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Introduction

The Tulane University Health Sciences Center has four divisions: the School of Medicine, and School of Public Health and Tropical Medicine, Tulane Medical Center in downtown New Orleans and the Tulane National Primate Research Center in Covington, Louisiana.

Tulane University is a leading private research institution. The university was founded in 1834 as the Medical College of Louisiana in response to the many epidemics that devastated the region’s population. It merged with the public University of Louisiana in 1847 before closing from 1862 to 1865. It reopened beset with financial troubles. These were resolved in the early 1880s by merchant Paul Tulane, who established a fund “for the promotion and encouragement of intellectual, moral and industrial education.” The Louisiana legislature responded to the gift by ceding the University of Louisiana to the fund’s administrators thus creating Tulane University of Louisiana. The Tulane University School of Medicine is one of the oldest and most respected medical schools in the United States. Tulane Medical Center (TMC), opened in 1976, is a seven-story facility, housing outpatient specialty clinics, a 300-bed acute-care hospital and state-of-the-art diagnostic and therapeutic equipment. The Reily Pavilion, an adjacent, four-story building, providing additional clinical and outpatient surgery, was completed in 1991. Tulane Medical Center is a partnership jointly owned by the Hospital Corporation of America (HCA) and Tulane University.

The Tulane University School of Medicine Cardiovascular Diseases Fellowship is a three-year program with rotations through TMC, University Hospital, now called Interim LSU Hospital (ILH) and which is transitioning to the new University Medical Center, Southeast Louisiana Veterans Health Care System in New Orleans (VA) and Tulane Lakeside Hospital for Women and Children, a Metairie hospital & emergency room. The amount of time spent at each institution is determined by the particular needs of the individual trainee and our mission to provide a balanced training experience. The training program includes rotations on the cardiology consultation service, the coronary care unit, the heart station (nuclear cardiology, Holter monitoring, exercise testing, and electrocardiography), the cardiac catheterization laboratory and the echocardiography laboratory. In addition, there will be opportunities for the trainee to participate in basic and/or clinical cardiovascular research. During the program, the trainee will progress from participation in procedures under very close supervision to almost independent activity.

Goal and Mission

The goal of our program is to provide the highest quality training in Cardiovascular Medicine. Our program strives to uphold the Tulane tradition of clinical excellence, teaching and research. We have a strong history of preparing leaders in the field of academic cardiology; providing them with the tools to become skilled clinicians as well as providing outstanding experience in the field of cardiovascular research.

Objectives

This three-year program complies with all ACGME requirements in addition to following the
guidelines and recommendations of the American College of Cardiology (COCATS).

At the end of the training period, Fellows will be equipped with the knowledge, skills and abilities to meet the requirements for certification in cardiovascular diseases, as determined by the Accreditation Council for Graduate Medical Education. These include experience and training in ambulatory medicine, inpatient experience, and special clinical experiences and research. The Fellowship program offers considerable flexibility, and may be tailored to fit individual needs.

Fellows receive training and supervised experience in the evaluation and management of a wide variety of patients with acute and chronic cardiovascular conditions. They will become proficient in all aspects of cardiovascular disease including chronic coronary heart disease, congestive heart failure, arrhythmias, acute myocardial infarction and other acute ischemic syndromes, lipid disorders, hypertension, cardiomyopathy, valvular heart disease, pulmonary heart disease, peripheral vascular disease, infections and inflammatory heart disease, and adult congenital heart disease.

Fellows will develop and demonstrate competence in basic and clinical knowledge, procedural skills, clinical judgment, professionalism and interpersonal skills required as a specialist in cardiovascular diseases. At the completion of the training program, Fellows will have acquired the competency to pass the appropriate specialty boards required to practice as a specialist in the field.

**Curriculum**

**Learning Objectives**

Fellows are exposed to acute and chronic cardiovascular diseases, emphasizing accurate ambulatory and bedside clinical diagnosis, appropriate use of diagnostic studies and integration of all data into a well-communicated consultation, with sensitivity to the individual patient.

The order of clinical rotations is based primarily upon availability and the interests of the Fellow. During this time, under the direct supervision of the attending on each rotation, Fellows will begin to acquire and develop skill in the diagnosis and treatment of cardiovascular disease, demonstrate their ability to gather, synthesize and organize information relating to their patients, as well as demonstrate their understanding of the pathophysiology of cardiovascular disease.

Beginning in the first year and continuing throughout the training program, Fellows will develop their ability to lead, teach and learn from other members of the healthcare team as well as honing their consultative skills in the performance and interpretation of diagnostic tests and procedures. How much independence a Fellow is given, is dependent upon the attending’s judgment of progress and skills level. Training will include instruction in the prevention, therapeutics and management of cardiovascular diseases as well as the social, humanistic, moral and ethical aspects of cardiovascular disease. Fellows will demonstrate empathy for patients and their families by attention to pain control, patient comfort, family counseling, informed consent as well as the ethical and legal principles involved with care and end of life decisions.

Throughout years 2 and 3, Fellows are expected to continue to refine their clinical skills and assume additional responsibilities in the management of patients with cardiovascular disease, obtain
additional training and experience in the performance and applications of diagnostic and therapeutic procedures while under the direct supervision of the faculty member.

**Teaching/Learning Activities**

All teaching activities are carried out by the faculty of The Tulane University School of Medicine. Faculty members are expected to demonstrate the highest standards of patient care, scholarship and clinical knowledge in their capacity as educators and role models for the trainees. The Faculty-Fellow ratio is approximately 1:1.5.

Because the Division of Cardiology is directly affiliated with the Department of Medicine and the training program in Internal Medicine, Fellows are able to maintain their skills in the aspects of general internal medicine and those that relate to Cardiology. They will interact closely with the medicine residents, interns and students as they rotate through the cardiology services. Fellows will also maintain close working relationships with faculty and Fellows in other divisions of Medicine and in other departments in their role as consultative physicians. They will also work closely with technicians, physician assistants, nurses and other staff in the division.

Fellows must also participate in a weekly outpatient clinic during their 36 months training. This important aspect of the training will allow Fellows to apply what they are learning in their clinical rotations to the actual practice of medicine, under the guidance and supervision of their clinical mentor. The Fellows' primary continuity clinics are set up at UHMOB of the Interim LSU Public Hospital with a secondary continuity clinic at the VA in New Orleans.

**How to Prepare for Journal Club**

**Standardized Checklist of Review Criteria**

1. What type of study is this article? (Consult the definitions in glossary of Study design at http://www.ajo.com)
   a. Randomized or non-randomized clinical trial
   b. Interventional case series or case report
   c. Cohort study or case-control study
   d. Cross-sectional study
   e. Observational case series or case report
   f. Experimental study
   g. Meta-analysis of literature

2. Review the manuscript sections
   a. Title: Is the title accurate, concise, and complete?
   b. Introduction: Are the purposes of the study, the research rationale, and the hypothesis described? Is the pertinent literature reviewed and cited accurately?
3. Design

a. Methods: Is the description of the study methodology accurate, complete, and appropriate? Does the methods section inadvertently contain results or discussion? Do the methods adequately describe the 1) Setting (Multi-center, institutional, referral, academic, or clinical practice); 2) Patients or Study Population including patient numbers, one or both eyes, selection procedures, inclusion/exclusion criteria, randomization, allocation and masking; 3) Intervention or Observation Procedure(s) (treatments and controls); and 4) Main Outcome Measure(s): (primary, secondary, other).

b. Human Subject Participation in Experimental Investigations: Does the manuscript describe the approval from the appropriate Institutional Review Board (IRB) or equivalent monitoring agency? Was appropriate informed consent obtained from the patients or subjects? Does the research conform to generally accepted scientific principles embodied in the World Medical Association Declaration of Helsinki (revised 1989).

c. Use of Animals in Biomedical Research: Does the manuscript describe the animal care protocol, name the institution that sponsored the study, and identify relevant IRB approval? Does the research conform to generally accepted principles of animal maintenance and care (Association for Research in Vision and Ophthalmology guidelines)?

d. Statistics: Was the statistical analysis valid? When P values are used, is the actual P value (for example \( P = .032 \)) provided or is an inequality used (for example \( P < .05 \))? In the reporting of the basic summary statistics, are the mean and standard error, as well as confidence limits, provided to help the reader understand the conclusions of the study? Are the statistical models used (analysis of variance, covariance, multiple regressions) specified?

e. Results: Are the outcomes and measurements provided in an objective sequence? Are the data provided in a clear and concise manner? Do the tables and figures accurately summarize the data or add to the information presented in the text? Does the data report confidence intervals (usually at the 95% interval) and exact P values or other indications of statistical significance?

f. Discussion: Does the discussion accurately describe the results? Does it identify any statistically or clinically significant limitations or qualifications of the study? Do the authors accurately state the conclusions of the study? Are there overgeneralizations or undue speculations in the discussion? Is equal emphasis given to positive and negative findings?

**Evaluation**

We feel strongly that frequent evaluation and constructive feedback are essential for Fellows to learn and grow during their training. It is therefore imperative that Attendings discuss goals and learning objective at the start of each rotation. They must also provide feedback and discuss performance with each Fellow, particularly at the end of the rotation.

Fellow and faculty evaluations are officially documented each month using the web-based E*Value (www.e-value.net) program. Fellows are evaluated monthly through E*Value (www.e-value.net) by the faculty members, health professionals, nurses, and technicians with whom they have worked.
using the standard ABIM competency categories, as well as rotation-specific learning objectives set forth by each rotation. In addition, Fellows are evaluated through E*Value (www.e-value.net) by their peers.

Evaluations and feedback in the system may be accessed via www.e-value.net, using a password to gain access to the secure program from any computer. Both parties (evaluators) must have completed their assigned evaluation before either party is able to view their feedback.

Evaluation of performance is based on the following standard ABIM Competencies as well as the learning objectives for each rotation, as set forth by the Rotation faculty (see individual rotation descriptions): Patient Care, Medical Knowledge, Interpersonal and Communication Skills, Professionalism, Practice-Based Learning, and Systems-Based Care.

The Program Director meets at least twice a year one-on-one with each Fellow to discuss each trainee’s performance and overall view of his/her training progress. The program director also completes a final evaluation for Fellows who are leaving the program each year. The Program Director also monitors a procedure report to make sure that each Fellow has participated in the appropriate number of required procedures.

