# CORE COMPETENCY GOALS AND OBJECTIVES OF THE ADULT CARDIOVASCULAR SURGERY ROTATION AT LOYOLA UNIVERSITY MEDICAL CENTER

# PGY 6/7

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 verbaland immediate. Faculty will evaluate the Thoracic Surgery Residents based upon stated objectives as part of the ACGME core competencies. These portions of the curriculum will be viewed as “Medical Knowledge” and “Patient Care [e.g. operative skills, and perioperative management, etc.].

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

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

EVALUATION INSTRUMENTS

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

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

OTHER COMMENTS / RESPONSIBILITIES

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

Our residents are required to participate in

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

Residents are required to attend the Outpatient Clinic for their respective service at least one day per week.

GOALS AND OBJECTIVES ORGANIZED BY CORE COMPETENCY

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

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

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

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

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

**ACQUIRED HEART DISEASE**

**Coronary Artery Disease**

*Unit Goal:* At the end of this unit the resident will be able to discuss the physiology of coronary circulation, the pathophysiologic causes and derangement of ischemic heart disease and the sequelae of coronary events, and executes comprehensive short and long Term management.

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

* Will be able to identify the physiology of coronary circulation and the physiologic derangements caused by stenosis and obstruction;
* Is able to discuss the risks and complications of coronary artery bypass operations, coronary angiography, and percutaneous coronary artery balloon angioplasty;
* Recognizes the preoperative and postoperative care of patients undergoing coronary artery bypass grafting;
* Can discuss the development of atherosclerotic plaques and the current theories of plaque origination;
* Identifies the normal and variant anatomy of coronary circulation as well as the radiographic anatomy of the coronary arteries and the left and right ventricles;
* Can describe outcomes of angioplasty and of operative and non-operative treatment of coronary artery disease, using statistical methods.

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

* 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;
* Evaluates operative and non-operative management of patients with ischemic heart disease, including coronary artery bypass grafting using the internal mammary artery;
* Directs the critical care management of preoperative and postoperative patients with ischemic heart disease;
* Participates in the performance and evaluation of exercise tolerance tests, echocardiograms, and cardiac catheterizations.

**Abnormalities of the Aorta**

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

* Recognizes the potential morbidity and mortality associated with aortic aneurysms and develops appropriate treatment plans for their management;
* Is able to recall the etiology and the physiology of aortic dissections and all aneurysms involving the ascending, transverse, descending, and abdominal aorta;
* Can describe the operative and non-operative 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;
* Demonstrates preoperative and postoperative care of patients with aneurysms, dissections, and occlusive disease of the aorta.
* Participates in or executes 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.

**Cardiac Arrhythmias**

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

* Will be able to cite the etiology of cardiac arrhythmias and underlying physiologic disturbances

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

* Prepares the operative and non-operative management of patients with atrial arrhythmias;
* Participates in operative management of patients with ventricular arrhythmias, including placement of automatic implantable cardioverter-defibrillator;
* Participates in electrophysiologic studies.

**Valvular Heart Disease**

*Unit Goals:* At the end of this unit, the resident recognizes the normal and pathologic anatomy of the cardiac valves, can discuss their natural history, physiology and clinical assessment, and executes operative and non-operative treatment.

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

* Can discuss the normal and pathologic anatomy of the atrioventricular and semilunar valves;
* Recognizes the natural history, pathophysiology, and clinical presentation of each major valvular lesion (mitral stenosis and incompetence, aortic stenosis and incompetence, tricuspid stenosis and incompetence);
* Recognizes the preoperative and postoperative management of patients with valvular heart disease.
* Can manage the operative and non-operative therapeutic options for the treatment of each major valvular lesion;
* Differentiates the techniques for repair and replacement of cardiac valves.

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

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

**Acquired Heart Disease**

*Clinical Skills:* Residents will be instructed as to the details of conduit harvesting including greater saphenous vein, lesser saphenous vein, internal mammary, radial, encephalic vein harvesting.

