the critical care management of preoperative and postoperative patients with ischemic heart disease;
• Participates in the performance and evaluation of exercise tolerance tests, echocardiograms, and cardiac catheterizations.

B. Myocarditis, Cardiomyopathy, Hypertrophic Obstructive Cardiomyopathy, Cardiac Tumors

Clinical Skills: During the training program the resident

• Evaluates and interprets chest x-rays, CT scans, MRI, echocardiograms, and cardiac catheterizations of patients with cardiac tumors, myocarditis, cardiomyopathy and hypertrophic cardiomyopathy (HCM);
• Participates in or performs heart transplants and provides preoperative and postoperative care;
• Participates in echocardiography, cardiac catheterization, endomyocardial biopsy, and donor heart harvesting.

C. Abnormalities of the Aorta

Learner Objectives: Upon completion of the unit the resident:

• Understands the etiology and the physiology of aortic dissections and all aneurysms involving the ascending, transverse, descending, and abdominal aorta;
• Knows the operative and nonoperative management of patients with acute and chronic aortic dissections.

Clinical Skills: During the training program the resident:

• Evaluates and interprets plain radiography, echocardiography, CT scans, MRI, and contrast studies for diseases of the aorta;
• Performs preoperative and postoperative care of patients with aneurysms, dissections, and occlusive disease of the aorta.

D. Cardiac Arrhythmias

Learner Objectives: Upon completion of the unit the resident:

• Understands the etiology of cardiac arrhythmias and underlying physiologic disturbances.

Clinical Skills: During the training program the resident:

• Participates in electrophysiologic studies.
E. Valvular Heart Disease

Unit Objective: At the end of this unit, the resident knows the normal and pathologic anatomy of the cardiac valves, understands their natural history, physiology and clinical assessment, and performs operative and non-operative treatment.

Learner Objectives: Upon completion of the unit the resident:

- Understands the operative and non-operative therapeutic options for the treatment of each major valvular lesion;
- Knows the techniques for repair and replacement of cardiac valves.

Clinical Skills: During the training program the resident:

- Evaluates, diagnoses and selects management strategies for patients with valvular heart disease, including participation in and interpretation of cardiac catheterizations and echocardiograms;
- Makes use of the therapeutic options and relative risks of operative and nonoperative treatment for valvular heart disease in planning interventions;
- Manages preoperative clinical preparation and early and intermediate postoperative care;
- Performs valve repair and replacement for valvular disease, interprets intraoperative echo.

GENERAL THORACIC SURGERY ROTATION YEAR 2

IX. THORACIC TRAUMA

A. Tracheobronchial and Pulmonary Trauma

Learner Objectives: Upon completion of this unit the resident:

- Understands the management of tracheobronchial and pulmonary injury.

Clinical Skills: During the training program the resident:

- Repairs tracheobronchial and associated injuries.

B. Esophageal Trauma

Learner Objectives: Upon completion of this unit the resident:

- Understands the management of complications of esophageal injury treatment.

Clinical Skills: During the training program the resident:

- Manages the complications of operations for esophageal injury.
C. Diaphragmatic Trauma

Learner Objectives: Upon completion of this unit the resident:

- Knows the presentation of delayed diaphragmatic injury, its diagnosis and management.

Clinical Skills: During the training program the resident:

- Knows the presentation of delayed diaphragmatic injury, its diagnosis and management.

D. Cardiovascular Trauma

Clinical Skills: During the training program the resident:

- Performs or participates in emergency operations to repair penetrating injuries of the heart and thoracic great vessels, and provides postoperative management.

ADULT CARDIAC SURGERY ROTATION YEAR 2

X. TRANSPLANTATION

A. Cardiac Transplantation

Learner Objectives: Upon completion of the unit the resident:

- Understands the management of immunosuppressive therapy in cardiac transplantation;
- Knows the techniques of cardiac transplantation;
- Is familiar with the techniques and complications of endomyocardial biopsy.

Clinical Skills: During the training program the resident:

- Performs cardiac transplantation;
- Manages the cardiac transplant recipient preoperatively and postoperatively;
- Participates in the immunosuppressive therapy for cardiac transplantation.

GENERAL THORACIC SURGERY ROTATION YEAR 2

B. Lung Transplantation

Learner Objectives: Upon completion of the unit the resident:

- Knows the indications for lung transplantation;
- Understands 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:

- Performs or participates in lung transplantation;
• Participates in the immunosuppressive therapy for lung transplantation;
• Performs transbronchial biopsy.

ADULT CARDIAC SURGERY ROTATION YEAR 2

C. Heart-Lung Transplantation

Learner Objectives: Upon completion of the unit the resident:

• Knows the indications for heart-lung transplantation;
• Understands the management of immunosuppressive therapy of heart-lung transplantation;
• Recognizes the signs and symptoms of pulmonary rejection in cardiopulmonary transplantation;
• Recognizes infection and rejection, and knows the appropriate management of each;
• Is familiar with the techniques and complications of radiologic and fiberoptic bronchoscopy of the transplanted lung in the heart-lung recipient.

Clinical Skills: During the training program the resident:

• Participates in immunosuppressive therapy for transplantation;
• Evaluates transplant recipients for signs of pulmonary rejection and infection, and of cardiac dysfunction.

ADULT CARDIAC SURGERY ROTATION YEAR 2

XI. EXTRACORPOREAL BYPASS AND COAGULATION - BLOOD PRODUCTS

A. Physiology of Extracorporeal Bypass

Learner Objectives: Upon completion of the unit the resident:

• Understands the basic design and function of ventricular support devices.