Quarterly Fellow meetings are held by the Program Director and Section Chief to air any issues or grievances that may need to be addressed, although Fellows may speak freely to the program director (or to the Chief Fellow) at any time if they have a concern about any aspect of their training. Twice a year, Fellows are asked to evaluate the program as a whole, and are encouraged to offer suggestions for improvement.

**Required Conferences**

**Core Curriculum Conference Series**

This series runs for one hour weekly through the 3 year training program and includes the following topics:

- Acute Coronary Syndromes
- Antiarrhythmic therapy
- Antiplatelet therapy
- Atrial Fibrillation
- Atherosclerosis
- CABG/On and Off Pump
- Cardiac MRI
- Cardiac Rehab
- Cardiovascular Evaluation for nonsurgical treatment
- Management of Acute CVA
- Medical Genetics
- NSTEMI Guidelines
- Nuclear Cardiology
- Pacemakers/ICDs
- Pacers, Pumps, and Politics
- Pain Management
- Peripheral Arterial Diseases
- Peripheral Vascular Disease
- Pre-op evaluation
Carotid Stenting
Chronic Stable Angina
Congenital Heart Disease
Conscious Sedation
CT Angiography for the Cardiologist
CV Evaluation for Non-Cardiac Surgery
Diabetes Mellitus and Cardiovascular Diseases
Echocardiography
Electrocardiography
End of Life Decision Making
Mechanisms and Indications
Ethics
Geriatric care of the cardiology patient
Heart Defects
Heart Failure
Hypertension
Intro to Echo/Doppler
Malpractice Counsel
Physician impairment
Pulmonary HTN
Cardiovascular disease and the pregnant patient
Preventive Medicine
Radiation Safety
Renal Artery Stenosis
Risk Management/Risk Analysis
Risk stratifying post-MI
Sleep/fatigue
Stress Testing
STEMI Guidelines
Syncope
SVT/Ablation
Unstable Angina
Valvular Heart Disease
Venous Thrombosis
Ventricular Tachycardia

The following Fellow lectures and/or seminars have priority over other clinical or research activities.

<table>
<thead>
<tr>
<th>Fellowship Orientation Lecture Series</th>
<th>July/August</th>
</tr>
</thead>
<tbody>
<tr>
<td>EKG conference</td>
<td>Every Monday – 7:00 AM</td>
</tr>
<tr>
<td>Core Curriculum Conference (Imaging/Nuclear, CHF, ACHD, Vascular Medicine etc.)</td>
<td>Every Tuesday – 7:00 AM</td>
</tr>
<tr>
<td>Cardiology Grand Rounds/Cardiology Vascular Biology Conference</td>
<td>Every Wednesday – 7:00 AM</td>
</tr>
<tr>
<td>Cardiac Cath Conference</td>
<td>Every Thursday – 7:00 AM</td>
</tr>
<tr>
<td>Device Conference</td>
<td>First Friday of each month – 7:00 AM</td>
</tr>
<tr>
<td>Journal Club in rotation with the Morbidity &amp; Mortality Conference and the Research Conference</td>
<td>Second, Third and Fourth Fridays of each month – 7:00 AM</td>
</tr>
</tbody>
</table>
Preventive Cardiology Series or Congenital Heart Disease Series Conference | Friday morning (occasionally)

**Methods in Clinical Research Conference Series**  
A conference series conducted by the General Clinical Research Center. All Fellows must attend this eight session conference series at least once during their Fellowship.

**Required Core Clinical Rotations**  
Fellows are provided instruction and experience in patient care and management, diagnosis, prevention and treatment of cardiovascular disease and related sciences through the following required curriculum

### Year One (PGY-IV)

<table>
<thead>
<tr>
<th>Rotation</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiology Consultations and Coronary Care Unit</td>
<td>3 months (2 months in Consultation, 1 month in Coronary Care Unit)</td>
</tr>
<tr>
<td>Cardiac Catheterization</td>
<td>2 months</td>
</tr>
<tr>
<td>Electrophysiology</td>
<td>1 month</td>
</tr>
<tr>
<td>Cardiology Vascular Disease</td>
<td>1 month</td>
</tr>
<tr>
<td>Congestive Heart Failure and Heart Transplant</td>
<td>2 consecutive months</td>
</tr>
<tr>
<td>Non-Invasive Cardiology, including Echocardiography, TTE, TEEs, Doppler, Stress Testing, and Holter Monitoring</td>
<td>1 month</td>
</tr>
<tr>
<td>Nuclear Cardiology</td>
<td>1 month</td>
</tr>
<tr>
<td>Research (concurrent with Rehabilitation and Congenital Heart Disease)</td>
<td>1 month</td>
</tr>
<tr>
<td>Primary Continuity Clinic, UMCNO</td>
<td>½ day every other week concurrent with rotation</td>
</tr>
<tr>
<td>Secondary Continuity Clinic, VA</td>
<td>½ day weekly, concurrent with rotation</td>
</tr>
</tbody>
</table>

### Year Two (PGY-V)

<table>
<thead>
<tr>
<th>Rotation</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiology Consultations and Coronary Care Unit</td>
<td>4 months (2 months in Consultations and 2 months in Coronary Care Unit)</td>
</tr>
<tr>
<td>Cardiac Catheterization</td>
<td>2 months</td>
</tr>
<tr>
<td>Nuclear Cardiology</td>
<td>1 month</td>
</tr>
<tr>
<td>Electrophysiology</td>
<td>1 month</td>
</tr>
<tr>
<td>Non-Invasive Cardiology, including Echocardiography, TTE, TEEs, Doppler, Stress Testing</td>
<td>1 month</td>
</tr>
<tr>
<td>Testing and Holter Monitoring</td>
<td>2 consecutive months</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Congestive Heart Failure and Heart Transplant</td>
<td>2 consecutive months</td>
</tr>
<tr>
<td>Research (concurrent with Cardiac Rehabilitation and Congenital Heart Disease)</td>
<td>1 month concurrent with Cardiac Rehabilitation and Congenital Heart Disease</td>
</tr>
<tr>
<td>Primary Continuity Clinic, UMCNO</td>
<td>½ day every other week concurrent with rotation</td>
</tr>
<tr>
<td>Secondary Continuity Clinic, VA</td>
<td>½ day weekly concurrent with rotation</td>
</tr>
</tbody>
</table>

**Year Three (PGY-VI)**

<table>
<thead>
<tr>
<th>Cardiac Catheterization</th>
<th>2 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiology Consultations and Coronary Care Unit</td>
<td>3 months (2 months in Consultation and 1 month in Coronary Care Unit)</td>
</tr>
<tr>
<td>Cardiology Vascular Medicine</td>
<td>1 month concurrent with MRI/CTA</td>
</tr>
<tr>
<td>MRI/CTA</td>
<td>1 month concurrent with Cardiology Vascular Medicine</td>
</tr>
<tr>
<td>Non-Invasive Cardiology, including Echocardiography, TTE, TEEs, Doppler, Stress Testing and Holter Monitoring</td>
<td>2 months</td>
</tr>
<tr>
<td>Nuclear Cardiology</td>
<td>2 months</td>
</tr>
<tr>
<td>Research</td>
<td>1 month</td>
</tr>
<tr>
<td>Primary Continuity Clinic, UMCNO</td>
<td>½ day every other week concurrent with rotation</td>
</tr>
<tr>
<td>Secondary Continuity Clinic, VA</td>
<td>½ day weekly concurrent with rotation</td>
</tr>
</tbody>
</table>

**Rotations**

**Cardiology Consultation Service**

**Rotation Sites**

**Site 1: Tulane Medical Center**
- Faculty: Asif Anwar, MD; Gholam Ali, MD; Aaron Sweeney, MD; Robert Hendel, MD; Rohan Samson, MD; Abhishek Jaiswal, MD; Owen Mogabgab, MD

**Site 2: Southeast Louisiana Veterans Health Care System**
- Faculty: Aaron Sweeney, MD; Gholam Ali, MD; Mark Cassidy, MD; Thierry H. Le Jemtel, MD; Kevin Cartwright, MD; Robert Hendel, MD

**Site 3: University Medical Center New Orleans (UMCNO)**
- Faculty: Gary Sander, MD; Robert Hendel, MD; Thierry H. Le Jemtel, MD; Aaron Sweeney, MD;
Rohan Samson, MD

Time Required
- Year One: 2 months
- Year Two: 2 months
- Year Three: 1 - 2 months
- Hours: Mon - Fri, 7 a.m. to 5 p.m.

Learning Objectives and Expectations
- Fellows have compensative responsibility from day one of their training. The amount of independence allowed to the Fellow is dependent upon the attending’s judgment of the Fellow’s progress and skills level.
- The Consult Fellow will be the initial cardiologist to evaluate consultations requested by all in-patient services at the assigned rotational hospital.
- The Fellow will learn to deal effectively and professionally with patients, families, other medical personnel, as well as outside lay persons/potential patients who request to speak with a cardiologist.
- As the cardiology consultant “on call”, the Fellow will field all requests for assistance with cardiac problems and either deal with them himself/herself or triage them to the appropriate service.
- In all these activities, the Fellow will develop sufficient expertise that he/she will be able to function independently as an effective consultant cardiologist.

Procedure Requirements
Ambulatory ECG/Holter – 255 (CCU/Consults/Clinic)

Learning Activities
- Bedside cardiovascular history and physical examination
- ECG interpretation consistent with level of training
- Interpretation of treadmill exercise tests, Holter monitors and tilt table tests
- Correlate physical exam with other cardiology laboratory diagnostic techniques, for example echocardiograms, cardiac catheterizations, radionuclide and other non-invasive imaging (MRI, CT scans, etc.).

