GENERAL GOALS AND OBJECTIVES

CORE COMPETENCIES GOALS AND OBJECTIVES

Core competencies Goals are shown below for (1) Patient Care, (2) Medical Knowledge, (3) Communication and Interpersonal Skills, (4) Practice based learning and Improvement, (5) Professionalism, and (6) Systems-based practice.

These objectives amplify the expectations of the ACGME General Competencies and apply to residents at all levels. The objectives characterize the general requirements for successful completion of our residency program. A continuum of achievement in accomplishing these goals throughout the residency education training will serve as one indicator of satisfactory progress. Residents are expected to build upon skills and techniques learned in previous years.

These goals will be taught by self-directed reading, resident conferences, and demonstrations by the faculty. Opportunity for observation by the resident, and practice will be provided. These skills will be evaluated by the faculty. As often as daily, feedback will be provided.

PATIENT CARE AND MEDICAL KNOWLEDGE

- Developing a sound understanding of the pathophysiology of thoracic and cardiac diseases, including acquiring an in-depth knowledge of the management of critically ill and critically injured patients including the literature supporting various particle approaches.
- Mastering the use of various technologies for cardiopulmonary support, and monitoring in the cardiac and thoracic units.
- Confidently applying therapeutic interventions in a variety of settings including outpatient clinic, general and patient wards, intensive care unit, operating room, and in various perioperative areas.
- Developing the administrative skills necessary to direct patient care within a cardiac or thoracic intensive care unit.
- Acquiring sound clinical decision making and surgical judgment.
- Enhancing professional behavior, and communication and interpersonal skills inside and outside the operating room.

PRACTICE BASED LEARNING

- Develop a personal program of self-study and professional growth with guidance from the teaching staff and faculty advisor. An understanding of the etiology, pathogenesis, pathophysiology, diagnosis and management of cardiac and thoracic surgical disorders is absolutely necessary. This will allow for sound surgical judgment which relies on knowledge, rational thinking and the surgical literature.
- Participate in teaching and organization of the educational conferences and activities of the Department of Thoracic Surgery and the Department of Cardiac Surgery and assume responsibility for teaching and supervision of subordinate surgical house staff, and medical students.

PROFESSIONALISM

- Participate in compassionate patient care maintaining the highest moral and ethical values with a professional attitude. The resident should be sensitive to the needs and feelings of others, including the patient's family members, allied health care personnel (nurses, clerical staff, etc.), fellow residents, and medical students.
- Demonstrate respect, compassion and integrity in the care of patients on a daily basis.
- Show sensitivity to patients' culture, age, gender and disabilities.

INTERPERSONAL RELATIONSHIPS AND COMMUNICATION SKILLS

- Create and sustain a therapeutic and ethically sound relationship with patients to include both counseling and education of patients and families.
- Work effectively with other members of the medical team including faculty, colleagues (co-residents), allied health care personnel (nurses, clerical staff, etc.), fellow residents, and medical students.
- Maintain professional interactions with other health care providers and hospital staff.

SYSTEMS BASED PRACTICE

- Understand how the health care organization affects surgical practice.
- Demonstrate cost effective health care.
- Knows how to partner with health care managers and allied health personnel to improve healthcare.
- Follow established practices, procedures, and policies of the Department of Thoracic Surgery, and the Department of Cardiac Surgery and integrated and affiliated hospitals.
- Completion of medical records operative notes staff sheets and notes, patient database cards and other patient care related documentation in a timely, accurate and succinct manner.

GOALS AND OBJECTIVES – YEAR 1

ADULT CARDIAC SURGERY ROTATION YEAR 1

X. CARDIOPULMONARY BYPASS AND COAGULATION - BLOOD PRODUCTS

A. Physiology of Cardiopulmonary Bypass (CPB)

Learner Objectives: Upon completion of the unit the resident: (What resources do the residents have for this information?)