The abnormalities of the aorta

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

* Recognizes the potential morbidity and mortality associated with aortic pathology and develops appropriate treatment plans for their management.
* Differentiates the etiology and the physiology of aortic dissections and all aneurysms along the ascending, transverse, arch, descending and abdominal aorta.
* The resident can discuss the operative and non-operative management of patients with acute and chronic aortic dissections.

*Clinical Skills:* During the training program the resident

* Evaluates and interprets plane radiography, echocardiography, CT scans, MRI and contrast studies for diseases of the aorta.
* Evaluates preoperative and postoperative care of patients with aneurysm, dissections and inclusive diseases of the aorta.
* Participates in operative management of thoracic aortic aneurysms, including the various incisions, circulator arrest management, percutaneous and open cannulation and neuro-protective strategies during circulatory arrest.

**THORACIC TRAUMA**

**Cardiovascular Trauma**

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

* Evaluates patients who have sustained cardiovascular trauma;
* Can discuss the physiology of deceleration injuries to the thoracic aorta;
* Is able to name 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;
* Carries out emergency operations to repair traumatic transactions of the thoracic aorta and provide postoperative management.

**TRANSPLANTATION**

**A. Cardiac Transplantation**

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

* Can discuss the indications for cardiac transplantation;
* Recognizes the signs and symptoms of cardiac rejection and delivers the appropriate management;
* Can discuss the evaluation and management of organ donors;
* Can recite the methods of organ harvest and preservation;
* Is able to describe the management of immunosuppressive therapy in cardiac transplantation;
* Can describe the techniques of cardiac transplantation;
* Is familiar with the techniques and complications of endomyocardial biopsy.

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

* Manages organ donors;
* Assists in organ harvest and preservation;
* Evaluates transplant recipients for signs of rejection or infection and initiates appropriate therapy;
* Contributes in cardiac transplantation;
* Manages the cardiac transplant recipient preoperatively and postoperatively;
* Takes part in the immunosuppressive therapy for cardiac transplantation.

**Heart-Lung Transplantation**

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

* Manages the evaluation and management of heart-lung donors;
* Can describe the methods for harvesting and preserving heart-lung blocs;
* Can discuss the indications for heart-lung transplantation;
* Assists in 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 can cite 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:

* Contributes in the evaluation and management of donors for cardiopulmonary transplantation;
* Contributes in heart-lung bloc harvesting and preservation;
* Manages transplant recipients preoperatively and postoperatively;
* Participates in immunosuppressive therapy for transplantation;
* Evaluates transplant recipients for signs of pulmonary rejection and infection, and of cardiac dysfunction.

**EXTRACORPOREAL BYPASS AND COAGULATION - BLOOD PRODUCTS**

**Physiology of Extracorporeal Bypass**

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

* Describes the physiology and mechanics of membrane and bubble oxygenators;
* Discusses the mechanics and operation of roller and vortex pumps;
* Can recite the physiology of various extracorporeal bypass circuits and the derangements caused by their use;
* Can describe the coagulation system and alterations of blood elements;
* Demonstrates the basic design and function of ventricular support devices.

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

* Uses knowledge of the effects of extracorporeal bypass to ensure its safe use;
* Recognizes the correct and incorrect set-up and operation of an extracorporeal circuit;
* Plans and uses extracorporeal circuits in clinical practice;
* Treats physiologic derangements caused by blood-artificial surface interaction;
* Plans and uses ventricular support devices in clinical practice.