Curriculum Content and Methods
- ACC/AHA guidelines for pre-operative cardiac evaluation
- Review article on management of atrial fibrillation (probably the single most common reason for request for consultations)
- Daily review of echocardiograms and other imaging techniques on patients being seen by the consultation service
- Direct observation by the attending of Fellow’s cardiac physical examination
- Clinical and non-invasive assessment of prosthetic heart valves (tissue and mechanical)
- Long-term management of post-CABG, post-PTCA, post-MI patients with emphasis on details of “secondary prevention”
- Basics of “primary prevention” of atherosclerosis (see Preventive Cardiology curriculum)
Supervision
No procedures are performed on this service; however, Fellows are always supervised by the Attending

Evaluation Process
- Fellows will be evaluated on each rotation using a competency-based system on E*Value (www.e-value.net).
- One-on-one feedback of accuracy and completeness of patient histories
- Direct observation by the attending of Fellow’s cardiac physical examination
- Review and critique with Fellows their independent interpretation of diagnostic studies
- Review and critique with Fellows their assessment and plans for patient’s on whom they have consulted
- Observe and provide feedback on how Fellows interact with patients, families and other medical personnel

Reading List


ACGME Competencies for the Cardiology Consultation Service Rotation

**Medical Knowledge**

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ability to obtain a complete medical history, perform a careful and accurate physical examination with emphasis on cardiac findings and review charts and pertinent records.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>2. Ability to write a concise evaluation, assess the cardiovascular risk of the patient and make therapeutic decisions and proper interventions based on patient preferences, scientific evidence and sound clinical judgment.</td>
<td>DPC, AR, CAC, CC, ECG, FS</td>
<td>AE</td>
</tr>
<tr>
<td>3. Effectively evaluate and manage patients with complex cardiac illnesses, particularly, acute coronary syndromes, congestive heart failure, valvular heart disease and cardiac transplantation patients.</td>
<td>DPC, AR, FS, CAC, DSP, CC</td>
<td>AE</td>
</tr>
<tr>
<td>4. Ability to risk stratify patients after being evaluated by echocardiography, cardiac stress test, coronary angiograms, nuclear cardiovascular procedures and other invasive and non-invasive procedures.</td>
<td>ECG, CC, GR</td>
<td>AE</td>
</tr>
<tr>
<td>5. Effectively direct the team performing CPR and advance cardiac life support.</td>
<td>DPC, IL</td>
<td>AE</td>
</tr>
<tr>
<td>6. Ability to recognize and deal with complications from invasive and non-invasive procedures.</td>
<td>DPC, FS,</td>
<td>AE</td>
</tr>
</tbody>
</table>
### Ability to participate in behavior modification and strategies to educate patients and other health professionals in the management of cardiovascular risk factors and life style modification.

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Familiarity with basic science concepts and mechanisms of cardiovascular disease.</td>
<td>CC, RC, JC, IL</td>
<td>AE, ECR</td>
</tr>
<tr>
<td>2. Familiarity with current medical literature, clinical trials and evidence based medicine in cardiology.</td>
<td>JC, CC, GR</td>
<td>AE</td>
</tr>
<tr>
<td>3. Familiarity with the broad spectrum of cardiovascular diseases.</td>
<td>CC, GR</td>
<td>AE PR</td>
</tr>
<tr>
<td>4. Familiarity with the pathophysiological Principals of cardiovascular disease.</td>
<td>CC, GR</td>
<td>AE, DSP</td>
</tr>
</tbody>
</table>

### Ability to participate in the discussion of end-of-life issues with patients and their families.

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Communicate effectively the consult findings with physician colleagues and other members of the health care team in a timely fashion to assure comprehensive patient care.</td>
<td>DPC, AR, FS</td>
<td>AE, PR</td>
</tr>
<tr>
<td>2. Present findings to patient and family members in a compassionate and informative manner.</td>
<td>DPC, AR</td>
<td>AE, PR</td>
</tr>
<tr>
<td>3. Provide educational instructions and other learning tools to patients to reinforce behavioral modification.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
</tbody>
</table>

### Patient Care

### Interpersonal Skills and Communication

### Professionalism
and illness.

**Practice-Based Learning and Improvement**

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.  Commitment to scholarship and the use of evidence based cardiovascular medicine.</td>
<td>CC, GR FS</td>
<td>AE, ECR</td>
</tr>
<tr>
<td>2.  Broad reading of the cardiovascular literature and access and research of Medline and internet tools.</td>
<td>CC, GR, JC, RC</td>
<td>AE, ECR</td>
</tr>
</tbody>
</table>

**Systems-Based Practice**

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.  Understand the complexities of cardiovascular disease patients and utilize the multidisciplinary resources necessary to care for them.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>2.  Collaborate with other members of the health care team to assure comprehensive cardiac care.</td>
<td>DPC, AR</td>
<td>AE, PR</td>
</tr>
<tr>
<td>3.  Understand the system complexities in invasive and noninvasive cardiology.</td>
<td>DPC, AR, GR CAC</td>
<td>AE</td>
</tr>
<tr>
<td>4.  Willingness to learn by participation in ward rounds, teaching conferences and other educational activities.</td>
<td>DPC, AR, GR</td>
<td>AE</td>
</tr>
<tr>
<td>5.  Effective utilization of risk stratification using evidence-based medicine.</td>
<td>DPC, AR, CC, IL</td>
<td>AE</td>
</tr>
<tr>
<td>6.  Develop effective communication with referring physician, health care team, patient and their family, regarding purpose and findings of the consult.</td>
<td>DPC, AR</td>
<td>AE, PR</td>
</tr>
<tr>
<td>7.  Expand learning in out-patient ultrasound and nuclear cardiology to optimize understanding of patients risk stratification.</td>
<td>DPC, AR, CC, IL</td>
<td>AE</td>
</tr>
<tr>
<td>8.  Consideration of cost effectiveness and outcome measurements of tests and interventions associated with consultations.</td>
<td>DPC, AR, FS</td>
<td>AE</td>
</tr>
</tbody>
</table>
Coronary Care Unit (CCU)

Rotation Sites

Site 1: Tulane Medical Center
Faculty: Asif Anwar, MD; Gholam Ali, MD; Aaron Sweeney, MD; Robert Hendel, MD; Rohan Samson, MD; Abhishek Jaiswal, MD; Owen Mogabgab, MD

Site 2: Southeast Louisiana Veterans Health Care System
Faculty: Aaron Sweeney, MD; Gholam Ali, MD; Mark Cassidy, MD; Thierry H. Le Jemtel, MD; Kevin Cartwright, MD; Robert Hendel, MD

Site 3: University Medical Center New Orleans (UMCNO)
Faculty: Gary Sander, MD; Thierry Le Jemtel, MD; Aaron Sweeney, MD; Rohan Samson, MD; Robert Hendel, MD; Anand Irimpen, MD

Time Required
- Year One: 1 month
- Year Two: 1 – 2 months
- Year Three: 1 month
- Hours: Mon - Fri, 8 a.m. to 5 p.m.

Learning Objectives and Expectations
- Fellows have compensative responsibility from day one of their training. The amount of independence allowed to the Fellow is dependent upon the attending's judgment of the Fellow's progress and skills level.
- Fellows will gain the knowledge, skills and abilities to evaluate and manage patients in the CCU. They will also learn to communicate effectively with patients, their families as well as educating house staff and medical students in the appropriate management and care of patients with coronary disease processes.
- Fellows will gain the knowledge, skills and abilities to:
  - Educate and guide house staff and medical students in appropriate methods of patient management
  - Educate and guide house staff in procedures including swan-ganz catheterization, arterial line cannulation, temporary pacemaker, and cardioversion
  - Identify risk stratification of post-myocardial infarction and unstable angina patients
  - Appreciate risk factors for atherosclerosis
  - Participate actively in rounds
  - Communicate actively with nursing staff, patients and their families

Procedure Requirements
Cardiac Cath, RH: (in combination with Catheterization Rotations): 28

Learning Activities
- Evaluation and management of patients with the following diagnoses:
- ST segment elevation myocardial infarction
- NonST segment elevation acute coronary syndrome
• Decompensated heart failure
• Ventricular and atrial tachyarrhythmias in critically ill patients
• Acute valvular heart disease
• Pericardial tamponade
• Acute aortic dissection
• Symptomatic Brady arrhythmias
• Complications from procedures
• Become proficient in the performance and interpretation of the following procedures:
  • Swan-ganz catheterization
  • Arterial line
  • Cannulation, temporary pacemaker, and cardioversion
• Guide and educate house staff on appropriate patient management decisions

Curriculum Content and Methods
• Attend cardiology grand rounds (every Wednesday) and medical grand rounds (every Wednesday)
• Core curriculum (every Tuesday)
• Appropriate handouts accompany the lectures

Supervision
The attending physician supervises all cardioversions, swan ganz catheterizations and temporary pacemaker placements

Evaluation Process
• Fellows will be evaluated on each rotation using a competency-based system on E*Value (www.e-value.net).
• Fellows spend 7 consecutive days with one attending each week of the month. Each attending evaluates and gives feedback to the Fellow.
• Fellow competency is readily evaluated by the attending via the following:
  • Rounds in A.M. and P.M., evaluating how well the Fellow is able to recognize, evaluate and treat particular patients with the above listed diagnoses. Constant contact throughout the day (and often the night) obtaining the Fellows opinion on all cases that are admitted the CCU
  • Feedback from house staff as to the Fellow’s guidance and teaching abilities Feedback from nursing staff as to the Fellow’s ability to efficiently run the CCU

Reading List


ACGME Competencies for the Coronary Care Unit (CCU) Rotation

**Patient Care**

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<td>AE</td>
</tr>
<tr>
<td></td>
<td>Ability to recognize the physical findings of chronic congestive heart failure, acute pulmonary edema, mitral regurgitation, mitral stenosis, aortic stenosis, aortic regurgitation, and tricuspid regurgitation.</td>
<td>DPC, AR, FS</td>
</tr>
<tr>
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</tr>
<tr>
<td>2.</td>
<td>Write concise, accurate and informative histories, physical examinations and progress notes with a cardiology focus.</td>
<td>DPC, AR</td>
</tr>
<tr>
<td>3.</td>
<td>Ability to formulate comprehensive and accurate problem lists, differential diagnoses and plans of management for patients with acute cardiac illness.</td>
<td>DPC, AR, CC</td>
</tr>
<tr>
<td>4.</td>
<td>Effectively evaluate and manage patients with acute cardiac illness; particularly acute coronary syndromes, acute myocardial infarction, congestive heart failure, pulmonary edema, and acute valvular heart disease.</td>
<td>DPC, AR, CAC</td>
</tr>
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<td>5.</td>
<td>Effectively manage patients with undiagnosed chest pain, including the appropriate use of diagnostic testing.</td>
<td>DPC, AR</td>
</tr>
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<td>6.</td>
<td>Ability to perform and recognize major abnormalities of cardiac stress tests, cardiac Echo and coronary angiograms.</td>
<td>DPC, DSP</td>
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<td>7.</td>
<td>Ability to interpret complex electrocardiograms and rhythm strips.</td>
<td>DPC, AR, ECG</td>
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<tr>
<td>8.</td>
<td>Effectively evaluate and manage patients who have undergone interventional procedures.</td>
<td>DPC, AR, CAC</td>
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<td>9.</td>
<td>Ability to perform basic ventilator management.</td>
<td>DPC, AR</td>
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<td>10.</td>
<td>Ability to place and manage pulmonary artery (Swan-Ganz) catheters and temporary pacemakers.</td>
<td>DPC, AR, DSP</td>
</tr>
<tr>
<td>11.</td>
<td>Ability to administer emergency thrombolytic treatment.</td>
<td>DPC, DSP, AR</td>
</tr>
<tr>
<td>12.</td>
<td>Ability to perform CPR and advanced cardiac life support.</td>
<td>DPC, DSP</td>
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<tr>
<td>13.</td>
<td>Willingness and ability to help patients undertake basic strategies for prevention of cardiovascular disease, including modifications of diet and physical activity, and cessation of use of tobacco.</td>
<td>DPC, AR</td>
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<tr>
<td>14.</td>
<td>Participation in and later leading of discussion of end-of-life issues with families.</td>
<td>DPC, AR</td>
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<tr>
<td>15.</td>
<td>Insert central venous lines and arterial lines with proper technique.</td>
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### Medical Knowledge

