The Mount Sinai School of Medicine  
Department of Cardiothoracic Surgery  
Residency Training Program

### INDEPENDENT Program Format YEAR 1

<table>
<thead>
<tr>
<th>Period</th>
<th>1 month</th>
<th>3 months</th>
<th>8 months</th>
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<tbody>
<tr>
<td>Site</td>
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<tr>
<td>Service</td>
<td>ICU</td>
<td>Adult Cardiac Surgery</td>
<td>General Thoracic Surgery</td>
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<tr>
<td>Inpatient / Outpatient</td>
<td>I</td>
<td>I/O</td>
<td>I/O</td>
</tr>
<tr>
<td>Exposure</td>
<td>2 weeks echo</td>
<td>2 weeks cath</td>
<td>1 week perfusion</td>
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### INDEPENDENT Program Format YEAR 2 CARDIAC TRACK

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<tr>
<td>Site</td>
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<td>Service</td>
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<tr>
<td>Inpatient / Outpatient</td>
<td>I/O</td>
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### INDEPENDENT Program Format YEAR 2 THORACIC TRACK

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<td>Service</td>
<td>Thoracic Surgery Chief Resident</td>
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<td>Inpatient / Outpatient</td>
<td>I/O</td>
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<td>Exposure</td>
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**Overall Educational Goals and Objectives**

The overall educational goals of this two year program are to provide the graduating resident with the professional, academic and interpersonal knowledge and skills necessary to be a competent and safe independent practicing thoracic surgeon; enabling the resident to meet training and operative requirements for American Board of Thoracic Surgery (ABTS) eligibility. The two year format allows residents to focus their training on either a thoracic or cardiac track, providing a broad platform of experience from which residents may elect to enter independent practice directly, or pursue additional super-specialty training. The overall educational goals may be considered in terms of the six ACGME competencies.

**Patient Care**

This program will provide the resident with an outstanding, academic faculty-led, clinical training based on a structured system of graduated supervision, high-quality didactic teaching and professional and academic mentorship. The resident will be trained to proficiency in core cardiac and thoracic skills, and basic competency in more advanced procedures, enabling them to practice independently in a safe fashion in either general cardiac or general thoracic surgery after successful graduation from the program. They will have an excellent skills base on which to build specialist knowledge in further advanced cardiac or thoracic training in super-specialist areas such as congenital cardiac surgery, thoracic transplant, ventricular assist device surgery, complex mitral and aortic reconstruction, endovascular surgery or minimally invasive esophageal resection.

**Medical Knowledge**

This program is designed to enable residents to acquire an in depth knowledge and understanding of the curriculum required to pass the ABTS certifying examination, as well as the scientific principles underlying both clinical practice in cardiac and thoracic surgery.

**Practice Based Learning & Improvement**

An in depth practical understanding of critical appraisal of the literature, principles of study design, data analysis and scientific writing, as well as confidence utilizing a wide range of educational resources to examine and improve their patient care practices based on scientific evidence are key educational goals of this program.

**Interpersonal & Communication Skills**

The resident will be fully trained to communicate effectively and compassionately with patients and their families in all circumstances, interact with peers and colleagues in an effective, collegiate and professional manner, and have a practical understanding of principles and practice of teaching, presentation and scientific writing.

**Professionalism**

Development of a strong work ethic, personal integrity, and commitment to the highest standards of patient care and consistent demonstration of sensitivity and respect for age, sex, race and culture of patients together with a commitment to providing equal health care to all patients are
key goals of this program. Graduating residents will maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

*Systems Based Practice*

The final goal of this program is for residents to understand and practice high quality, cost effective patient care, selecting appropriate treatment options for patients based on risk-benefit analysis, and utilizing other clinical services judiciously.

*Organization of the Program*

The curriculum requirements of the American Board of Thoracic Surgery form the basis of rotations, teaching, and evaluations throughout the 2 year program. Emphasis is on adult cardiac surgery or general thoracic surgery according to resident track. Twice weekly didactic teaching is organized for all residents throughout the 2 year program following the weekly TSDA curriculum topics. Residents are expected to follow the TSDA pre-requisite curriculum in the final year of their general surgery residency program.

*Year 1*

Residents start with a 4 week full-time rotation on the Cardiothoracic Surgery Intensive Care Unit, designed to consolidate their intensive care training in general surgery residency, and provide the core cardiothoracic critical care skills and knowledge base necessary to participate safely in patient care. Knowledge of cardiothoracic critical care gained during this rotation is consolidated throughout the remaining 2 years by taking regular supervised then independent on-call, by rounding daily on ICU patients and by regular critical care teaching.

The next three months are spent gaining core skills in adult and pediatric cardiac surgery. Early experience in adult cardiac surgery is necessary to ensure firstly that residents have the time to gain the necessary operative maturity to become safe and competent independent cardiac surgeons within a two year program. It also enables thoracic track residents to acquire cardiac operative skills that they can continue to build on throughout the program, and to enable them to meet the ABTS cardiac operative requirements. Additionally, early cardiac surgery experience enables residents to take responsibility for the post-operative management of all critical care patients from an early stage.

