# CORE COMPETENCY GOALS AND OBJECTIVES OF THE CONGENITAL CARDIOTHORACIC SURGERY ROTATION AT CHRIST HOSPITAL

# PGY6

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

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

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

EVALUATION

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

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

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

EVALUATION INSTRUMENTS

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

* Faculty evaluation of Resident
* Resident evaluation of Faculty
* Resident evaluation of rotation
* Resident evaluation of program
* Daily feedback from faculty to resident
* Didactic lectures
* Patient care settings
	+ Operating room
	+ Intensive care unit
	+ General care wards
	+ Outpatient clinics
	+ Other
* Non-patient care settings

OTHER COMMENTS / RESPONSIBILITIES

The Congenital Cardiothoracic Surgery practice headquartered at Christ Hospital is a multi-surgeon, multi-hospital practice. As such, the rotation has been designed around operative experience, post-operative care, and multi-disciplinary conference-based patient evaluation. There is no single scheduled clinic day. As such, it is up to the individual resident to demonstrate initiative to follow specific patients pre- and postoperatively as outpatients to gain a longitudinal perspective on their care. Daily rounds and patient care responsibilities will include a sign-out to ICU staff highlighting intra-operative details and their impact on the post-operative care plan. Residents are expected to stay at the fresh post-operative bedside until reasonable stability is achieved.

As this rotation is off-site, attendance at regular Loyola Departmental conferences is not expected.The resident is required to keep up with the weekly TSDA curriculum conference, and complete the associated on-line quizzes. Our residents are required to participate in

* Weekly Pediatric Cardiology/Pediatric Cardiothoracic Surgery Conference
* Weekly Pediatric Cardiology Fellow’s Conference
* Such didactic activities as each service attending may individually schedule

GOALS AND OBJECTIVES ORGANIZED BY CORE COMPETENCY

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

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

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

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

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

**CONGENITAL HEART DISEASE**

**Anatomy and History**

*Learner Objectives:* Upon completion of the unit the resident will be able to:

* Describe the embryology and anatomy of the normal heart;
* Discuss the history of congenital cardiac surgery, and the intellectual development of operations used to manage each cardiac anomaly.
* Discuss 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.

**Physiology and Physiologic Evaluation**

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

* Describes normal fetal circulation;
* Describes the transitional nature of circulation as the fetus becomes a neonate;
* Discusses 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;
* Applies 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.

**Cardiopulmonary Bypass for Operations on Congenital Cardiac Anomalies**

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

* Identifies arterial and venous cannulation techniques for different intracardiac defects;
* Summarizes the indications for the various techniques of bypass (anatomy, pathophysiology, and technical requirements of the underlying cardiac defects);
* Comprehends the techniques of myocardial protection in the neonate and young infant;
* Describes the use of varying levels of hemodilution and anticoagulation;
* Discusses perfusion flow and pressure control;
* Identifies 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:

* Carries out arterial and venous cannulation and initiates cardiopulmonary bypass;
* Contributes in the repair of congenital heart defects using cardiopulmonary bypass.
* Executes arterial and venous cannulation and initiates cardiopulmonary bypass;
* Oversees the perfusionist in the intraoperative management and conduct of cardiopulmonary bypass;

**Left-To-Right Shunts**

*Learner Objectives:* Upon completion of the unit the resident is able to:

* Identify the anatomy, embryology, and physiology of the most common or important anomalies;
* Discuss the operative indications of the most common or important anomalies;
* Describe the technical components of the operative repair of the most common or important anomalies;
* Comprehends the postoperative care of each anomaly.

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

* Demonstrates the preoperative evaluation of patients with each of these anomalies;
* Participates in the operative repair of ventricular septal defects;
* Repairs more complex cardiac anomalies;
* Executes the preoperative evaluation of patients with each of these anomalies.
* Manages postoperative care

**Cyanotic Anomalies**

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

* Describes the anatomy and physiology of each anomaly;
* Recites the methods of diagnosis;
* Assumes the role of medical management and interventional cardiology as treatment options;
* Discerns the indications for and timing of operation;
* Comprehends the technical components of operative repair;
* Recognizes the postoperative care, expected outcome, long-term results, and complications.

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

* Does major palliative operations for these congenital cardiac anomalies;
* Does preoperative evaluation and preparation;
* Manages postoperative care.
* Does operative repair of tetralogy, TGA, Truncus arteriosus, TAPVR, Ebstein's anomaly, and Fontan-type operations.

**Obstructive Anomalies**

*Unit Goal:* At the end of this unit the resident comprehends 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 takes part in the operative and non-operative treatment.

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

* Defines the anatomy and physiology of each anomaly;
* Recites the methods of diagnosis;
* Describes the role of medical management and interventional cardiology;
* Discusses the principles of postoperative care;
* Summarizes the technical components of operative repair;
* Explains the expected outcome, long-term results and complications.

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

* Demonstrates corrections for patent ductus arteriosus and coarctation of the aorta;
* Demonstrates preoperative evaluation and preparation;
* Manages postoperative care;
* Uses prostaglandins in the management of patients with neonatal coarctation, interrupted aortic arch, critical aortic stenosis.
* Demonstrates surgical ability with aortic valvotomy, repair of supravalvular and subvalvular aortic stenosis, pulmonary valvotomy, correction of subvalvular pulmonary stenosis, correction of vascular rings.
* Does operations for left ventricular outflow obstruction and interrupted aortic arch.