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<td>2. Access and critically evaluate current medical information and scientific evidence relevant to acute cardiac care.</td>
<td>DPC, AR</td>
<td>AE</td>
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<td>3. Understand indications for aggressive anticoagulant and antiplatelet therapy as well as the mechanisms of action of the various agents.</td>
<td>DPC, AR</td>
<td>AE</td>
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<tr>
<td>4. Understand the physiologic and pathophysiologic principles of invasive hemodynamic monitoring including indications.</td>
<td>DPC, AR, CAC</td>
<td>AE</td>
</tr>
<tr>
<td>5. Develop and demonstrate in-depth knowledge of the pathophysiology, clinical manifestations, diagnosis and management of cardiac diseases, as seen in a Coronary Care unit.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>6. Develop and demonstrate in-depth knowledge of the principles of diagnosis and management of essential hypertension; ischemic heart disease including unstable angina pectoris and myocardial infarction; congestive heart failure; cardiac arrhythmias especially atrial fibrillation, supraventricular tachycardia, and ventricular arrhythmias; rheumatic heart disease, and congenital heart disease.</td>
<td>DPC, AR, AE</td>
<td></td>
</tr>
<tr>
<td>7. Develop and demonstrate in-depth knowledge of the indications for, principles, complications, and interpretation of ECG, inpatient rhythm monitoring, exercise and chemical stress tests, electrophysiologic studies, transthoracic and transesophageal ECHO, nuclear cardiac imaging, right and left heart catheterization, coronary angiography, and percutaneous interventions.</td>
<td>DPC, DSP, AR</td>
<td>AE, DSP</td>
</tr>
<tr>
<td>9. Develop in-depth knowledge of the strategies for cessation of use of tobacco.</td>
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### Interpersonal Skills and Communication

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<td>AE, ECR</td>
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<tr>
<td>2. Communicate effectively with physician colleagues and members of other health care professions to assure timely, comprehensive patient care.</td>
<td>DPC, AR</td>
<td>AE, PR, ECR</td>
</tr>
<tr>
<td>3. Communicate effectively with colleagues when signing out DPC or turning over care to another service.</td>
<td>DPC, AR</td>
<td>AE, PR, ECR</td>
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### Professionalism

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<td>1. Interact professionally toward patients, families, colleagues, and all members of the health care team.</td>
<td>DPC</td>
<td>AE, PR, ECR</td>
</tr>
<tr>
<td>2. Interacting with patients and families in a professionally appropriate manner.</td>
<td>DPC</td>
<td>AE, ECR</td>
</tr>
<tr>
<td>3. Acceptance of professional responsibility as the primary care physician for patients under his/her care.</td>
<td>DPC</td>
<td>AE, ECR</td>
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<tr>
<td>4. Appreciation of the social context of illness.</td>
<td>DPC</td>
<td>AE, ECR</td>
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<td>5. Effective utilization of ethics knowledge and consultants. This includes guidelines for CPR and DNR and end of life cardiac care.</td>
<td>DPC</td>
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### Practice-Based Learning and Improvement

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<th>Principal Educational Goals</th>
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</thead>
<tbody>
<tr>
<td>1. Identify and acknowledge gaps in personal knowledge and skills in care of acute cardiac patients.</td>
<td>DPC, CC, ECR</td>
<td>AE</td>
</tr>
<tr>
<td>2. Develop real-time strategies for filling knowledge gaps that will benefit patients in the Coronary Care unit.</td>
<td>DPC</td>
<td>AE</td>
</tr>
<tr>
<td>3. Commitment to professional scholarship, including systematic and critical perusal of relevant print and electronic literature, with emphasis on integration of basic science with clinical medicine, and evaluation of information in light of the principles</td>
<td>DPC, FS</td>
<td>AE</td>
</tr>
</tbody>
</table>
of evidence-based medicine.

**Systems-Based Practice**

<table>
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<tr>
<th>Principal Educational Goals</th>
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</thead>
<tbody>
<tr>
<td>1. Understand and utilize the multidisciplinary resources necessary to care optimally for acutely ill cardiac patients.</td>
<td>DPC</td>
<td>AE</td>
</tr>
<tr>
<td>2. Collaborate with other members of the health care team to assure comprehensive Coronary Care.</td>
<td>DPC</td>
<td>AE</td>
</tr>
<tr>
<td>3. Use evidence-based, cost-conscious strategies in the care of patients with chest pain and other acute cardiac disease.</td>
<td>DPC</td>
<td>AE</td>
</tr>
<tr>
<td>4. Knowing when to ask for help and advice from Senior Fellows and attending physicians.</td>
<td>DPC</td>
<td>AE, PR</td>
</tr>
<tr>
<td>5. Effective professional collaboration with residents, other Fellows, and faculty consultants from other disciplines such as Radiology and Surgery.</td>
<td>DPC</td>
<td>AE, ECR</td>
</tr>
<tr>
<td>6. Learning by participation in ward rounds, teaching conferences and other educational activities.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>7. Effective collaboration with other members of the health care team, including residents, medical students, nurses, clinical pharmacists, occupational therapists, physical therapists, nutrition specialists, patient educators, speech pathologists, respiratory therapists, enterostomy nurses, social workers, case managers, discharge planners, and providers of home health services.</td>
<td>DPC</td>
<td>AE, ECR</td>
</tr>
<tr>
<td>8. Effective utilization of ethics consultants, including knowing when and how to request consultation, and how best to utilize the advice provided.</td>
<td>DPC</td>
<td>AE</td>
</tr>
<tr>
<td>9. Consideration of the cost-effectiveness of diagnostic and treatment strategies.</td>
<td>DPC</td>
<td>AE</td>
</tr>
<tr>
<td>10. Ability to lead team, including medical students, residents, nurses, clinical pharmacist, case manager, and social worker.</td>
<td>DPC</td>
<td>AE, ECR</td>
</tr>
<tr>
<td>11. Willingness and ability to teach medical students and residents.</td>
<td>DPC</td>
<td>AE, PR</td>
</tr>
</tbody>
</table>
Cardiac Catheterization

Rotation Sites

Site 1: Tulane Medical Center
Faculty: Anand Irimpen, MD; Atul Singla, MD; Owen Mogabgab, MD; Nidal Abi Rafeh, MD; and Charisse Ward, MD

Site 2: Southeast Louisiana Veterans Health Care System
Faculty: Anand Irimpen, MD; Nidal Abi Rafeh, MD; Owen Mogabgab, MD; Atul Singla, MD

Site 3: University Medical Center New Orleans
Faculty: Anand Irimpen, MD; Atul Singla, MD; Nidal Abi Rafeh, MD; Owen Mogabgab, MD; and Charisse Ward, MD

Time Required
- Year One – 2 months
- Year Two – 2 months
- Year Three – 1 - 2 months
- Hours: Mon - Fri, 8 a.m. to 5 p.m.

Learning Objectives and Expectations
- All trainees will gain a clear understanding of the indications, limitations, complications and medical and surgical implications of the findings at cardiac catheterization and angiography, as well as a general understanding of related interventional procedures.
- This includes an understanding of the pathophysiology of cardiovascular disease and the ability to interpret hemodynamic and angiographic data and to use these data to select cases for surgical and catheterization-based therapeutic procedures. All trainees must have a basic understanding of and formal training in radiation physics, radiation safety, fluoroscopy and radiologic anatomy, as well as clinical cardiovascular physiology (e.g., pressure waveforms, shunt calculations, blood flow, resistance calculations).
- Trainees will learn to perform pulmonary artery catheterization with flow-directed catheters by percutaneous (subclavian, femoral and internal jugular) routes. All trainees must be capable of performing temporary right ventricular pacemaker insertion and should have some experience performing right and left heart catheterization, including ventriculography and coronary angiography. In addition, they should learn to perform pericardiocentesis.

Learning Activities
- Pre-cardiac catheterization evaluation and pre-procedure preparation.
- Ability to obtain informed consent for cardiac catheterization understanding the risks and benefits of invasive cardiac imaging.
- Arterial and venous vascular access emphasizing the femoral approach.
- Performance of right heart cardiac catheterization including proper data acquisition and interpretation.
- Performance of coronary artery angiography including interpretation of angiographic images.
• Performance of ventriculography including measurement of pressures and calculation of ejection fraction.
• Ability to calculate valve areas and regurgitant fraction.
• Performance of a saturation run and calculation of a shunt fraction.
• Understand the mechanics of intraaortic balloon counterpulsation.
• Performance of pericardiocentesis.
• Placement of a temporary transvenous pacing wire.
• Post-cardiac catheterization management including assessment of access site complications.

**Curriculum Content and Methods**

- Performance of catheterization techniques are learned directly by participating in procedures with attending physicians.
- Didactic lectures on calculation of valve areas, shunt fraction, and ventricular function.
- Weekly conferences discussing cardiac catheterization and interventional patients.
- Intensive discussion by the attending with the Fellow after each case reviewing angiographic and hemodynamic findings.