The next eight months are spent in general thoracic surgery. Thoracic track residents who will spend the second year in general thoracic surgery have the opportunity to continue to perform selected cardiac operations to ensure their log-books achieve a suitable balance of cases. Cardiac track residents can take this time to focus on acquiring strong thoracic skills, consolidating their cardiac surgical skills and developing the clinical and operative maturity to maximize the adult cardiac surgical training opportunity afforded by the second year. By the end of the first year, residents will be familiar with core knowledge and skills in critical care, adult and pediatric cardiac surgery and general thoracic surgery.

*Year 2*

Residents pursue either 12 months of general thoracic surgery or cardiac surgery in their second year depending on their planned career track. The second year fellow is Chief Resident, and progressive responsibility for organizing the service to which they are attached. The TSDA weekly curriculum continues to provide the basis of didactic sessions in both cardiac and thoracic surgery. By the end of the second year, residents have a comprehensive understanding of the ABTS curriculum in adult and pediatric cardiac surgery, general thoracic surgery and critical care; will have met board requirements for either cardiac or thoracic track trainees in all areas, and be able to demonstrate proficiency in the 6 ACGME core competency areas.
Goals and Objectives for Each Rotation

Year 1: Cardiothoracic Surgical Intensive Care

Timeframe: 4 weeks in Year 1

This time is spent as a full-time rotation in the service described below:

The Cardiothoracic Surgery Intensive Care Unit currently has 32 beds including 12 acute cardiothoracic surgery ICU beds, 6 – 10 beds for longer term patients requiring cardiothoracic ICU, 6 PICU beds and 4 thoracic ICU beds on 7W. There is a full time faculty of 5 cardiothoracic intensivists, with occasional anesthesia fellows rotating through.

The aim of this 4 week rotation is to consolidate the critical care skills and knowledge acquired in General Surgery Residency training, and develop skills specific to the effective perioperative management of cardiothoracic patients. At the end of this rotation residents will start to participate in the on-call schedule, initially partnered with the Chief Resident, and then independently once their skills and knowledge level is appropriate.

• Patient Care

1. The resident should demonstrate an understanding of the principles of critical care of surgical patients and cardiac critical care by being able to:

   a. Join attending and resident staff in contributing to daily rounds which include case discussions, bedside teaching of physical examination, and review of active pharmacotherapy and synthesis of relevant laboratory, noninvasive and invasive medical data.
   
   b. Participate in medical order writing and all procedures performed in the unit with appropriate supervision according to their skill levels.
   
   c. Learn how to manage critically ill patients and understand the interrelationship and problems of the various organ systems during the patient’s stay in the ICU.
   
   d. Use the common medications used in an ICU setting including: vasopressors, antiarrhythmics, inotropes, diuretics, antibiotics, anti-hypertensives.
   
   e. Learn the principles of nutritional support, both enteral and parenteral.
   
   f. Monitor and manage various problems of the cardiac system and circulation with particular reference to post-cardiotomy patients, including cardiac arrest, and emergency resternotomy.
   
   g. Gain proficiency in hemodynamic monitoring and advanced management of hemodynamic problems including transcutaneous and epicardial pacing.
   
   h. Manage the airway and respiratory conditions of critically ill patients. (The staff of the ICU includes trained anesthesiologists who teach the residents the principles and the techniques of intubation and airway management).
   
   i. Learn to assess pulmonary function, pulmonary function tests, and respirator management including learning to augment support effectively and how to wean patients from ventilators.
   
   j. Provide initial assessment and management of respiratory failure and acute respiratory distress syndrome.
   
   k. Learn to manage disorders of fluid and electrolytes as well as acid-base disorders.
   
   l. Manage acute and chronic renal insufficiency and acute and chronic dialysis.
   
   m. Gain basic proficiency in the management of and the methods of placement of central venous catheters, arterial lines, Swan-Ganz catheters, pulse oximetry, and end tidal carbon dioxide monitors.
   
   n. Acquire proficiency in the performance of tracheostomies and bronchoscopies.
2. The resident will develop competency in core cardiothoracic ICU skills by:

a. Participating in emergency resuscitation including emergency resternotomy for tamponade or bleeding on the ICU and in the OR.
b. Gaining proficiency in peripheral venous cannulation and arterial blood gas sampling; central venous, pulmonary artery and peripheral arterial cannulation.
c. Assisting bedside tracheostomy placement and performing bronchoscop y.
d. Gaining proficiency in endotracheal intubation, as well as manual bag-and-mask ventilation.
e. Acquiring proficiency in defibrillation and D.C. cardioversion.
g. Performing tube thoracentesis and needle aspiration.