**CONGENITAL CHEST WALL**

**Congenital Abnormalities and Thoracic Outlet Syndrome**

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

* Recognizes pectus excavatum and pectus carinatum, describes possible physiologic disturbances, and interprets diagnostic tests to identify such physiologic disturbances;
* Recognizes the indications for the operative treatment of congenital chest wall abnormalities;
* Defines the complications of reconstruction of congenital chest wall abnormalities and their management;
* Describes the etiology, evaluation, differential diagnosis, and diagnostic criteria for thoracic outlet syndrome;
* Discusses the operative and non-operative management of thoracic outlet syndrome.

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

* Recognizes the varied presentations of thoracic outlet syndrome and interprets diagnostic tests;
* Reads and interprets diagnostic x-ray and applies physiologic examinations for congenital chest wall defects and thoracic outlet syndromes;
* Evaluates and treats patients with congenital chest wall malformations;
* Takes part in the operative reconstruction of selected chest wall defects;
* Executes first rib and cervical rib resection and repairs or releases vascular and neural abnormalities associated with thoracic outlet syndrome;

**CONGENITAL LUNGS AND PLEURA**

**Congenital Lung Disease**

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

* Recognizes various congenital lung abnormalities and describes their anatomy and indications for treatment

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

* Evaluates patients with congenital lung abnormalities;
* Executes operations for congenital lung abnormalities and their complications.

**CONGENITAL ESOPHAGUS**

**Congenital Abnormalities**

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

* Recognizes the clinical presentations, types, diagnosis and treatment of esophageal atresia and congenital tracheo-esophageal fistula;
* Appreciates 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;
* Completes diagnostic tests of congenital esophageal diseases;
* Assists in the operative repair of tracheo-esophageal fistula;
* Contributes to the operative management of esophageal duplication cysts.

**CONGENITAL MEDIASTINUM**

**Congenital Abnormalities of the Mediastinum**

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

* Is able to diagnose mediastinal cysts;
* Recognizes the symptoms associated with mediastinal abnormalities.

*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;
* Diagnoses and manages patients with congenital abnormalities of the mediastinum.

**CONGENITAL DIAPHRAGM**

**Congenital Abnormalities**

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

* Describes the anatomy of congenital diaphragmatic hernias;
* Discusses the physiologic consequences of diaphragmatic hernias;
* Recognizes the indications for operative repair of diaphragmatic hernias;
* Diagnoses and manages infants and adults with diaphragmatic hernias.

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

* Evaluates neonates with congenital diaphragmatic hernias;
* Assists in the operative treatment of infants with diaphragmatic hernias;
* Contributes in the preoperative and postoperative management of multisystem abnormalities of infants with congenital diaphragmatic hernias;
* Completes operative treatment of adults with delayed presentation of diaphragmatic hernias;
* Manages eventration of the diaphragm in children and adults.

**Miscellaneous Anomalies**

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

* Describes 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.
* Discusses 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:

* Does 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;
* Evaluates angiocardiograms, echocardiograms, and cardiac catheterizations of the above anomalies;
* Develops treatment plans for the above anomalies;
* Assists in operative treatment for the above anomalies;
* Manages postoperative care for the above anomalies.
* Develops treatment plans for the above anomalies;
* Assists in operative treatment for the above anomalies.

**Principles of Postoperative Care**

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

* Identifies the physiologic characteristics of neonates and small infants;
* Describes the management of infants and children who have undergone operative correction of simple and complex congenital cardiac anomalies;
* Comprehends the postoperative management of patients with systemic-to-pulmonary artery shunts;
* Defines the management of patients who have had a right heart bypass operation;
* Discusses the physiologic preoperative and postoperative management of patients with hypoplastic left heart syndrome;
* Describes which infants and children are prone to have a pulmonary hypertensive crisis;
* Defines the prevention, recognition, and treatment of pulmonary hypertensive crises.

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

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

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

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

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

The resident is expected to:

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

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

The resident is expected to:

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

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

The resident is expected to:

* Complete weekly TSDA reading/viewing assignments, and read such extra sources as may be assigned for clinical conferences or to address deficiencies.

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

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

The resident is expected to:

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

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

The resident is expected to:

* Discuss alternative treatment strategies with an attending prior to a procedure, supporting decision making with relevant literature
* Read published material and listen to presentations critically;
* Demonstrate competence by:
	+ Defining an analyzable problem or scientific question
	+ Assembling an appropriate literature review
	+ Synthesizing and analyzing available data
	+ Formulating an informed and insightful discussion
	+ Composing a properly constructed, critically reviewed bibliography or list of literature citations
* Show an understanding of the appropriate application of statistical tests to the problem;
* Demonstrate an understanding of the appropriate application of other commonly used statistical tests such as univariate analysis, multivariate analysis, analysis of variance, and the use of T-tests for paired data and multiple comparisons. (Residents should know the limitations, deficiencies and proper applications of these commonly used statistical tests);
	+ •Show evidence of ability to critically analyze major clinical research papers in the thoracic literature which guide practice;
* •Apply knowledge of the scientific method to design and execute at least one formal analysis to solve a problem related to thoracic surgery.

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

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

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

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

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

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

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

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

The resident is expected to:

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

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

The resident is expected to:

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

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

The resident is expected to:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

The Resident is expected to:

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

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