**Supervision**

All aspects of procedures (including vascular access) are directly supervised by the attending catheterization laboratory attending who is scrubbed and assisting the Fellow during procedures. Interpretation and reporting of catheterization data is completed by the Fellow following discussion and review of the case with the attending.

**Evaluation Process**

- Fellows will be evaluated on rotation using a competency-based system, using the E*Value (www.e-value.net) program.
- Fellows are evaluated directly by the attending cardiologists supervising their procedures. Evaluation of procedural skills is reported to the Fellows following each case in an oral manner and after each month on service with a web based evaluation process.
- Concerns regarding a Fellow’s procedural skills are brought to the attention of the Director of the Catheterization Laboratory for more intensive discussion and instruction on an individualized basis.
- Electronic database procedure logs are maintained and examined at the end of each month to track the number of procedures successfully completed.
- Complications related to cardiac catheterization are discussed at a monthly meeting with all Attendings and Catheterization Laboratory Fellows present.

**ACGME Competencies for the Cardiology Catheterization Service Rotation**

**Patient Care**

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</table>

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<table>
<thead>
<tr>
<th></th>
<th>Take a complete medical history and perform a careful and accurate physical examination with a cardiology focus.</th>
<th>DPC, AR</th>
<th>AE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Explain the risks, benefits, and potential complications of cardiac catheterization.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>3.</td>
<td>Perform and interpret the results of diagnostic left and right heart catheterizations, coronary angiograms, and ventriculograms.</td>
<td>DPC, DSP, AR</td>
<td>AE, DSP</td>
</tr>
<tr>
<td>4.</td>
<td>Perform and interpret the results of aortograms, carotid, renal and peripheral angiograms.</td>
<td>DPC, DSP, AR</td>
<td>AE, DSP</td>
</tr>
<tr>
<td>5.</td>
<td>Perform and interpret hemodynamic assessments of various cardiac diseases including pericardial disease, restrictive heart disease, congenital heart disease, intra-cardiac shunts, and valvular heart disease.</td>
<td>DPC, DSP, AR</td>
<td>AE, DSP</td>
</tr>
<tr>
<td>6.</td>
<td>Evaluate severity of coronary artery atherosclerotic disease using various methods including measurement of coronary flow reserve, fractional flow reserve, use of quantitative lesion assessment, and intravascular ultrasound.</td>
<td>DPC, DSP, AR</td>
<td>AE, DSP</td>
</tr>
<tr>
<td>7.</td>
<td>Recognize and manage complications associated with cardiac catheterizations and interventions including care of the percutaneous sheath insertion site.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>8.</td>
<td>Evaluate, manage, and perform cardiac catheterization in acute coronary syndromes, and congestive heart failure.</td>
<td>DPC, DSP, AR</td>
<td>AE, DSP</td>
</tr>
<tr>
<td>9.</td>
<td>Placement and management of intra-aortic balloon pumps and temporary pacemakers.</td>
<td>DPC, DSP, AR</td>
<td>AE, DSP</td>
</tr>
<tr>
<td>10.</td>
<td>Assist in interventional procedures such as carotid artery stenting, transcatheter closure of patent foramen ovale and atrial septal defects, renal artery stenting, transcatheter repair of abdominal aortic aneurysms, peripheral angioplasty and stenting, and coil embolization of artero-venous malformations.</td>
<td>DPC, AR, DSP</td>
<td>AE, DSP</td>
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<tr>
<td>11.</td>
<td>Follow up and routine care of the post catheterization and post-intervention patient.</td>
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**Medical Knowledge**

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27
1. Expand clinically applicable knowledge base of the basic and clinical sciences underlying the care of patients with chest pain and acute cardiac disease.  
   
2. Access and critically evaluate current medical information and scientific evidence relevant to acute cardiac care.  
   
3. Understand indications for aggressive anticoagulant and antiplatelet therapy as well as the mechanisms of action of the various agents.  
   
4. Understand the physiologic and pathophysiologic principles of invasive hemodynamic monitoring including indications.  
   
5. Develop and demonstrate in-depth knowledge of the pathophysiology, clinical manifestations, diagnosis and management of cardiac diseases.  
   
6. Develop and demonstrate in-depth knowledge of the principles of diagnosis and management of ischemic heart disease including unstable angina pectoris and myocardial infarction; congestive heart failure; rheumatic heart disease, and congenital heart disease.  
   
7. Develop and demonstrate in-depth knowledge of the indications for, principal, complications, and interpretation of right and left heart catheterization, coronary angiography, and ventriculography.  
   
   

**Interpersonal Skills and Communication**

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<td>2. Communicate effectively with physician colleagues and members of other health care professions to assure timely, comprehensive patient care.</td>
<td>DPC, FS</td>
<td>AE, PR, ECR</td>
</tr>
<tr>
<td>3. Communicate effectively with colleagues when discussing results</td>
<td>DPC, FS</td>
<td>AE, PR, ECR</td>
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</table>
of various cardiac catheterization and interventions and further management.

Professionalism

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<td>AE, PR, ECR</td>
</tr>
<tr>
<td>2. Interacting with patients and families in a professionally appropriate manner.</td>
<td>DPC, PC</td>
<td>AE, ECR</td>
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<tr>
<td>3. Acceptance of professional responsibility as the primary care physician for patients under his/her care.</td>
<td>DPC, PC</td>
<td>AE, ECR</td>
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<td>4. Appreciation of the social context of illness.</td>
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<td>5. Effective utilization of ethics knowledge and consultants. This includes guidelines for CPR and DNR and end of life cardiac care.</td>
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Practice-Based Learning and Improvement

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<tr>
<td>1. Identify and acknowledge gaps in personal knowledge and skills in care of acute cardiac patients.</td>
<td>DPC, CC, ESR</td>
<td>AE</td>
</tr>
<tr>
<td>2. Develop real-time strategies for filling knowledge gaps that will benefit patients in the coronary care unit.</td>
<td>DPC</td>
<td>AE</td>
</tr>
<tr>
<td>3. Commitment to professional scholarship, including systematic and critical perusal of relevant print and electronic literature, with emphasis on integration of basic science with clinical medicine, and evaluation of information in light of the principles of evidence-based medicine.</td>
<td>DPC, FS</td>
<td>AE</td>
</tr>
</tbody>
</table>

Systems-Based Practice

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Understand and utilize the multidisciplinary resources necessary to care optimally for acutely ill cardiac patients.</td>
<td>DPC, PC</td>
<td>AE</td>
</tr>
</tbody>
</table>
2. Collaborate with other members of the health care team to assure comprehensive coronary care.  
   DPC    AE

3. Use evidence-based, cost-conscious strategies in the care of patients with chest pain and other acute cardiac disease.  
   DPC    AE

4. Knowing when to ask for help and advice from Senior Fellows and attending physicians.  
   DPC    AE, PR

5. Effective professional collaboration with residents, other Fellows, and faculty consultants from other disciplines such as Radiology, Neurology and Surgery.  
   DPC    AE, ECR

6. Learning by participation in ward rounds, teaching conferences and other educational activities.  
   DPC, AR    AE

7. Effective collaboration with other members of the health care team, including residents, medical students, nurses, and cath lab technicians.  
   DPC    AE, ECR

8. Effective utilization of ethics consultants, including knowing when and how to request consultation, and how best to utilize the advice provided.  
   DPC, PC    AE

   DPC    AE

10. Ability to lead team, including medical students, residents, nurses, and cath lab technicians.  
    DPC    AE, ECR

11. Willingness and ability to teach medical students and residents.  
    DPC    AE, PR

**Non-Invasive Cardiology**

**Rotation Sites**

**Site 1: Tulane Medical center**  
Faculty: Mark Cassidy, MD; Asif Anwar, MD; Gholam Ali, MD; Aaron Sweeney, MD; Nidal Abi Rafeh, MD; Anand Irimpen, MD; Kevin Cartwright, MD; Robert Hendel, MD; Rohan Samson, MD

**Site 2: Southeast Louisiana Veterans Health Care System**  
Faculty: Mark Cassidy, MD; Gholam Ali, MD; Anand Irimpen, MD; Nidal Abi Rafeh, MD; Kevin Cartwright, MD; Aaron Sweeney, MD; Robert Hendel, MD

**Site 3: University Medical Center New Orleans (UMCNO)**  
Faculty: Gary Sander, MD; Gholam Ali, MD; Robert Hendel, MD; Aaron Sweeney, MD; Rohan Samson, MD
Time Required
- Year One: 3 months
- Year Two: 2~3 months
- Year Three: 2~3 months
- Hours: Mon-Fri, 8 a.m. to 5 p.m.

Learning Objectives and Expectations
- Fellows have compensative responsibility from day one of their training. The amount of independence allowed to the Fellow is dependent upon the attending's judgment of the Fellow's progress and skills level.
- Fellows will gain a comprehensive knowledge of the following:
  - To learn basic cognitive and technical skills in ultrasound technology in acquiring the basic 2D echo images, Color and Spectral Doppler exam.
  - To learn the clinical indications in the evaluation and management of cardiovascular disease
  - To learn the limitations and pitfalls of ultrasound physics
  - To learn to generate an accurate and comprehensive echo report from the acquired echo modalities
  - Fellows will receive specific training in echocardiography (including transthoracic, Doppler, transesophageal, stress and dobutamine) to prepare the Fellow for Level II expertise in echo interpretation.
  - Fellows will gain experience in the performance and satisfactory interpretation of transthoracic and Doppler echocardiography in patients admitted for specific cardiac disease (i.e., to CICU or PCU), patients with cardiac disease admitted to other hospital services, and outpatients referred for study.