- Understands the physiology and mechanics of membrane and bubble oxygenators;
- Understands the mechanics and operation of roller and vortex pumps;
- Understands the physiology of various CPB circuits and the derangements caused by their use;
- Knows the coagulation system and alterations of blood elements. Specifically the desired manipulation for maintenance of adequate anticoagulation while on CPB

Clinical Skills: During the training program the resident:

- Uses knowledge of the effects of CPB to ensure its safe use;
- Recognizes the correct and incorrect set-up and operation of an extracorporeal circuit and understands the components of a conventional CPB circuit (eg. Venous drainage, arterial perfusion, cardiotomy suction, cardioplegia, heater-cooler etc);
- Plans and uses extracorporeal circuits in clinical practice;
- Understands and treats physiologic derangements caused by blood-artificial surface interaction.

B. Techniques of Cardiopulmonary Bypass

Learner Objectives: Upon completion of the unit the resident:

- Understands the standard techniques for CPB;
- Understands the indications and techniques of cannulation for CPB (eg. Central, bicaval, peripheral);
- Oversees the management of patients undergoing CPB.

Clinical Skills: During the training program the resident:

- Performs cannulation for CPB using appropriate access routes and techniques.

C. Mechanical Support

Learner Objectives: Upon completion of the unit the resident:

- Understands the indications for cardiac support with mechanical devices or ECMO (bridge to transplant, bridge to decision, or destination therapy);
- Understands to the spectrum of mechanical support (e.g., intra-aortic and balloon pump, temporary mechanical support devices, ECMO, and durable long term mechanical devices);
- Understands the principles of weaning patients from these devices, or secondary therapies.

Clinical Skills: During the training program the resident:

- Evaluates and participates in the preoperative and postoperative management of patients requiring mechanical support;
- Manages the complications from the use of mechanical support and ECMO;
- Manages the anticoagulation of patients on mechanical support and ECMO.

D. Fundamentals of Coagulation Management and Blood Component Therapy

Learner Objectives: At the end of the unit the resident:

- Understands the major blood groups, the clotting cascade, and the pathophysiology of clotting (e.g., abnormal clotting, activation of compliment, Kallikrein, prostanoids etc);
- Understands the specific hemorrhagic and thrombotic complications of cardiac surgery and their management (eg. DIC, HIT(T);
- Understands the methods used in blood component storage and the measures taken to ensure a safe blood supply;
- Understands the use of specific blood components to treat abnormalities of red cell quantity and quality, platelet quantity and quality, and coagulation function;
- Knows the preoperative risk factors for excessive blood loss and blood utilization;
- Understands the operative and postoperative techniques to ensure blood conservation.

Clinical Skills: During the course of the program, the resident:

- Evaluates patients requiring component therapy and develops management strategies to correct abnormalities of the coagulation system;
- Uses appropriate tests to ensure the safety of blood and blood components;
- Uses appropriate blood conservation techniques.

XI. ACQUIRED HEART DISEASE

A. Coronary Artery Disease

Unit Objective: At the end of this unit the resident understands the anatomy and physiology of coronary circulation, the pathophysiologic causes and derangement of ischemic heart disease and the sequelae of coronary events, and performs comprehensive short and long term management.

Learner Objectives: Upon completion of the unit the resident:

- Understands the anatomy and physiology of coronary circulation and the physiologic derangements caused by stenosis and obstruction;
- Understands the risks and complications of coronary artery bypass operations, coronary angiography, and percutaneous coronary artery balloon angioplasty;
- Understands the preoperative and postoperative care of patients undergoing coronary artery bypass grafting.

Clinical Skills: During the training program the resident:

- Evaluates patients with angina pectoris, unstable angina pectoris, and acute myocardial infarction;
- Reads and interprets invasive and non-invasive tests of patients with ischemic heart disease;
- Performs operative and non-operative management of patients with ischemic heart disease, including coronary artery bypass grafting using appropriate conduit.

B. Abnormalities of the Aorta

Learner Objectives: Upon completion of the unit the resident:

- Understands the anatomy and natural history of aneurysms of the aorta and the indications for surgical intervention (eg. Size, location, growth, dissection)
- Recognizes the potential morbidity and mortality associated with repair of aortic aneurysms or dissection and develops appropriate treatment strategies

C. Cardiac Arrhythmias

Clinical Skills: During the training program the resident:

- Performs the operative and non-operative management of patients with atrial arrhythmias;
- Participates in or performs operative management of patients with ventricular arrhythmias, including placement of automatic implantable cardioverter-defibrillator

D. Valvular Heart Disease

Learner Objectives: Upon completion of the unit the resident:

- Understands the normal and pathologic anatomy of the atrioventricular and semilunar valves;
- Understands the natural history, pathophysiology, and clinical presentation of each major valvular lesion (mitral stenosis and incompetence, aortic stenosis and incompetence, tricuspid stenosis and incompetence);
- Understands the preoperative and postoperative management of patients with valvular heart disease.