Clinical Skills: During the training program the resident:

• Plans and uses ventricular support devices in clinical practice.

B. Techniques of Extracorporeal Bypass

Learner Objectives: Upon completion of the unit the resident:

• Understands the techniques for left heart bypass and right heart bypass for the treatment of specific clinical problems.

Clinical Skills: During the training program the resident:

• Uses appropriate types of extracorporeal bypass to solve specific clinical problems.
C. Mechanical Support

Learner Objectives: Upon completion of the unit the resident:

- Knows the techniques for inserting these ventricular support devices;
- Recognizes complications of the devices;
- Understands the use of mechanical devices as a “bridge” to transplantation;
- Knows the requirements for anticoagulation and monitoring of blood trauma.

ADULT CARDIAC SURGERY ROTATION YEAR 2

XII. MINOR PROCEDURES

A. Permanent Pacemakers

Learner Objectives: Upon completion of this unit the resident:

- Understands the indications and contraindications for permanent cardiac pacing;
- Knows the techniques and complications of epicardial and transvenous cardiac pacemakers.

Clinical Skills: During the training program the resident:

- Manages complications of pacemakers (e.g., infections, programming problems, lead fractures).

MISCELLANEOUS

XIII. THORACIC SURGERY AND RESEARCH

Learner Objectives: Upon completion of this unit the resident:

- Understands the scientific method as it applies to basic and clinical research;
- Knows how to access the literature including computerized and conventional library searches;
- Is able to interpret published material critically;
- Understands the role of statistics in validating scientific inferences, including the appropriate application of statistical tests commonly used in the thoracic literature, their limitations and deficiencies;
- Understands the role of power, significance, and sample size in interpreting data;
- Knows how to develop and design a research proposal and complete the process of solving a problem scientifically.
XIV. NON-CLINICAL ELEMENTS OF THORACIC SURGICAL PRACTICE

Learner Objectives: Upon completion of this unit the resident:

- Knows the medico-legal aspects of surgical practice;
- Understands critical pathways and cost-benefit analysis in clinical decision making;
- Understands the time constraints imposed by the responsibilities of practice and the need for effective time management.

2nd Year ACGME Core Competencies

1. 2nd Year - Communication & Interpersonal skills (all 1st year + ...) :
   1. Counsel patients on the risks, goals, limits, and alternatives to most thoracic and cardiac surgical procedures.
   2. Demonstrate the ability to interact with many different health care personnel with efficiency and efficacy in the pursuit of patient care and service management.
   3. Describe the ethical issues that are involved in the treatment of patients with life-threatening illnesses.
   4. Exchange information effectively and team with patients, their families, and other health professionals.
   5. Learn the essentials of obtaining consents for research trials and be able to cooperate with ongoing studies.
   6. Show evidence of intermediate and long term planning for professional development.
   7. Work effectively within a health care team in both inpatient and outpatient settings.

2. 2nd Year - Practice based learning and improvement (all 1st year + ...) :
   1. Be able to guide your junior resident through the placement of central lines, arterial lines, chest tubes, etc.
   2. Demonstrate an ongoing and improving ability to learn from errors.
   3. Develop problem solving skills that can be used to design, implement, analyze, and report basic science research that is relevant to the clinical arena.
   4. Identify areas of surgical practice where current knowledge is inaccurate or inadequate and participate in clinical studies to improve the general fund of knowledge in thoracic and cardiac surgery.
   5. Learn significant features of outcomes research and clinical epidemiology.
   6. Operate with economical and fluid maneuvers.

3. 2nd Year – Professionalism (all 1st year + ...) :
   1. Be able to write medically appropriate, legible, and error free orders for complex cases, including those going to the intensive care unit.
   2. Be familiar with ethical issues such as informed consent, patient’s rights, end of life issues, etc.
   3. Establish and maintain professional and therapeutic relationships with patients and healthcare team members.
4. Maintain high standards of ethical behavior, demonstrate a commitment to continuity of patient care, and demonstrate sensitivity to age, gender, and culture of patients and other health care professionals.

5. Participate meaningfully in ongoing professional development by submitting research for peer review to journals and national professional meetings.

6. Set the standard for your team in terms of cordiality and respect toward patients, fellow residents, and ancillary staff.

4. 2nd Year - Patient Care (all 1st year + ...) :
   1. Develop appropriate judgment and involve your senior/chief resident and attending.
   2. Establish and implement effective patient-care plans, assuming the role of primary leader on the thoracic and cardiac surgery service, under appropriate supervision of an attending surgeon.
   3. Make patient management plans and decisions for somewhat complex cases under the supervision of more senior residents and attending staff guidance.

5. 2nd Year - System Based Practice (all 1st year + ...) :
   1. Advocate high-quality patient care, assist patients and the responsible junior residents in dealing with system complexities.
   2. Begin to practice "Evidence Based Medicine" through the use of Practice Guidelines and Clinical Pathways.
   3. Deliver patient care with an understanding of cost vs. benefit considerations, medical economics, outcome analysis, quality improvement, and medico-legal issues.
   4. Demonstrate an understanding of practice opportunities, practice types, health care delivery systems, and medical economics though participation at a chief level in a variety of health care delivery settings (VUH, VCH, VA).
   5. Develop proficiency in the rational use of surgical literature and evidence-based medicine (defends discussions and recommendation with scientific evidence).
   6. Practice high quality, cost effective patient care; demonstrate knowledge of risk-benefit and cost-benefit analysis, medical economics, outcomes analysis, and quality improvement.
   7. Demonstrate an understanding of the role of different specialists and other health care professionals in overall patient management.