Learning Activities
- Fellows will be expected to gain an understanding and expertise in the following areas:
  - Fundamentals of echo machine “knobology” and scanning from technicians.
  - Assessment of cardiac function including LV regional and global function as well as valvular morphology and function.
  - Interpretation of echocardiograms.
  - Interpretation of doppler studies.
  - Knowledge of the clinical application and interpretation of stress testing modalities to evaluate ischemic heart disease, cardiomyopathies and occasional valve disease.
  - Supervise and interpret all exercise or dobutamine echoes
  - Indications for transesophageal echocardiography, techniques for esophageal intubation
  - Techniques and pharmacology of conscious sedation
  - Methods for adequate visualization of cardiac structure via TEE, and interpretation and reporting these studies
  - Understand the basics of cardiac MRI, especially with respect to post-ischemic viability studies
  - During one-on-one reading sessions throughout the rotation, the following disease processes are discussed (pathophysiology and echo findings) when examples are encountered. Any disease processes that have not turned up will be specifically discussed during the last week of the month.
• TEE indications, technique, safety
• Cardiac tumors including left atrial myxoma
• Left and right atrial thrombus
• Patent foramen ovale
• Spontaneous echo contrast
• Ruptured mitral valve chordae/papillary muscle
• Aortic dissection
• Aortic atherosclerosis
• Infective endocarditis
• Pericardial disease
• Prosthetic valves
• Diastolic function and dysfunction, including transmitial flow, pulmonary vein flow, tissue Doppler and color M mode
• Congenital heart disease
• Cardiomyopathy
• Contrast echo
• PISA
• Stress/Dobutamine echo
• Bernoulli formula applications including gradients, right ventricular pressure estimations
• Aortic stenosis – transvalvular velocity, gradient, AVA including continuity equation
• Aortic regurgitation – pressure half time, diastolic flow reversal in aorta
• Mitral stenosis – transvalvular gradient, pressure half time, MVA
• Mitral regurgitation – regurgitant volume, fraction, systolic flow reversals in pulmonary veins
• Hypertrophic cardiomyopathy – left ventricular intraventricular gradient
• Tricuspid regurgitation – systolic flow reversals in hepatic veins and marked dilated inferior vena cava and hepatic veins
• Wall motion score index
• Fundamentals of ultrasound physics including aliasing

Curriculum Content and Methods
Intensive independent reading with subsequent direct one-to-one instruction and corrections by an Attending Echocardiographer of studies previously read by the Fellow. This includes all inpatient, outpatient transthoracic and stress echo exams performed daily.

Performance of echocardiograms under the supervision of experienced sonographers.

Textbooks, educational videos, CD and websites that feature material on echo.

Supervision
The supervision is direct and occurs in a one-to-one basis

Evaluation Process
Fellows will be evaluated on each rotation using a competency-based reporting form on E*Value (www.e-value.net).
Fellows will be evaluated on rotation in the following manner:

Using a competency-based system, requiring completion of the goals stated above, and demonstration of familiarity with each topic in curriculum

Based on their completion of an echo conference to the division at month’s end;

Since this is a one-on-one rotation, the Fellow’s progress and development is easily tracked during the rotation and on-going feedback is provided.

Disease entities evaluated by echo:

- Left ventricular function both global and regional at rest, and during stress echo with treadmill exercise or pharmacologically.
- Valvular structure and function – native and prosthetic valve function, infection etc.
- Cardiomyopathies
- Constrictive and Restrictive pericardial disease
- Pericardial disease
- Cardiac masses
- Congenital heart disease
- Diseases of the Right heart, aorta

Doppler principles to measure intra-cardiac and intravascular blood flow velocity.

Since this rotation will be taken more than once in the course of training experience, it is expected that Fellows will demonstrate increasing competence and skill in the interpretation of echoes and ECGs.

Feedback is given daily, with a formal end of rotation evaluation.

By the end of the first year, interpretations should need to be modified only slightly and basically for purposes of fine-tuning the assessment of function and valvular performance. By the end of the second year rotations in the lab are particularly targeted at observing the Fellow functioning in a quasi independent mode, providing feedback and teaching to house staff and supervising stress tests without the need for significant attending input.

All inpatient transthoracic echoes, stress echoes and TEEs must be read/finalized by the Echo Attending within 24 hours of when echo service is performed. Preliminary reads by sonographers and/or Fellows (particularly early in their echo training) are not to be given out to requesting physicians/house staff/nurses. Urgent/stat reads must be communicated and must be read by the Fellow/echo attending.

Transthoracic reports are entered into the HeartLab digital workstation. Stress echoes and TEE reports are entered into the HeartLab workstation and Meditech. Edits to reports are made by the Fellow/attending as they read an echo study in Meditech. This ensures accuracy and timely reporting for requesting clinicians. Consultative discussions with requesting clinicians, Fellows and Echo Attendings regarding the role of the echo data is an ongoing part of the echo rotation, and provides a forum for clinical discussions and opportunities for teaching/research.
Reading List
1. Textbook of Clinical Echocardiography (Otto)
2. Echocardiography (Feigenbaum)
3. The Echo Manual (Oh, Seward, Tajik)
4. Principles and Practices of Echocardiography (Weyman)
5. Anatomic Atlases:
6. Cardiac Anatomy (Anderson, Becker)
7. Heart and Coronary Arteries (McAlpine)

ACGME Competencies for the Non-Invasive Cardiology Service Rotation

Patient Care

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Take a pertinent medical history and perform a careful and accurate physical examination with a cardiology focus for the optimal performance of an echocardiographic study.</td>
<td>DPC, AR, IL</td>
<td>AE</td>
</tr>
<tr>
<td>2. Learn the proper techniques of performing echocardiographic procedures, including transthoracic, transesophageal, and stress echocardiography.</td>
<td>DPC, DSP</td>
<td>AE, DSP</td>
</tr>
<tr>
<td>3. Know the common medications along with potential reactions and side effects of these medications given for echocardiographic procedures.</td>
<td>DPC, DSP</td>
<td>AE</td>
</tr>
<tr>
<td>4. Perform all aspects of echocardiographic procedures, including two-dimensional, color flow Doppler, pulse and continuous wave Doppler, tissue Doppler, contrast and stress echocardiography.</td>
<td>DPC, DSP</td>
<td>AE, DSP</td>
</tr>
<tr>
<td>5. Perform all procedures with emphasis on patient comfort and safety.</td>
<td>DPC, DSP</td>
<td>AE, DSP</td>
</tr>
<tr>
<td>6. Recognize and manage complications associated with echocardiographic procedures.</td>
<td>DPC, AR,</td>
<td>AE</td>
</tr>
<tr>
<td>7. Produce accurate reports of the findings of an echocardiographic exam.</td>
<td>DPC, DSP</td>
<td>AE</td>
</tr>
</tbody>
</table>

Medical Knowledge

<table>
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<th>Principal Educational Goals</th>
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</table>


1. Understand the indications, contra-indications, potential complications, and benefits for performing transthoracic, transesophageal, and stress echos.  
   
2. Learn the methods and technical aspects of two-dimensional echo, color flow Doppler, pulse and continuous wave Doppler, tissue Doppler, contrast and stress echocardiography.  
   
3. Master the echo evaluation of valvular heart disease, cardiac systolic and diastolic function, pericardial disease, cardiomyopathies, and diseases of the aorta.  
   
4. Learn the echocardiographic evaluation of congenital heart disease, infective endocarditis, cardiac masses and tumors.  
   
5. Echocardiographic evaluation of post-surgical cardiac patients including, valvular repair/replacement, and aorta repair, ventricular assist devices, pacemakers, and cardiac defibrillators.  
   
6. Access and critically evaluate current medical information and scientific evidence relevant to echocardiography.  

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<tbody>
<tr>
<td>1. Communicate effectively with patients and families in a stressful critical care environment.</td>
<td>DPC</td>
<td>AE, ECR</td>
</tr>
<tr>
<td>2. Communicate effectively with physician colleagues and members of other health care professions to assure timely, comprehensive patient care.</td>
<td>DPC</td>
<td>AE, PR, ECR</td>
</tr>
<tr>
<td>3. Communicate effectively with colleagues when reporting pertinent findings of echocardiographic studies.</td>
<td>DPC</td>
<td>AE, PR, ECR</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Principal Educational Goals</th>
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</thead>
<tbody>
<tr>
<td>1. Interact professionally toward patients, families, colleagues, and all members of the health care team.</td>
<td>DPC</td>
<td>AE, PR, ECR</td>
</tr>
<tr>
<td>2. Interacting with patients and families in a professionally appropriate manner.</td>
<td>DPC</td>
<td>AE, ECR</td>
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<tr>
<td></td>
<td>Acceptance of professional responsibility as the primary care physician for patients under his/her care.</td>
<td>DP</td>
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<tr>
<td>4.</td>
<td>Appreciation of the social context of illness.</td>
<td>DPC</td>
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<tr>
<td>5.</td>
<td>Effective utilization of ethics knowledge and consultants. This includes guidelines for CPR and DNR and end of life cardiac care.</td>
<td>DPC</td>
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</tbody>
</table>

### Practice-Based Learning and Improvement

<table>
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<tr>
<th>Principal Educational Goals</th>
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<tbody>
<tr>
<td>1. Identify and acknowledge gaps in personal knowledge and skills in performing and interpreting echocardiographic studies.</td>
<td>DPC ECR</td>
<td>AE</td>
</tr>
<tr>
<td>2. Develop real-time strategies for filling knowledge gaps that will benefit patients in the echo lab, coronary care units, or other intensive care units.</td>
<td>DPC</td>
<td>AE</td>
</tr>
<tr>
<td>3. Commitment to professional scholarship, including systematic and critical perusal of relevant print and electronic literature, with emphasis on integration of basic science with clinical medicine, and evaluation of information in light of the principles of evidence-based medicine.</td>
<td>DPC, FS</td>
<td>AE</td>
</tr>
</tbody>
</table>