XII. THORACIC TRAUMA

A. Cardiovascular Trauma

Learner Objectives: Upon completion of the unit the resident:

- Evaluates patients who have sustained penetrating cardiovascular trauma;
- Evaluates patients who have sustained blunt cardiovascular trauma;
- Understands the physiology of deceleration injuries to the thoracic aorta;
- Understands both invasive and noninvasive methods for the diagnosis of cardiovascular traumatic injuries.

Clinical Skills: During the training program the resident:

- Evaluates and treats cardiac contusion (I don't know what this means);
- Manages injuries to the thoracic aorta and provides postoperative management

XIII. TRANSPLANTATION

A. Cardiac Transplantation

Learner Objectives: Upon completion of the unit the resident:

- Understands the relative and absolute indications and contraindications for cardiac transplantation;
- Recognizes the signs and symptoms of cardiac rejection and knows the appropriate management;
- Understands the evaluation and management of organ donors;
- Knows the methods of organ harvest and preservation.

Clinical Skills: During the training program the resident:

- Manages organ donors;
- Performs organ harvest and preservation;
- Evaluates transplant recipients for signs of rejection or infection and initiates appropriate therapy.

B. Heart-Lung Transplantation

Learner Objectives: Upon completion of the unit the resident:

- Understands the evaluation and management of heart-lung donors;
- Knows the methods for harvesting and preserving heart-lung blocs.

Clinical Skills: During the training program the resident:

- Participates in the evaluation and management of donors for cardiopulmonary transplantation;
- Performs heart-lung bloc harvesting and preservation;
- Manages transplant recipients preoperatively and postoperatively.

XV. MINOR PROCEDURES

A. Permanent Pacemakers

Clinical Skills: During the training program the resident:

- Understands contemporary nomenclature and taxonomy for pacing and defibrillator devices

GENERAL THORACIC SURGERY ROTATION YEAR 1

I. CHEST WALL

A. Anatomy, Physiology and Embryology (Milestone: Chest Wall - Medical Knowledge)

Learner Objectives: By the end of this rotation, each PRG1 resident will:

- Identify and describe the anatomy and physiology of the cutaneous, muscular, and bony components of the chest wall and their anatomic and physiologic relationships to adjacent structures;
- Identify and describe all operative approaches to the chest wall.

Clinical Skills: By the end of this rotation, each PRG1 resident will:

- Distinguish between the normal and abnormal anatomy of the chest wall;
- Describe treatment options for benign, malignant and traumatic disorders;
- Describe basic complications for benign and malignant disorders

B. Acquired Abnormalities and Neoplasms

Learner Objectives: By the end of this rotation, each PRG1 resident will:

- Evaluate and diagnose primary and metastatic chest wall tumors, identify their histologic appearance, and articulate the indications for incisional versus excisional biopsy;
- Describe the radiologic characteristics of tumors.

Clinical Skills: By the end of this rotation, each PRG1 resident will:

- Safely perform a variety of surgical incisions to expose components of the chest wall and interior thoracic organs.

C. Congenital Abnormalities and Thoracic Outlet Syndrome

Learner Objectives: By the end of this rotation, each PRG1 resident will:

- Recognize pectus excavatum and pectus carinatum, describe possible physiologic disturbances, and interpret diagnostic tests to identify such physiologic disturbances;
- Describe the indications for the operative treatment of congenital chest wall abnormalities;
- Describe the complications of reconstruction of congenital chest wall abnormalities and their management.

Clinical Skills: By the end of this rotation, each PRG1 resident will:

- Recognize the varied presentations of thoracic outlet syndrome and interpret diagnostic tests;
- Read and interpret diagnostic x-ray and perform physiologic examinations for congenital chest wall defects and thoracic outlet syndromes.