• **Medical Knowledge**

As part of this service the cardiothoracic resident is expected to:

a. Adhere to the Thoracic Surgery Directors Association (TSDA) weekly Requisite Curriculum Readings, and attend conferences and teaching sessions regularly.
b. Demonstrate a detailed knowledge of the basic sciences underpinning the cardiovascular and respiratory systems.
c. Display a comprehensive knowledge of the pathophysiology of the central nervous, renal, gastrointestinal, endocrine and immune systems relevant to critical care.
d. Acquire familiarity with the perioperative assessment and management of the following commonly occurring conditions:
   i. Coronary artery disease
   ii. Valvular heart disease
   iii. Lung and esophageal cancer
   iv. Cardiorespiratory arrest in the post-operative patient
   v. Diseases of the pleura
   vi. Complications of cardiopulmonary bypass
   vii. Bleeding, coagulopathy and the sequelae of transfusion
   viii. Tamponade
   ix. Arrhythmias
   x. Myocardial ischemia
   xi. Respiratory failure
   xii. Pneumonia, pneumothorax, pulmonary embolism
   xiii. Sepsis
   xiv. Renal failure
   xv. Liver failure
   xvi. Major gastrointestinal complications
   xvii. Multiorgan dysfunction, systemic inflammatory response syndromes
   xviii. Vasoplegia
   xix. Stroke, delirium

• **Practice Based Learning & Improvement**

The resident will:
a. Learn to utilize a variety of educational resources to examine and improve their patient care practices based on scientific evidence.
b. Attend and actively participate in department and team conferences where they learn how to critically review the current literature.
c. Identify potential topics for quality improvement audits or retrospective studies to examine practice patterns in the institution.

• **Interpersonal & Communication Skills**

The resident will:

a. Know how to communicate with patients and their families regarding surgical procedures and medical status of the patient.
b. Participate actively in the process of obtaining informed consent.
c. Inform patients and their families of the risks and benefits of the procedure.
d. Interact with hospital staff, peers and attending in a collegial, professional manner.
e. Actively participate in the education of medical student and junior residents.
f. Participate in discussions and resolution of ethical issues that affect patient care.
g. Attend and participate in Departmental and team conferences with an aim to develop their skills in public speaking.

• **Professionalism**

The resident will:

a. Develop a strong work ethic, personal integrity, and commitment to the highest standards of patient care.
b. Demonstrate sensitivity and respect for age, sex, race and culture of patients.
c. Develop a commitment to providing equal health care to all patients.
d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

• **Systems Based Practice**

The resident will:

a. Understand and practice high quality, cost effective patient care.
b. Choose appropriate treatment options for patients based on risk-benefit analysis.
c. Know the roles of the different specialties and services in the institution and how and when to incorporate their services in the care of the patient.
d. Learn the basics of coding for diagnoses and services.
e. Learn how to facilitate patient and bed-flow.

D

**Year 1 Introductory Adult Cardiac Surgery**

Timeframe: 3 months at The Mount Sinai Medical Center in Year 1

The cardiac surgery service performs 1300-1500 major cardiac cases per year, including the full spectrum of adult and pediatric cardiac surgery. The Introductory Adult Cardiac Surgery Rotation is designed to give incoming residents competency in core cardiac surgical clinical and operative skills, with a view to ensuring that they can participate safely in the management of all patients on the service, and have a strong platform from which to build more advanced general thoracic and
cardiac surgical skills. At the completion of the Introductory Adult Cardiac Surgery rotation, the cardiothoracic resident will have obtained the following goals and objectives:

• **Patient Care**

1. The resident should demonstrate basic proficiency in the pre- and post-operative care of cardiothoracic surgical patients in both the in and out-patient setting, and operative management, displaying a practical understanding of:

   a. The management of critically ill cardiothoracic surgical patients in the perioperative period.
   b. The management of a patient undergoing cardiopulmonary bypass.
   c. The management of myocardial protection during cardiac surgery.
   d. The management of a patient requiring circulatory support.
   e. The assessment and management of patients with coronary heart disease, including elective and emergency presentations, to include basic competence in both primary and secondary procedures, and where appropriate to include off pump and on pump strategies and arterial revascularization.
   f. The preliminary assessment and initial management of patients with complications of myocardial infarction, including mitral regurgitation, aneurysm and septal defects, including operative management in appropriate situations.
   g. The assessment and management of patients with valvular heart disease; including both isolated and combined aortic and mitral valve disease.
   h. The assessment and management of patients with combined coronary and valvular heart disease, including operative management.
   i. The preliminary assessment and initial management of patients with acute dissection of the ascending aorta. To include operative management in appropriate situations.
   j. The assessment of patients suitable for endovascular intervention on the thoracic aorta.
   k. The assessment and management of end-stage heart failure, including basic competency in cardiac transplantation, ventricular assist device therapy, revascularization and valvular heart surgery in this setting.
   l. The assessment and management of patients with cardiothoracic trauma.

2. The resident should be able to demonstrate competency in basic cardiothoracic surgical skills including:

   a. Suturing and knot tying with instruments and sutures commonly used in cardiac surgery.
   b. Principles of hemostasis.
   c. Open saphenous vein harvest.
   d. Anterior thoracotomy, median sternotomy.
   e. Aorto-caval cannulation.
   f. Internal mammary artery harvest.
   g. Proximal aorto-coronary anastomosis.
   h. Decannulation.
   i. Sternal closure.