**Techniques of Extracorporeal Bypass**

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

* Can discuss the standard techniques for extracorporeal bypass;
* Is able to describe the techniques of cannulation for extracorporeal bypass;
* Oversee the management of patients undergoing extracorporeal bypass.
* Discusses 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:

* Takes part in cannulation for extracorporeal bypass using appropriate access routes;
* Uses appropriate types of extracorporeal bypass to solve specific clinical problems;

**Mechanical Support**

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

* Can describe the indications for cardiac support with mechanical devices or ECMO;
* Discusses alternatives to mechanical support (e.g., intra-aortic and intrapulmonary balloon pumping);
* Identifies the principles of weaning patients from these devices;
* Describes the techniques for inserting these ventricular support devices;
* Recognizes complications of the devices;
* Associate the use of mechanical devices as a “bridge” to transplantation;
* Identifies the requirements for anticoagulation and monitoring of blood trauma.

*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.

**Fundamentals of Coagulation Management and Blood Component Therapy**

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

* Explains the major blood groups, the clotting cascade, and the pathophysiology of clotting (e.g., abnormal clotting, activation of compliment, Kallikrein, prostanoids);
* Explains the specific hemorrhagic and thrombotic complications of cardiac surgery and their management;
* Recalls the methods used in blood component storage and the measures taken to ensure a safe blood supply;
* Recognizes the use of specific blood components to treat abnormalities of red cell quantity and quality, platelet quantity and quality, and coagulation function;
* States the preoperative risk factors for excessive blood loss and blood utilization;
* Can define 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.

**MINOR PROCEDURES**

**Permanent Pacemakers**

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

* Recognizes the indications and contraindications for permanent cardiac pacing;
* Defines the techniques and complications of epicardial and transvenous cardiac pacemakers.

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

* Participates in transvenous and epicardial pacemaker insertion using single and dual chamber pacemakers;
* Participates in transvenous and epicardial pacemaker insertion using single and dual chamber pacemakers;
* Manages complications of pacemakers (e.g., infections, programming problems, lead fractures).

**Tube Thoracostomy**

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

         Discusses the indications and contraindications for tube thoracostomy;

         Recognizes the techniques and complications of tube thoracostomy and their management.

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

         Evaluates patients for tube thoracostomy;

         Demonstrates tube thoracostomy under local, regional and general anesthesia;

         Treats the complications of tube thoracostomy.

**Central Venous Lines and Arterial Lines**

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

         Can recite the indications, contraindications, management and complications of central venous lines and arterial lines.

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

         Is able to manage central venous line insertions by appropriate techniques (e.g., internal jugular vein, subclavian vein, femoral vein);

         Administers arterial line insertions by appropriate techniques (e.g., radial, brachial, femoral and pedal arteries);

         Manages complications of central venous and arterial lines.

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

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

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

The resident is expected to:

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

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

The resident is expected to:

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

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

The resident is expected to:

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

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

The resident is expected to:

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

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

The resident is expected to:

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

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

The resident is expected to:

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

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

The resident is expected to:

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

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

The resident is expected to:

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

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

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

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

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

The resident is expected to:

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

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

The resident is expected to:

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

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

The resident is expected to:

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

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

The resident is expected to:

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

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

The resident is expected to:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

The resident is expected to:

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

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

The Resident is expected to:

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

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

The following documents are used by the Clinical Core Competency Committee to assess progress of residents through the two year program in terms of medical knowledge and technical ability. Per TSDA guidelines, the documents allow measurement discrete enough to describe a resident as being at a certain level, or transitioning between levels.

The milestones listed below are not exhaustive, but are representative. Level 4 achievements in medical knowledge pertaining to lung and esophagus is an indicator of corresponding knowledge regarding mediastinal tumors. Likewise, Level 4 technical ability in Great Vessel is also an indicator of a corresponding skill level sufficient to perform a pulmonary embolectomy.

First year residents on this service are expected to achieve at least level 2 competences in medical knowledge and technical ability as described in the following documents. Second year residents are expected to achieve level 4.

Those who are not projected to reach these levels by the Clinical Core Competency Committee by the end of the appropriate year will receive remediation in the form of one-on-one supervision of reading assignments, simulation labs, and extension of relevant rotation time to address specific deficits.

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