II. LUNGS AND PLEURA

A. Anatomy, Physiology, Embryology and Testing

Learner Objectives: Upon completion of this unit the resident:

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

B. Non-Neoplastic Lung Disease

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

- Understands diagnostic procedures used to evaluate non-neoplastic lung disease;

- Knows the common pathogens that produce lung infections, including their presentation and pathologic processes, and knows the treatment and indications for operative intervention;
- Understands the natural history, presentation and treatment of chronic obstructive lung disease;
- Understands the pathologic results and alterations of pulmonary function due to bronchospasm;
- Understands the mechanisms by which foreign bodies reach the airways, how they cause pulmonary pathology, and the management of patients with airway foreign bodies.

Clinical Skills: During the training program the resident:

- Diagnoses and treats patients with bacterial, fungal, tuberculous, and viral lung infections;
- Manages patients with chronic obstructive lung disease, bronchospastic airway disease, foreign bodies of the airways, and hemoptysis;
- Performs thoracentesis, mediastinoscopy, mediastinotomy, flexible and rigid bronchoscopy, thoracoscopy, and open lung biopsy.

C. Neoplastic Lung Disease

Learner Objectives: Upon completion of this unit the resident:

- Understands 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;
- Knows the signs of inoperability;
- Understands the complications of pulmonary resection and their management;
- Understands the indications for resection of benign lung neoplasms;
- Understands the indications for resection of pulmonary metastases.

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;
- Performs staging procedures (e.g., bronchoscopy, mediastinoscopy, mediastinotomy, and thoracoscopy);
- Performs operations to extirpate neoplasms of the lung (e.g., local excision, wedge resection, lobectomy);
- Performs bedside bronchoscopies and placement of tracheostomies and/or minitracheostomies;
- Recognizes and treats the early signs of non-cardiac pulmonary edema.

D. Diseases of the Pleura

Learner Objectives: Upon completion of this unit the resident:

- Is familiar with the clinical presentation of benign and malignant diseases of the pleura;
- Understands the types of pleural effusions, their evaluation and treatment;
- Understands the indications, contraindications, and complications of video assisted thoracic surgery and has a working knowledge of the equipment;

Clinical Skills: During the training program the resident:

- Evaluates pleural effusions and recommends appropriate therapy;

- Performs invasive diagnostic studies (e.g., incisional and excisional biopsy, needle biopsy, fluid analysis);
- Places tube thoracostomies and performs chemical or mechanical pleurodesis;
- Performs video assisted thorascopic surgery as necessary for the diagnosis and treatment of pleural disease;
- Places pleuroperitoneal shunts.

III. TRACHEA AND BRONCHI

A. Anatomy, Physiology and Embryology

Learner Objectives: Upon completion of this unit the resident:

- Understands the anatomy and blood supply of the trachea and bronchi;
- Understands the endoscopic anatomy of the nasopharynx, hypopharynx, larynx, trachea, and major bronchi;
- Understands and interprets pulmonary function studies of the trachea and bronchi;
- Understands 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;
- Performs endoscopy of the upper airway, trachea and major bronchi.

B. Congenital and Acquired Abnormalities

Learner Objectives: Upon completion of this unit the resident:

- Understands congenital abnormalities and idiopathic diseases of the trachea;
- Understands the etiology, presentation and management of acquired tracheal strictures and their prevention;
- Understands the radiologic evaluation of tracheal abnormalities.

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;
- Performs tracheostomy.

IV. MEDIASTINUM AND PERICARDIUM

A. Anatomy, Physiology and Embryology

Learner Objectives: Upon completion of this unit the resident:

- Understands the anatomic boundaries of the mediastinum and the structures found within each region;
- Understands the embryologic development of structures within the mediastinum and the variations and pathologic consequences of abnormally located structures;
- Understands the radiologic assessment of the mediastinum including CT scan, MRI, contrast studies, and angiography;
- Understands 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.

B. Congenital Abnormalities of the Mediastinum

Learner Objectives: Upon completion of this unit the resident:

- Is able to diagnose mediastinal cysts.

Clinical Skills: During the training program, the resident:

- Reads and interprets plain radiographs, CT scans, MRI's and contrast studies of congenital abnormalities of the mediastinum.