• **Medical Knowledge**

By the end of this rotation residents should be able to demonstrate:

a. Adherence to the Cardiothoracic Surgery Directors Association (TSDA) weekly Requisite Curriculum Readings
b. A detailed understanding of current consensus guideline indications for cardiothoracic surgery and adjuncts including pharmacotherapeutic and percutaneous interventions.
c. A comprehensive knowledge of normal and pathologic conditions of both cardiovascular structures including congenital and acquired lesions (including infections, trauma, tumors, and metabolic disorders) of both the heart and blood vessels in the thorax.


d. Familiarity with diagnostic procedures such as cardiac catheterization, angiography, electrocardiography, echocardiography, and imaging techniques.

• **Practice Based Learning & Improvement**

The resident will:

a. Start a retrospective database clinical outcomes study, with the aim of completing it within 6 to 12 months.

b. Attend and actively participate in department and team conferences where they learn how to critically review the current literature.

c. Actively participate, in retrospective studies to examine practice patterns in the institution.

• **Interpersonal & Communication Skills**

The resident will:

a. Know how to communicate with patients and their families regarding surgical procedures and medical status of the patient.

b. Participate actively in the process of obtaining informed consent.

c. Inform patients and their families of the risks and benefits of the procedure.

d. Interact with hospital staff, peers and attendings in a collegial, professional manner.

e. Actively participate in the education of medical student and junior residents.

f. Participate in discussions and resolution of ethical issues that affect patient care.

g. Attend and participate in Departmental and team conferences with an aim to develop their skills in public speaking.

• **Professionalism**

The resident will:

a. Develop a strong work ethic, personal integrity, and the highest standards of patient care.

b. Demonstrate sensitivity and respect for age, sex, race and culture of patients.

c. Develop a commitment to providing equal health care to all patients.

d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

• **Systems Based Practice**

The resident will:

a. Understand and practice high quality, cost effective patient care.

b. Choose appropriate treatment options for patients based on risk-benefit analysis.

c. Know the roles of the different specialties and services in the institution and how and when to incorporate their services in the care of the patient.

d. Learn the basics of coding for diagnoses and services.

e. Learn how to arrange for elective and emergent surgeries, tests and admissions.
Year 1 Thoracic Surgery Goals and Objectives

Timeframe: 8 months in Year 1 on the Thoracic Surgery Services at The Mount Sinai Medical Center

The Thoracic Surgery Services at The Mount Sinai Hospital covers the full spectrum of lung, mediastinal, and upper gastrointestinal surgery. Over 600 major thoracic procedures were performed last year and all our residents have met their ABTS case requirements early during their thoracic rotations. There is a faculty of 5 thoracic surgeons and the department is currently recruiting a new Chief of Thoracic Surgery with the aim of further increasing case-mix and volume.

During this introductory 8 month rotation the cardiothoracic resident will function as the thoracic resident. They may be the sole ACGME resident on the thoracic service during this time, unless the 2nd year ACGME resident is a thoracic track resident and elects to spend their second year in an advanced elective on the service. In this way they will have unrestricted exposure to a wide range of core surgical conditions and procedures, and start to acquire skills required to organize a clinical service.

In order to continue to build on the cardiac surgical experience obtained in the Introductory Cardiac Surgery Rotation, and to maximize the chance to meet board requirements in cardiac cases, residents are actively encouraged to scrub weekly on cardiac cases selected for their teaching potential throughout this year.

- Patient Care
  1. The resident should demonstrate an understanding of the principles of routine and critical care of surgical patients by being able to demonstrate competency in:

     a. Patient selection and determination of suitability for major surgery and the pre and postoperative management of thoracic surgical patients.
     b. Caring for complex critically ill thoracic patients including hemodynamic, respiratory and enteral management.
     c. The assessment and management of lung, and esophageal cancer, including the scientific basis of staging systems and techniques used in the determination of stage and fitness for surgery, and an understanding of the role of surgical treatment in the multidisciplinary management of intrathoracic malignant diseases, including an appreciation of the principles of other treatment modalities and their outcomes.
     d. The assessment and management of patients with pleural disease; including pneumothorax and empyema, and including both VATS and open strategies.
     e. The assessment and management of patients with chest wall abnormalities, infections and tumors.
     f. The assessment and management of patients' disorders of the diaphragm, including trauma to the diaphragm.
     g. The assessment and management of patients with emphysematous and bullous lung disease; including surgical management if appropriate and utilizing both VATS and open strategies.
     h. The assessment and management of patients with disorders of the esophagus; including surgical management if appropriate and utilizing both VATS and open strategies.
     i. The assessment and management of patients with disorders of the stomach; including surgical management if appropriate and utilizing both VATS and open strategies.
j. The assessment and management of patients with disorders of the pericardium and pericardial cavity; including surgical management if appropriate and utilizing both VATS and open strategies.

k. The assessment and management of patients with mediastinal tumors and masses; including surgical management if appropriate and utilizing both VATS and open strategies.

l. The assessment and management of patients with disorders of the major airways, including operative management in suitable cases.