### Systems-Based Practice

<table>
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<tr>
<th>Principal Educational Goals</th>
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<tbody>
<tr>
<td>1. Understand and utilize the multidisciplinary resources necessary to perform echocardiographic studies optimally on acutely ill cardiac patients.</td>
<td>DPC</td>
<td>AE</td>
</tr>
<tr>
<td>2. Collaborate with other members of the health care team to assure comprehensive care.</td>
<td>DPC</td>
<td>AE</td>
</tr>
<tr>
<td>3. Use evidence-based, cost-conscious strategies in the appropriate performance of echocardiographic studies.</td>
<td>DPC</td>
<td>AE</td>
</tr>
<tr>
<td>4. Knowing when to ask for help and advice from Senior Fellows and attending physicians.</td>
<td>DPC</td>
<td>AE, PR</td>
</tr>
<tr>
<td>5. Effective professional collaboration with residents, other Fellows, and faculty consultants from other disciplines such as Radiology and Surgery.</td>
<td>DPC,</td>
<td>AE, ECR</td>
</tr>
<tr>
<td></td>
<td>Learning by performance of echocardiographic studies, attending teaching conferences and other educational activities.</td>
<td>DPC, AR</td>
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<tr>
<td>7.</td>
<td>Effective collaboration with other members of the health care team, including residents, medical students, nurses, clinical pharmacists, occupational therapists, physical therapists, nutrition specialists, patient educators, speech pathologists, respiratory therapists, enterostomy nurses, social workers, case managers, discharge planners, and providers of home health services.</td>
<td>DPC</td>
</tr>
<tr>
<td>8.</td>
<td>Effective utilization of ethics consultants, including knowing when and how to request consultation, and how best to utilize the advice provided.</td>
<td>DPC</td>
</tr>
<tr>
<td>9.</td>
<td>Consideration of the cost-effectiveness of diagnostic and treatment strategies.</td>
<td>DPC</td>
</tr>
<tr>
<td>10.</td>
<td>Ability to lead team, including nurses, echo technicians, and stress ECG technicians.</td>
<td>DPC</td>
</tr>
<tr>
<td>11.</td>
<td>Willingness and ability to teach medical students and residents.</td>
<td>DPC</td>
</tr>
</tbody>
</table>

**Electrophysiology**

**Rotation Sites**

**Site 1: Tulane Medical Center**
Faculty: Juan Viles-Gonzalez, MD; Uzodinma Emerenini, MD

**Site 2: Southeast Louisiana Veterans Health Care System**
Faculty: Colleen Johnson, MD; Juan Viles-Gonzalez, MD; Uzodinma Emerenini, MD

**Site 3: University Medical Center New Orleans (UMCNO)**
Faculty: Colleen Johnson, MD; Juan Viles-Gonzalez, MD; Uzodinma Emerenini, MD

**Time Required**
- Year One: 1 month
- Year Two: 1 month
- Hours: Mon-Fri, 8 a.m. to 5 p.m.

**Learning Objectives and Expectations**
Fellows have compensative responsibility from day one of their training. The amount of independence allowed to the Fellow is dependent upon the attending’s judgment of the Fellow’s progress and skills level.

Fellows on this rotation are expected to learn the evaluation and management of common arrhythmias;
Learning Objectives

a. The evaluation, diagnosis and treatment of
   i. Bradyarrhythmia and tachyarrhythmia
   ii. Syncope and presyncope
   iii. Sudden cardiac death
   iv. Congenital arrhythmic diseases

b. Arrhythmia Drugs
   i. Classification
   ii. Therapeutic efficacy
   iii. Side effects

c. Ablation
   i. Indication, efficacy and complications
   ii. Mechanics

d. Devices
   i. Indications and Adverse Events
   ii. Mechanics of placement
   iii. Follow-up

e. Education
   i. EKG conference
   ii. Device Conference
   iii. Case directed literature searches

Fellows should develop rationale clinical approaches to common clinical issues unique to this field such as:

Learning Activities

- ECG, SA-ECG, Holter, and Event Recorder interpretation
- Performance of tilt table testing
- Performance of cardioversion
- Interpretation of basic intracardiac ECGs
- Interrogation and programming of permanent pacemakers, ILRs, and ICDs
- CXR interpretation (pacemakers/ICDs)
- Pertinent imaging indications/contraindications (echocardiography, CT angiography, MRI)

Curriculum Content and Methods

Instruction at the bedside, clinic, and EP lab with the attending electrophysiologist

Weekly arrhythmia conference

Weekly ECG conference

EP reading syllabus (~ 5 review articles)

Supervision

The Fellows will be supervised directly in the performance of tilt table tests, cardioversions, and
device interrogations. All consultations will be reviewed by the attending physician.

**Evaluation Process**

Fellows will be evaluated using a competency-based system on E*Value (www.e-value.net).

Following an initial interview at the outset of the rotation the Fellows will be evaluated by the EP attending at the end of each month with feedback provided periodically during the rotation. They will be specifically assessed on the rotation objectives listed above in addition to their ability to practice evidence-based medicine, maintain professional conduct, demonstrate compassionate care, recognize limitations and improve weaknesses.

**References**

Osborne Waves: Original Article by Osborne @ [http://ajplegacy.physiology.org/content/175/3/389.long](http://ajplegacy.physiology.org/content/175/3/389.long)

Accessory Pathway Location on EKG:

- Arruda, JCEP, Vol 9, 1998:2-12

**Reading List**

**PHYSIOLOGY and PATHOLOGY**


**INDICATIONS FOR TILT AND EP TESTING**


**ATRIAL FIBRILLATION**


SUPRAVENTRICULAR TACHYCARDIA


VENTRICULAR TACHYCARDIA


PACEMAKERS


ICDs


SUDDEN CARDIAC DEATH


ELECTROPHYSIOLOGY TRACINGS


ACGME Competencies for the Electrophysiology Service Rotation

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<tr>
<th>Patient Care</th>
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<tbody>
<tr>
<td><strong>Principal Educational Goals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Ability to obtain a complete medical history, perform a careful and accurate examination with emphasis on the cardiac exam, and review charts and pertinent records.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>2. Ability to write a concise evaluation, assess the cardiovascular risk of the patient and make therapeutic decisions and proper interventions based on patient preferences, scientific evidence, and sound clinical judgment.</td>
<td>DPC, CC, AR, CAC, ECG, DSP, FS</td>
<td>AE</td>
</tr>
<tr>
<td>3. Effectively evaluate and manage patients with complex cardiac arrhythmia.</td>
<td>DPC, AR, FS DSP, CC</td>
<td>AE</td>
</tr>
<tr>
<td>4. Ability to risk stratify patients after being evaluated by EP study.</td>
<td>ECG, IL, CC</td>
<td>AE</td>
</tr>
<tr>
<td>5. Ability to manage patients who have had arrhythmic disorder.</td>
<td>DPC, IL, CC, FS</td>
<td>AE, DSP</td>
</tr>
<tr>
<td>6. Effectively direct the team performing CPR and advance cardiac life support.</td>
<td>DPC, IL, CC</td>
<td>AE</td>
</tr>
<tr>
<td>7. Ability to manage complications from device implantation.</td>
<td>DPC, FS, CC</td>
<td>AE</td>
</tr>
<tr>
<td>8. Ability to understand EP study and perform pacemaker</td>
<td>DPC, AR,</td>
<td>AE</td>
</tr>
<tr>
<td>Implantation.</td>
<td>IL, CC</td>
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<tr>
<td>Participation in the interpretation of ECG, 24-hour Holter.</td>
<td>DPC, FS, ECG, AE, PR</td>
<td></td>
</tr>
<tr>
<td>Participation in all pacemaker and ICD follow-up and programming using the proper technique and under the supervision of a teaching faculty.</td>
<td>DPC, FS, EP, AE, DSP</td>
<td></td>
</tr>
</tbody>
</table>

**Medical Knowledge**

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<th>Principal Educational Goals</th>
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<tbody>
<tr>
<td>1. Familiarity with the newest basic science concepts and mechanisms of cardiac electrophysiology.</td>
<td>CC, RC, JC</td>
<td>AE, ECR</td>
</tr>
<tr>
<td>2. Familiarity with current medical literature, clinical trials, and evidence based medicine in cardiac electrophysiology.</td>
<td>JC, CC</td>
<td>AE</td>
</tr>
<tr>
<td>3. Familiarity with the broad spectrum of cardiac electrophysiology.</td>
<td>CC</td>
<td>AE, ECR</td>
</tr>
<tr>
<td>4. Familiarity with the pathophysiology of cardiovascular medicine.</td>
<td>CC, JC, AR</td>
<td>AE, DSP</td>
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</table>

**Interpersonal Skills and Communication**

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
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</thead>
<tbody>
<tr>
<td>1. Communicate effectively the consult findings with physician colleagues and other members of the health care team in a timely fashion to assure a comprehensive patient care.</td>
<td>DPC, AR</td>
<td>AE, PR</td>
</tr>
<tr>
<td>2. Present professional findings to patient and family members in a compassionate and informative manner.</td>
<td>DPC, AR</td>
<td>AE, PR</td>
</tr>
<tr>
<td>3. Provide educational instructions and other learning tools to patients to reinforce behavioral modification.</td>
<td>DPC, AR</td>
<td>AE, PR</td>
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</table>

**Professionalism**

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<tr>
<th>Principal Educational Goals</th>
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<tbody>
<tr>
<td>1. Interact professionally with patients, patients' family, colleagues, and other members of the health care team.</td>
<td>DPC, AR</td>
<td>AE, PR</td>
</tr>
<tr>
<td>2. Appreciation of the spiritual and social context of wellness and</td>
<td>DPC, AR</td>
<td>AE</td>
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</tbody>
</table>
### Practice-Based Learning and Improvement

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
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<tbody>
<tr>
<td>1. Commitment to scholarship and the use of evidence based cardiovascular medicine.</td>
<td>JC, RC</td>
<td>PR</td>
</tr>
<tr>
<td>2. Broad reading of the cardiovascular literature and access and research of Medline and Internet tools.</td>
<td>JC, RC</td>
<td>PR</td>
</tr>
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</table>

### Systems-Based Practice

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<tr>
<th>Principal Educational Goals</th>
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<tbody>
<tr>
<td>1. Understand the complexities of cardiovascular disease patients and utilize the multidisciplinary resources necessary to care for them.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>2. Collaborate with other member of the health care team to assure comprehensive cardiac care.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>3. Understand the system complexities in electrophysiology.</td>
<td>DPC, AR, GR</td>
<td>AE</td>
</tr>
<tr>
<td>4. Willingness to learn by participation in ward rounds, teaching conferences and other educational activities.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>5. Effective utilization of risk stratification using evidence-based medicine.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>6. Develop effective communication with referring physician, health care team, patient and their family, regarding purpose and findings of the EP test.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>7. Expand learning in reading ECG and 24-holter on daily basis.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>8. Consideration of cost effectiveness and outcome measurements of tests and interventions associated with EP study and device implantation</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
</tbody>
</table>

### Nuclear Cardiology

**Rotation Sites**

*Site 1: Tulane Medical Center*

Faculty: Keith Ferdinand, MD; Rohan Samson, MD; Gholam Ali, MD; Asif Anwar, MD; Anand
Time Required
- Year One: 1 month
- Year Two: 1 month
- Year Three: 1 month
- Hours: Mon-Fri, 8 a.m. to 5 p.m.