C. Acquired Abnormalities of the Mediastinum

Clinical Skills: During the training program the resident

- Performs diagnostic tests and operations on the mediastinum;
- Recognizes the histologic appearance of mediastinal tumors.

D. Congenital and Acquired Abnormalities of the Pericardium

Learner Objectives: Upon completion of this unit the resident:

- Understands the physiologic consequences of increased pericardial fluid 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;
- Performs diagnostic tests and therapeutic interventions for the treatment of pericardial tamponade, pericardial effusions, and constrictive pericardial disease.

V. DIAPHRAGM

A. Anatomy, Physiology and Embryology

Learner Objectives: Upon completion of this unit the resident:

- Knows the embryologic origin of the diaphragm;
- Understands the anatomy of the diaphragm and adjacent structures;
- Understands the neural and vascular supply of the diaphragm and the pathologic consequences of injury;
- Understands imaging studies for assessing 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.

B. Acquired Abnormalities, Neoplasms

Learner Objectives: Upon completion of this unit the resident:

- Knows evaluation methods for penetrating injuries of the diaphragm;
- Understands the etiology, diagnosis, and treatment of diaphragmatic paralysis.

Clinical Skills: During the training program the resident:

- Interprets plain and contrast x-rays, fluoroscopy, CT scans, and MRI of the diaphragm;
- Performs diagnostic studies of the diaphragm (e.g., pneumoperitoneum, direct incisional and excisional biopsy, video assisted thoracoscopic surgery).

C. Congenital Abnormalities

Learner Objectives: Upon completion of this unit the resident:

- Understands the anatomy of congenital diaphragmatic hernias;
- Understands the physiologic consequences of diaphragmatic hernias;
- Knows the indications for operative repair of diaphragmatic hernias.

Clinical Skills: During the training program the resident:

- Evaluates neonates with congenital diaphragmatic hernias;
- Performs or participates in the operative treatment of infants with diaphragmatic hernias;
- Participates in the preoperative and postoperative management of multisystem abnormalities of infants with congenital diaphragmatic hernias;
- Performs operative treatment of adults with delayed presentation of diaphragmatic hernias;
- Manages eventration of the diaphragm in children and adults.

VI. ESOPHAGUS

A. Anatomy, Physiology and Embryology

Learner Objectives: Upon completion of this unit the resident:

- Understands the anatomy, embryology, innervation, and vascular supply of the esophagus and adjacent structures;
- Understands the physiologic function of the esophagus and pharynx;
- Understands 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 echo;
- Orders and interprets manometric and pH studies of the esophagus;
- Performs rigid and flexible endoscopy of the pharynx and esophagus.

B. Acquired Abnormalities

Learner Objectives: Upon completion of this unit the resident:

- Understands the pathophysiology, histology, complications, and diagnosis of esophageal reflux;
- Understands the indications for and principles of anti-reflux operations;
- Understands the clinical presentation, diagnosis, and management of paraesophageal hernias;
- Knows the clinical presentation, causes, diagnosis, and treatment of motility disorders of the esophagus;
- Understands the clinical presentation, diagnosis, and management of esophageal perforation;
- Understands the clinical presentation, diagnosis, and management of chemical injuries and trauma of the esophagus.

Clinical Skills: During the training program the resident:

- Interprets esophageal plain radiographs, contrast studies, CT scans, MRI, manometry, pH studies, and intraluminal echo;
- Performs esophagoscopy, foreign body removal and biopsy;
- Uses various operative approaches to different parts of the esophagus;
- Performs anti-reflux operations including management of strictures;
- Performs 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.

C. Neoplasms

Learner Objectives: Upon completion of this unit the resident:

- Understands the types of benign esophageal neoplasms, their clinical presentation, diagnosis, and treatment;
- Understands the types of malignant esophageal neoplasms, their clinical presentation, diagnosis, histologic appearance, and treatment;
- Understands the TNM staging of esophageal cancer;
- Understands the principles of patient management after esophageal resection;
- Understands the nutritional management of patients with esophageal neoplasms.

Clinical Skills: During the training program the resident:

- Evaluates malignant and benign esophageal tumors and recommends overall management, including neoadjuvant therapy;
- Performs diagnostic tests for esophageal neoplasms and correlates the results with clinical staging;
- Performs esophagectomy through various approaches;
- Performs reconstruction with various esophageal substitutes;
- Diagnoses and manages complications of esophageal surgery;
- Manages nutritional needs after esophageal surgery;
- Performs palliative operations for obstructing esophageal lesions.