2. The resident will develop core skills in thoracic surgery by the end of the rotation, demonstrating:

   a. Basic competency in surgery for benign and malignant conditions of the lungs, including performing uncomplicated lobectomy for lung cancer, wedge resection and metastasectomy under supervision.
   b. Intraoperative diagnosis and staging.
   c. Open operation for uncomplicated pleural problems e.g. pneumothorax, effusion, haemothorax including drainage, biopsy, pleurodesis and pleurectomy.
   d. Esophagoscopy and gastroscopy.
   e. Bowel anastomotic techniques.
   f. VATS procedures for uncomplicated pleural problems e.g. pneumothorax, effusion, hemithorax including drainage, biopsy, pleurodesis and pleurectomy.
   g. Open and VATS procedures for empyema, including techniques for decortication.
   h. Competency in performing appropriate thoracic incisions and laparotomy.
   i. Proficiency in the assessment and management of a patient by bronchoscopy and esophagoscopy including foreign body retrieval.

• Medical Knowledge

By the end of this rotation the resident should be able to demonstrate:

   a. In depth knowledge of the Thoracic Surgery Directors Association (TSDA) weekly Requisite Curriculum Readings.
   b. Progressively acquire, under supervision, the operative skills to perform the full spectrum of general thoracic surgical procedures including endoscopy, thoracoscopic and open procedures of the lungs, pleura, chest wall, esophagus, mediastinum and diaphragm.
   c. A detailed understanding of current consensus guideline indications for thoracic surgery and adjuncts including pharmacotherapeutic and adjuvant oncological interventions.
   d. A solid knowledge base of the fundamental pathophysiologic and clinical processes underlying the diseases of the non-cardiovascular, thoracic organs, and upper gastrointestinal tract.
   e. A comprehensive knowledge of normal and pathologic conditions of both thoracic and gastrointestinal structures including congenital and acquired lesions (including infections, trauma, tumors, and metabolic disorders) of both the heart and blood vessels in the thorax, as well as diseases involving the lungs, pleura, chest wall, mediastinum, esophagus, stomach and diaphragm.
   f. A detailed understanding of diagnostic modalities in this field including conventional radiography, CT and MR scans, PET scans, ultrasonography, esophageal manometry and pH testing, pulmonary function tests, etc.
   g. A comprehensive understanding of the selection and timing of operative intervention in thoracic disease focusing on an evidence-based approach using the most current literature.
   h. A thorough understanding of the preoperative management of patients undergoing general thoracic surgical procedures such as optimization of cardiopulmonary status, oncologic staging, neoadjuvant therapy, etc.
i. Detailed knowledge of the physiologic basis of the spectrum of general thoracic surgical procedures.

j. A thorough understanding of the assessment and management of a patient by mediastinal exploration.

k. Understand the principles of post-operative care of patients undergoing general thoracic procedures including management of drains, post-operative imaging, oncologic surveillance, adjuvant therapy, etc. and management of post-operative complications.

• **Practice Based Learning & Improvement**

  The resident will:

  a. Maintain an up-to-date and accurate logbook of procedures and outcomes.
  b. Conduct a publishable retrospective database analysis of thoracic surgical outcomes under supervision.
  c. Attend and actively participate in department and team conferences where they learn how to critically review the current literature.

• **Interpersonal & Communication Skills**

  The resident will:

  a. Know how to communicate with patients and their families regarding surgical procedures and medical status of the patient.
  b. Participate actively in the process of obtaining informed consent.
  c. Inform patients and their families of the risks and benefits of the procedure.
  d. Interact with hospital staff, peers and attending in a collegial, professional manner.
  e. Actively participate in the education of medical student and junior residents.
  f. Participate in discussions and resolution of ethical issues that affect patient care.
  g. Attend and participate in Departmental and team conferences with an aim to developing their skills in public speaking.

• **Professionalism**

  The resident will:

  a. Develop a strong work ethic, personal integrity, and commitment to the highest standards of patient care.
  b. Demonstrate sensitivity and respect for age, sex, race and culture of patients.
  c. Develop a commitment to providing equal health care to all patients.
  d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

• **Systems Based Practice**

  The resident will:

  a. Understand and practice high quality, cost effective patient care.
  b. Choose appropriate treatment options for patients based on risk-benefit analysis.
  c. Know the roles of the different specialties and services in the institution and how and when to incorporate their services in the care of the patient.
  d. Learn the basics of coding for diagnoses and services.
  e. Learn how to arrange for elective and emergent surgeries, tests and admissions.
**Year 2**

Year 2 is either spent as 12 months in adult and congenital cardiac surgery, or general thoracic surgery, depending on whether the resident is primarily interested in independent practice as a cardiac or general thoracic surgeon. Within these two areas there is ample opportunity to consolidate the skills gained in the first year rotations, and to develop more specialist skills.