VII. THORACIC TRAUMA

A. Trauma of the Chest Wall

Learner Objectives: Upon completion of this unit the resident:

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

Clinical Skills: During the training program the resident:

- Evaluates and treats chest wall injuries;
- Performs emergency operations to repair chest wall injuries and provides postoperative management.

B. Tracheobronchial and Pulmonary Trauma

Learner Objectives: Upon completion of this unit the resident:

- Understands clinical presentation and radiologic findings of tracheobronchial injury;
- Understands the principles of airway management;
- Understands the bronchoscopic findings of tracheobronchial and pulmonary injury;
- Understands the 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;
- Performs non-operative management of pulmonary contusion;
- Performs emergency operations to repair peripheral pulmonary and hilar injuries;
- Uses precautions to avoid air embolism in patients with penetrating and blunt injuries.

C. 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.

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.

D. Diaphragmatic Trauma

Learner Objectives: Upon completion of this unit the resident:

- Understands the presentation, evaluation, and treatment of blunt and penetrating diaphragmatic injuries;
- Understands the evaluation and management of associated injuries.

Clinical Skills: During the training program the resident:

- Performs emergency evaluation and diagnosis of diaphragmatic and associated injuries;
- Performs operative repair of acute and chronic diaphragmatic and associated injuries.

VIII. TRANSPLANTATION

A. Lung Transplantation

Learner Objectives: Upon completion of the unit the resident:

- Understands the evaluation and management of organ donors;
- Recognizes the signs and symptoms of lung rejection or infection and knows the appropriate management;
- Knows the methods for harvesting and preserving donor lungs.

Clinical Skills: During the training program the resident:

- Performs or participates in donor evaluation and management;
- Performs or participates in 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.

IX. MINOR PROCEDURES

A. Bronchoscopy

Learner Objectives: Upon completion of this unit the resident:

- Understands the 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;
- Performs rigid and fiberoptic bronchoscopy using various anesthetic techniques;
- Obtains diagnostic material using various biopsy techniques;
- Uses laser techniques via bronchoscopy;
- Uses stents via bronchoscopy.

B. Esophagoscopy

Learner Objectives: Upon completion of this unit the resident:

- Understands the indications, techniques, and complications of rigid and fiberoptic esophagoscopy.

Clinical Skills: During the training program the resident:

- Evaluates and manages patients requiring esophagoscopy;
- Performs rigid and fiberoptic esophagoscopy using various anesthetic techniques;
- Uses laser techniques via esophagoscopy;
- Uses stents via esophagoscopy.

C. Tube Thoracostomy

Learner Objectives: Upon completion of this unit the resident:

- Understands the indications and contraindications for tube thoracostomy;
- Knows the techniques and complications of tube thoracostomy and their management.

Clinical Skills: During the training program the resident:

- Evaluates patients for tube thoracostomy;
- Performs tube thoracostomy under local, regional and general anesthesia;
- Treats the complications of tube thoracostomy.

E. Central Venous Lines and Arterial Lines

Learner Objectives: Upon completion of this unit the resident:

- Understands the indications, contraindications, management and complications of central venous lines and arterial lines.

Clinical Skills: During the training program the resident:

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

GOALS & OBJECTIVES – YEAR 2

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.

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 pulmonaryfunction 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).

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.

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.

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.

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 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.

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.

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

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.
- Has knowledge of the current and relevant studies related to coronary revascularization (Syntax, Freedom, Coronary, BARI, SOS, RUBY etc)

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 appropriate conduit;
- Directs the critical care management of preoperative and postoperative patients with ischemic heart disease;
- Understand the appropriate secondary prevention medications for patients with coronary artery disease and have a familiarity with the evidence behind their use.

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;
- Understands echocardiography, cardiac catheterization, endomyocardial biopsy, and donor heart harvesting. (Again this is unrealistic that the cardiac fellows would be doing cardiac caths, or biopsies during their fellowship)

C. Abnormalities of the Aorta

Learner Objectives: Upon completion of the unit the resident:

- Understands the etiology, physiology and natural history 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:

- Demonstrates understanding of 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;
- Understands the anticoagulation profile and considerations for common valve prostheses and repair devices.
- 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; (again, participation in performing caths is unlikely on a cardiac surgical rotation)
- 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.

X. TRANSPLANTATION

Thoracic Surgery Fellowship Goals & Objectives

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.
- Participates in the evaluation of potential donors

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.
- Participate in procurement of donor organs for heart and lung transplantation

B. 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/rejection.

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.
- Understands the spectrum of mechanical support devices and their relative indications and contraindications.

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; bridge to decision and as destination therapy
- Knows the requirements for anticoagulation and monitoring of blood trauma.

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:

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

PEDIATRIC CARDIAC SURGERY ROTATION YEAR 2

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, cortriatriatum, 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-topulmonary 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 hypertensivecrises.

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.

GOALS & OBJECTIVES – YEAR 3

GENERAL THORACIC SURGERY ROTATION YEAR 3

I. CHEST WALL

Thoracic Surgery Fellowship Goals & Objectives

A. Anatomy, Physiology and Embryology

Clinical Skills: During the training program the resident:

- Performs operations utilizing major chest wall flaps and the correct application of prosthetic materials.

B. Acquired Abnormalities and Neoplasms

Learner Objectives: Upon completion of this unit the resident:

- Knows the indications for and methods of prosthetic chest wall reconstruction (e.g., methyl-methacrylate, Marlex®, Gortex®, Vicryl®, and Dacron® mesh);
- Knows the management of osteoradionecrosis of the chest wall.

Clinical Skills: During the training program the resident:

- Identifies the need for prosthetic replacement of the chest wall;
- Performs surgical reconstruction of chest wall defects.

C. Congenital Abnormalities and Thoracic Outlet Syndrome

Clinical Skills: During the training program the resident:

- Manages intraoperative and postoperative complications associated with the repair of congenital chest wall abnormalities and thoracic outlet syndrome;
- Performs re-operations for thoracic outlet syndrome.

II. LUNGS AND PLEURA

A. Non-Neoplastic Lung Disease

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

- Knows the complications of lung resection and their management.

B. Neoplastic Lung Disease

Learner Objectives: Upon completion of this unit the resident:

- Understands the principles of bronchoplastic surgery.

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).

C. Congenital Lung Disease

Clinical Skills: During the training program the resident:

- Performs operations for congenital lung abnormalities and their complications.

D. Diseases of the Pleura

Learner Objectives: Upon completion of this unit the resident:

- Understands the treatment of benign and malignant diseases of the pleura.

Clinical Skills: During the training program the resident:

- Performs pleural stripping for mesothelioma.

III. TRACHEA AND BRONCHI

B. Congenital and Acquired Abnormalities

Learner Objectives: Upon completion of this unit the resident:

- Understands the etiology, presentation, diagnosis and management of tracheoesophageal fistulas and tracheoinnominate artery fistulas;
- Knows the operative approaches to the trachea and techniques of mobilization;
- Knows the methods of airway management, anesthesia and ventilation for tracheal operations;
- Understands the complications of tracheal surgery and their management.

Clinical Skills: During the training program the resident:

- Performs tracheal resection and reconstruction for tracheal stenosis;

C. Neoplasms

Learner Objectives: Upon completion of this unit the resident:

- Understands the radiologic evaluation and operative management of tracheal neoplasms;
- Understands the methods of airway management.

Clinical Skills: During the training program the resident:

- Performs resection of tracheal tumors;
- Manages patients and their airways after tracheal resection.

IV. MEDIASTINUM AND PERICARDIUM

A. Congenital Abnormalities of the Mediastinum

Learner Objectives: Upon completion of this unit the resident:

- Knows the indications for operations involving the mediastinum and the anatomic approaches.

Clinical Skills: During the training program, the resident:

- Performs operations for congenital abnormalities of the mediastinum.

B. Acquired Abnormalities of the Mediastinum

Learner Objectives: Upon completion of this unit the resident:

- Understands mediastinal infections and their management;
- Understands the diagnostic tests available;
- Recognizes the histologic appearance of benign and malignant mediastinal neoplasms;
- Understands the neoplastic and non-neoplastic mediastinal diseases;
- Understands the operative management of benign and malignant mediastinal neoplasms;
- Understands chemotherapy and radiotherapy in mediastinal neoplasm management.