**Year 2 Cardiac Surgery**

Timeframe: 12 continuous months at The Mount Sinai Medical Center in the second year

The Intermediate The Year 2 Cardiac Surgery rotation is designed to allow residents to consolidate their skills in adult cardiac surgery, and cardiothoracic surgery intensive care, eventually developing proficiency in key adult cardiac operations, as well as clinical leadership skills. Residents spend 12 months in adult cardiac surgery, moving through three firms currently organized as general cardiac surgery, aortic surgery and mitral surgery. The resident will be involved throughout his year in congenital cardiac surgery, transplants and ventricular assist device procedures. The second year resident serves as the Chief Resident and runs the adult cardiac surgery service and participates in the intra- and post-operative care of patients on pediatric cardiac surgery services in collaboration with other members of that team including pediatric cardiology fellows and attendings.

At the completion of the Year 2 Cardiac Surgery rotation the cardiothoracic resident should have developed the interpersonal and professional skills necessary to be a practicing thoracic surgeon particularly outcomes audit, team leadership, and responsibility. The resident should demonstrate proficiency in the pre- and post-operative care of cardiothoracic surgical patients in both the in- and out-patient setting, and in key adult cardiac operations, and will have obtained the following goals and objectives by the end of the rotation:

- **Patient Care**
  
  The resident should demonstrate proficiency in the pre- and post-operative care of cardiothoracic surgical patients in both the in- and out-patient setting, and operative management. As Chief Resident the fifth year resident is responsible for running the adult cardiac surgery service and overseeing administrative issues involving all fellows and residents. The Chief Resident works closely with Dr. Adams, Chairman of the Department of Cardiothoracic Surgery and other members of the faculty to assure the service provide the highest level of care to all patients, with the following responsibilities:

  a. Rounding on all patients on the adult cardiac surgery service - with primary responsibility for supervising the surgical care of the patients on the step-down unit.
  b. Formulating a care plan for each patient with the attending surgeon and if appropriate with other physicians and consultants involved in the patient's care. The resident has primary responsibility for all patient care decisions but works under the direct supervision of the attending surgeon.
  c. Assisting in the post-operative care of pediatric cardiac surgical patients.
  d. Reviewing, along with the other residents and fellows, preoperative patients (including imaging studies, functional tests, etc.) with the attending surgeon and together develop a pre- and intra-operative plan.
  e. Performing adult cardiac surgical consults under the supervision of the attending surgeon.
  f. Managing independently pre- and post surgical patients on the critical care, high dependency and post operative floors. To work as part of a multi-professional, multidisciplinary team in the management of a patient requiring complex critical care.
Competence in the management of uncomplicated situations should be achieved during this period. Management of complicated or difficult situations will require appropriate supervision and guidance.

g. Managing with supervision the clinical and technical aspects of cardiopulmonary bypass.
h. Managing with supervision the clinical and technical aspects of intraoperative myocardial protection.
i. Managing with supervision the clinical and technical aspects of circulatory support.
j. Evaluating and managing with appropriate supervision the surgical aspects of a patient with ischemic heart disease including the complications of ischemic heart disease; patients with valvular heart disease including aortovascular disease; and patients with thoracic trauma.

Proficiency in the assessment and management of the preoperative, postoperative and critically ill patient

k. Advanced analysis and interpretation of investigations, including specific diagnostic tests.
l. Critical care management including recognition, evaluation and treatment of hemodynamic and ventilatory abnormalities.
m. Competency in the supervised management of multi-organ failure.
n. The management of chest trauma (ATLS).

2. The resident should be able to demonstrate proficiency in cardiothoracic surgical skills including:

a. Progressively acquire, under supervision, the operative skills to link the individual stages of common adult cardiac surgical procedures together so that the resident is performing basic cardiac operations as first surgeon.
b. Cannulation and institution of cardiopulmonary bypass, including bi-caval and axillary cannulation.
c. Weaning from bypass and decannulation.
d. Hemostasis including in reoperative patients.
e. Femoral cannulation and decannulation.
f. Mammary/radial artery harvest.
g. Preparation for, and management of, cardiopulmonary bypass.
h. Proximal aortovenous and distal coronary anastomosis.
i. Heart valve replacement.
j. Surgical re-exploration for bleeding or tamponade.
k. Basic catheter and guide wire OR endoscopic skills.
l. Primary coronary artery bypass grafting.
m. Aortic valve replacement.
n. Mitral valve replacement.
o. Tricuspid valve repair.
p. Atrial septal defect closure.
q. Coarctation resection.

• Medical Knowledge

By the end of this rotation residents should be able to demonstrate their ability to:

a. Acquire a comprehensive knowledge base of the fundamental pathophysiologic and clinical processes in adult and pediatric patients with cardiovascular disease.
b. Learn to review and interpret the specialist diagnostic modalities in this field including echocardiography, cardiac catheterization, nuclear imaging, CT and MR scans, etc.
c. Understand the selection and timing of operative intervention in adult and pediatric cardiovascular disease focusing on an evidence-based approach using the most current literature.
d. Develop a comprehensive knowledge base of the pathophysiologic and clinical processes in patients with complex adult cardiovascular diseases including thoracic aortic disease, end-stage heart failure and complex coronary and valvular disease.
e. Develop a detailed, expert understanding of the selection and timing of operative intervention in complex adult cardiovascular disease focusing on an evidence-based approach using the most current literature.

f. Specifically learn the processes for selection of patients and organs in thoracic transplantation and mechanical assistance.

g. Understand the preoperative management of patients undergoing cardiovascular procedures such as optimization of heart failure patients and risk-stratification.

h. Understand the physiologic basis of the spectrum of adult and pediatric cardiovascular procedures including principles and practice of cardiopulmonary bypass.

i. Understand the pathophysiology, diagnosis and management complications of cardiac surgery including mediastinal bleeding, mediastinitis, sepsis, stroke, renal failure, gastrointestinal bleeding and ischemia, arrhythmias, respiratory failure.

j. Consolidate detailed knowledge of the clinical features and advanced operative and medical management of the following commonly occurring cardiothoracic conditions:

1. coronary artery disease
2. valvular heart disease
3. aortovascular disease
4. end stage heart failure
5. principles and consequences of cardiopulmonary bypass, myocardial protection and circulatory support

**Practice Based Learning & Improvement**

The resident will:

a. Display an in depth understanding of critical appraisal of the literature, and principles of study design, data analysis and scientific writing.

b. Organize the clinical material and present at weekly multidisciplinary thoracic clinical conference and morbidity and mortality conference.

c. Learn to utilize a variety of educational resources to examine and improve their patient care practices based on scientific evidence.

d. Attend and actively participate in department and team conferences where they learn how to critically review the current literature.

e. Actively participate, as feasible, in retrospective studies to examine practice patterns in the institution.

**Interpersonal & Communication Skills**

The resident will:

a. Know how to communicate with patients and their families regarding surgical procedures and medical status of the patient.

b. Participate actively in the process of obtaining informed consent.

c. Inform patients and their families of the risks and benefits of the procedure.

d. Interact with hospital staff, peers and attending in a collegial, professional manner.

e. Actively participate in the education of medical students and junior residents.

f. Participate in discussions and resolution of ethical issues that affect patient care.

g. Attend and participate in Departmental and team conferences with an aim to develop their skills in public speaking.

**Professionalism**

The resident will:

a. Develop a strong work ethic, personal integrity, and commitment to the highest standards of patient care.

b. Demonstrate sensitivity and respect for age, sex, race and culture of patients.
c. Develop a commitment to providing equal health care to all patients.
d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

• **Systems Based Practice**

The resident will:

a. Understand and practice high quality, cost effective patient care.
b. Choose appropriate treatment options for patients based on risk-benefit analysis.
c. Know the roles of the different specialties and services in the institution and how and when to incorporate their services in the care of the patient.
d. Learn the basics of coding for diagnoses and services.
e. Learn how to arrange for elective and emergent surgeries, tests and admissions.

**Year 2 Congenital Cardiac Surgery**

Timeframe: continuous exposure during Year 2 adult cardiac surgery

The Congenital Cardiac Surgery curriculum is designed to provide comprehensive education and training in the principles and practice of congenital cardiac surgery, while consolidating the clinical and operative cardiac surgical skills gained in the Year 2 Cardiac Surgery rotation. At the completion of the Congenital Cardiac Surgery curriculum, the cardiothoracic resident will have obtained the following goals and objectives:

• **Patient Care**

1. The resident should demonstrate proficiency in the pre- and postoperative care of congenital surgical patients in both the in- and out-patient setting, and operative management including:

   a. Working as a member of a multi-disciplinary team in the perioperative management of complex congenital cardiac surgical patients.
   b. Initial assessment and management of common problems in the acute post-operative setting after congenital cardiac surgery including bleeding, tamponade, and low cardiac output.

2. The resident should be able to demonstrate proficiency in cardiothoracic surgical skills including:

   a. Sternotomy and thoracotomy approaches, and incision closure in pediatric patients.
   b. Resternotomy and rethoracotomy in adult congenital cardiac surgical patients.
   c. Cannulation for cardiopulmonary bypass in pediatric patients.
   d. Patent ductus arteriosus, coarctation repair, atrial and ventricular septal defect repair as primary surgeon under supervision.
• **Medical Knowledge**

Residents should be able to demonstrate:

a. A detailed understanding of current consensus guideline indications for congenital cardiac surgery and adjuncts including pharmacotherapeutic and percutaneous interventions.
b. A comprehensive knowledge of normal and pathologic conditions of both cardiovascular structures including congenital and acquired lesions.
c. In addition, the ability to establish a precise diagnosis, an essential step toward proper therapy, requires familiarity with diagnostic procedures such as cardiac catheterization, angiography, electrocardiography, echocardiography, and imaging techniques.