Clinical Skills: During the training program the resident

- Manages patients with mediastinal tumors.

V. DIAPHRAGM

A. Acquired Abnormalities, Neoplasms

Learner Objectives: Upon completion of this unit the resident:

- Understands reconstruction methods for the diaphragm;
- Understands the indications for and techniques of diaphragmatic pacing.

Clinical Skills: During the training program the resident:

- Performs diaphragmatic mobilization for exposure of the spine and aorta;
- Performs operative removal of diaphragmatic tumors;

VI. ESOPHAGUS

A. Acquired Abnormalities

Learner Objectives: Upon completion of this unit the resident:

- Understands the presentation and management of complications of esophageal operations;

VIII. TRANSPLANTATION

A. Lung Transplantation

Learner Objectives: Upon completion of the unit the resident:

- Knows the techniques of single and double lung transplantation.

VII. ACQUIRED HEART DISEASE

A. Coronary Artery Disease

Learner Objectives: Upon completion of the unit the resident:

- Understands the rationale for and techniques of coronary artery bypass operations as well as the use of various conduits.

Clinical Skills: During the training program the resident:

- Participates in or performs surgery for the complications of myocardial infarction.

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

Learner Objectives: Upon completion of the unit the resident:

- Understands the types of cardiac tumors (frequency, anatomic location, physiologic and pathologic derangements, diagnostic methods and surgical management);
- Understands myocarditis (causes, physiologic changes, treatment, prognosis, and radiographic, EKG and echocardiographic changes);
- Understands hypertrophic cardiomyopathy (genetic linkage, pathologic and anatomic changes, physiologic derangements, clinical features, diagnostic tests, natural history, medical and surgical treatment);
- Knows the types of cardiomyopathies (causes, natural history, diagnostic methods, operative and nonoperative treatment);

- Understands cardiac transplantation (immunology/rejection and treatment, physiology, indications, operative techniques, diagnostic techniques in followup).

Clinical Skills: During the training program the resident:

- Participates in or performs operative excision of cardiac tumors;
- Participates in or performs operations for the treatment of HCM when indicated;
- Participates in or performs heart transplants and provides preoperative and postoperative care.

C. Abnormalities of the Aorta

Clinical Skills: During the training program the resident:

- Participates in or performs operative and non-operative management of thoracic aortic disease, including aneurysms, dissections, and occlusive disease Plans and directs the use of extracorporeal bypass, hypothermia, and circulatory arrest for aortic diseases.

D. Cardiac Arrhythmias

Learner Objectives: Upon completion of the unit the resident:

- Understands operative and non-operative management;
- Knows the indications for and techniques of electrophysiologic studies and the application of this information to patient management.

B. Heart-Lung Transplantation

Learner Objectives: Upon completion of the unit the resident:

- Knows the operative techniques of heart-lung transplantation.

Clinical Skills: During the training program the resident:

- Demonstrates understanding of and/or participates in heart-lung transplantation;
- Performs endobronchial biopsy, thoracoscopic biopsy of the lung, and endocardial biopsy of cardiopulmonary transplantation patients, as indicated.

IX. EXTRACORPOREAL BYPASS AND COAGULATION - BLOOD PRODUCTS

A. Techniques of Extracorporeal Bypass

Clinical Skills: During the training program the resident:

- Uses left and right heart bypass.

B. Mechanical Support

Learner Objectives: Upon completion of the unit the resident:

- Understands Federal regulations that apply to the use of these devices.

Clinical Skills: During the training program the resident:

- Uses appropriate mechanical cardiac support and ECMO;

- Weans patients from mechanical support and ECMO;
- Manages patients bridging to transplantation.
- Participates in comprehensive evaluation of potential VAD and transplant patients

X. MINOR PROCEDURES

A. Permanent Pacemakers

Learner Objectives: Upon completion of this unit the resident:

- Understands phrenic nerve pacing
- Understands cardiomyoplasty pacing techniques

Clinical Skills: During the training program the resident:

Implants diaphragmatic pacemakers.