• **Practice Based Learning & Improvement**

The resident will:

a. Learn to utilize a variety of educational resources to examine and improve their patient care practices based on scientific evidence.
b. Attend and actively participate in department and team conferences where they learn how to critically review the current literature.
c. Actively participate, as feasible, in retrospective studies to examine practice patterns in the institution.

• **Interpersonal & Communication Skills**

The resident will:

a. Know how to communicate with pediatric patients and their families regarding surgical procedures and medical status of the patient.
b. Participate actively in the process of obtaining informed consent.
c. Inform patients and their families of the risks and benefits of the procedure.
d. Interact with hospital staff, peers and attending in a collegial, professional manner.
e. Actively participates in the education of medical students and junior residents.
f. Participate in discussions and resolution of ethical issues that affect patient care.
g. Attend and participate in Departmental and team conferences with an aim to develop their skills in public speaking.

• **Professionalism**

The resident will:

a. Develop a strong work ethic, personal integrity, and commitment to the highest standards of patient care.
b. Demonstrate sensitivity and respect for age, sex, race and culture of patients.
c. Develop a commitment to providing equal healthcare to all patients.
d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.

• **Systems Based Practice**

The resident will:
Year 2 General Thoracic Surgery

Time frame: Twelve months in the final year at Mount Sinai Hospital

Year 2 General Thoracic Surgery is designed to enable thoracic track residents to develop proficiency in general thoracic surgery. As Chief Resident the second year resident is responsible for running the cardiothoracic service and overseeing administrative issues involving all fellows and residents. The Chief Resident works closely with Dr. Adams, Chairman of the Department of Cardiothoracic Surgery and other members of the faculty to assure the service provide the highest level of care to all patients, with the following responsibilities:

• **Patient Care**

As Chief Resident the second year resident is responsible for running the thoracic surgery service and overseeing administrative issues involving all thoracic fellows and residents. The Chief Resident works closely with the Chief of Thoracic Surgery and other members of the faculty to assure the service provides the highest level of care to all patients. By the end of this rotation the chief resident will have achieved the following goals and objectives:

a. Proficiency in the preoperative assessment, operative management and post-operative care of patients undergoing general thoracic surgical procedures; including optimization of cardiopulmonary status, oncologic staging, neoadjuvant therapy, and operative techniques.

b. Progressively acquire, under supervision, the operative skills to perform the complex aspects of thoracic surgery including esophageal resection, re-operative pulmonary resection and video-assisted major thoracic procedures.

• **Medical Knowledge**

The chief thoracic resident will:

a. Acquire a detailed knowledge of the fundamental pathophysiologic and clinical processes underlying the diseases of the non-cardiovascular, thoracic organs and the physiologic basis of the spectrum of general thoracic surgical procedures.

b. Gain proficiency in interpretation of the various diagnostic modalities in this field including conventional radiography, CT and MR scans, PET scans, ultrasonography, esophageal manometry and pH testing, pulmonary function tests, etc.

c. Provide selection and timing of operative intervention in thoracic disease focusing on an evidence-based approach using the most current literature.

d. Acquire a detailed knowledge of their chosen subspecialty area.

• **Practice Based Learning & Improvement**

The chief thoracic resident will:

a. Initiate, design and complete clinical studies either from the thoracic surgery database or from prospective data.
b. Learn to utilize a variety of educational resources to examine and improve their patient care practices based on scientific evidence.

\[\text{c. Attend and actively participate in department and team conferences where they learn how to critically review the current literature.}\]

**Interpersonal & Communication Skills**

The chief thoracic resident will:

\[\begin{align*}
\text{a. Know how to communicate with patients and their families regarding surgical procedures and medical status of the patient.} \\
\text{b. Participate actively in the process of obtaining informed consent.} \\
\text{c. Inform patients and their families of the risks and benefits of the procedure.} \\
\text{d. Interact with hospital staff, peers and attending in a collegial, professional manner.} \\
\text{e. Actively participate in the education of medical student and junior residents.} \\
\text{f. Participate in discussions and resolution of ethical issues that affect patient care.} \\
\text{g. Attend and participate in Departmental and team conferences with an aim to develop their skills in public speaking.}
\end{align*}\]

**Professionalism**

The chief thoracic resident will:

\[\begin{align*}
\text{a. Develop a strong work ethic, personal integrity, and commitment to the highest standards of patient care.} \\
\text{b. Demonstrate sensitivity and respect for age, sex, race and culture of patients.} \\
\text{c. Develop a commitment to providing equal health care to all patients.} \\
\text{d. Maintain a professional atmosphere in their relationship with their peers, medical students and other associates.}
\end{align*}\]

**Systems Based Practice**

The chief thoracic resident will:

\[\begin{align*}
\text{a. Optimize career opportunities by interfacing with referring physicians, networking, and gaining understanding of practice building and management.} \\
\text{b. Understand and practice high quality, cost effective patient care.} \\
\text{c. Choose appropriate treatment options for patients based on risk-benefit analysis.} \\
\text{d. Know the roles of the different specialties and services in the institution and how and when to incorporate their services in the care of the patient.}
\end{align*}\]