Learning Objectives and Expectations
Fellows have considerable responsibility from day one of their training. The amount of independence allowed to the Fellow is dependent upon the attending’s judgment of the Fellow’s progress and skills level.

Training in nuclear cardiology provides Fellows with an understanding of the indications for specific nuclear cardiology tests, the safe use of radionuclides, and the basics of instrumentation and image processing. Fellows will also become experienced in methods of quality control, image interpretation, and integration of risk factors, clinical symptoms and stress testing and the appropriate application of the resultant diagnostic information for clinical management.

The goal for the nuclear cardiology experience is to achieve competence in exercise testing and to gain the general training in nuclear cardiology needed for the practice of consultative cardiology. During the rotation, the Fellows are expected to participate in all aspects of nuclear testing.

Fellows will also be instructed in and will be expected to gain knowledge in the area of Nuclear Cardiology, specifically in the following areas: see text references below for additional information on the following:
- Safety in Handling Radionuclides
- Preparation of Radionuclide Tracers
- Calibration and Maintenance of Nuclear Equipment
- Image acquisition
- Data Processing
- Image Interpretation
- Ongoing Research in Cardiology Involving Nuclear Techniques

Fellows will rotate through the nuclear laboratory for a minimum of three months during their fellowship and are required to actively interpret and report a minimum of 300 nuclear cardiology studies to graduate. On a routine basis, angiographic and/or CTA findings (when available) are correlated with each nuclear study performed.

Those fellows who desire Level II certification are given the option of rotating through the nuclear lab for an additional one to two months. Fellows desiring advanced training will be required to have hands-on experience with a minimum of 40 directly supervised patients, including at least 10 radionuclide angiography studies. They receive a minimum of 620 hours of radiation safety work
experience during their training in the clinical environment of the nuclear cardiology lab. An additional 80-hour course in radioactive materials physics, safety, and handling is required; this course is obtained through independent vendors and is the personal responsibility of the individual fellow. Fellows receive instruction in elution of isotopes, isotope labeling, and isotope preparation for clinical use by rotating through the institution’s contracted radiopharmacy.

**Learning Activities**

Fellows will learn the safe handling of radioisotopes, ALARA principles, proper administration of radioisotopes for diagnostic procedures, equipment quality control, and image processing.

Fellows will perform or assist in the performance in many of the exercise tests, which involve vital signs and EKG interpretation, determination of the adequacy of the study and its endpoint, monitoring the patient during recovery and handling and injecting the radioisotopes.

Fellows will be expected to interpret and understand the clinical data, including the history, exam, resting and stress EKGs and exercise data, reviewing and discussing them with the attending. The Fellow is expected to develop an understanding of the concepts of sensitivity, specificity, and accuracy in the interpretation of these tests.

Fellows will also be expected to learn the following:

- Basic operation and quality control of gamma cameras and computers.
- Principles of patient selection, performance, monitoring, interpretation, and reporting of exercise and pharmacological stress testing.
- How to acquire, reconstruct and analyze radionuclide ventriculography (RVG) and nuclear perfusion images (NPI).
- Cardiac PET imaging is not performed in our institution. A detailed topic review is provided on PET physics and theory, PET tracers, perfusion imaging, and FDG viability imaging

**Curriculum Content and Methods**

Fellows are required to attend the weekly Non-Invasive Imaging Conference (Echo/Nuclear) consisting of didactic lectures on selected topics, fellow-driven clinical case presentations, and invasive/non-invasive imaging correlations. In addition, there are 9 faculty lectures in the Core Curriculum which rotate through the 3-year program:

- Introduction to Nuclear Physics
- Nuclear Cardiology Instrumentation
- Basics of Nuclear Stress Testing
- Intro to Nuclear Cardiology Interpretation
- Radiopharmaceuticals: Production and Properties
- Radiation Safety
- Risk Stratification
- Recognition of Nuclear Artifacts
- Myocardial Viability/PET

Fellows will receive direct instruction from the attending physician with additional instruction in certain procedures by qualified technicians on service. Fellows are encouraged to refer to the text:
Principles and Practice of Nuclear Medicine, 2nd edition, 1995, by Early and Sodee and to the full Reading List for reference in the following subjects:

- Safety in Handling Radionuclides
- Checking for contamination
- Use of film badges
- Precautions necessary for drawing, handling, and administering doses to patients
- Preparation of Radionuclide Tracers
- Use of dose calibrator
- Red cell labeling with Tc-99m
- Calibration and Maintenance of Nuclear Equipment
- Calibration schedules for each device
- Gamma camera
- Uniformity calibration
- Center of rotation assessment
- TAC (attenuation correction) gantry calibrations (see SMV manual)
- Dose calibrator and survey instruments
- Image acquisition
- Planar acquisition
- Gated acquisition
- Tomographic acquisition
- Data Processing
- Gated blood pool
- Ejection fraction
- Regional wall motion and emptying/filling rates
- Left ventricular volume, rest and exercise
- Tomography
- Filtered back projection
- Reconstruction
- Cardiac orientation
- Motion correction
- Resolution recovery filtering
- Transmission attenuation correction
- Cedars-Sinai commercial programs QGS, QPS (Entegra QGS/QPS Help)
- Image Interpretation
- Gated blood pool scans
- Left and right ventricular size and function
- Regional wall motion
- Non-cardiac structures
- Perfusion scans
- Perfusion defects and common artifacts
- “High risk” anatomy, transient ischemic dilatation, high lung uptake
- Effects of attenuation correction (on line source)
- Gated SPECT (on line source)
- Ongoing Research in Cardiology Involving Nuclear Techniques
- Screening for occult CAD
• Effect of aging on LV function
• Vascular resistance and remodeling after acute infarction
• Drug trials in heart failure
• Gene therapy to increase perfusion
• No reflow and reperfusion injury in acute infarction

**Supervision**
All procedures are done under the direct supervision of the attending physician, or the qualified nuclear technician on the case.

**Evaluation Process**
Fellows will be evaluated on each rotation using a competency-based system on E*Value (www.e-value.net).

**Reading List**
1. Nuclear Medicine Physics: The Basics; *Ramesh Chandra*
2. Nuclear Cardiology: Practical Applications; *Heller and Hendel*
3. Clinical Nuclear Cardiology; *Zaret and Beller*
4. Principles and Practice of Nuclear Medicine; *Early and Sodee*
5. [www.asnc.org](http://www.asnc.org)
6. Cardiosource
7. Nuclear Cardiology, The Basics: *Wackers, Bruni, and Zaret*

**ACGME Competencies for the Nuclear Cardiology Service Rotation**

*Patient Care*

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ability to obtain a complete medical history, perform a careful and accurate examination with a cardiology focus for the optimal performance of stress test and nuclear cardiology.</td>
<td>DPC, AR, ECG</td>
<td>AE</td>
</tr>
<tr>
<td>2. Learn proper techniques of performing nuclear procedures, including chemical procedures.</td>
<td>DPC, DSP, ECG</td>
<td>AE, DSP</td>
</tr>
<tr>
<td>3. Understand nuclear physics and radiation safety.</td>
<td>CC</td>
<td>AE</td>
</tr>
<tr>
<td>4. Ability to risk stratify patients after being evaluated by cardiac stress test and nuclear cardiovascular procedures. Ability to correlate invasive and nuclear studies.</td>
<td>ECG, CAC, CC</td>
<td>AE</td>
</tr>
<tr>
<td>5.</td>
<td>Ability to manage patients who have had stress test and nuclear test.</td>
<td>DPC, CAC, CC, FS</td>
</tr>
<tr>
<td>6.</td>
<td>Ability to perform all procedures with emphasis on patient comfort and safety</td>
<td>DSP</td>
</tr>
<tr>
<td>7.</td>
<td>Ability to manage complications from stress test and nuclear studies, including nuclear decontamination procedures.</td>
<td>DPC, FS, CC</td>
</tr>
<tr>
<td>8.</td>
<td>Ability to understand nuclear safety for patients and health care workers.</td>
<td>DPC, CC</td>
</tr>
<tr>
<td>9.</td>
<td>Ability to generate accurate test reports.</td>
<td>DSP, CC</td>
</tr>
</tbody>
</table>

### Medical Knowledge

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Understand the newest basic science concepts and mechanisms in nuclear cardiology.</td>
<td>CC, RC, JC</td>
<td>AE, ECR</td>
</tr>
<tr>
<td>2. Familiarity with current medical literature, clinical trials, and evidence based medicine in nuclear cardiology.</td>
<td>JC, CC</td>
<td>AE</td>
</tr>
<tr>
<td>3. Learn the methods and technical aspects of cardiac stress tests SPECT nuclear cardiology, PET scan, and MRI/MRA</td>
<td>CC, PR</td>
<td>AE, ECR</td>
</tr>
<tr>
<td>4. Master the nuclear evaluation of patients with coronary artery disease, including reversible ischemia and myocardial viability.</td>
<td>CC, DSP, PR</td>
<td>AE, ECR</td>
</tr>
</tbody>
</table>

### Interpersonal Skills and Communication

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Communicate effectively the risk and benefits of the procedure to the patient before obtaining consent for the procedure.</td>
<td>DPC, FS</td>
<td>AE, ECR</td>
</tr>
<tr>
<td>2. Provide professional presentation of nuclear findings to patient and family members in a compassionate and informative manner. Provide complete and accurate report to consulting physician.</td>
<td>DPC</td>
<td>AE, PR, ECR</td>
</tr>
<tr>
<td>3. Provide educational instructions and other learning tools to patients to reinforce behavioral modification.</td>
<td>DPC, PC</td>
<td>AE, PR, ECR</td>
</tr>
</tbody>
</table>

### Professionalism

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning</th>
<th>Evaluation</th>
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</thead>
<tbody>
<tr>
<td>Activities</td>
<td>Methods</td>
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</tr>
<tr>
<td>Interact professionally with patients, patients’ families, colleagues, and other members of the health care team.</td>
<td>DPC, AR, PC, AE, PR, ECR</td>
<td></td>
</tr>
<tr>
<td>Appreciation of the cultural, spiritual and social context of wellness and illness.</td>
<td>DPC, AR, AE</td>
<td></td>
</tr>
</tbody>
</table>

**Practice-Based Learning and Improvement**

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify and acknowledge gaps in personal knowledge and skills in performing and interpreting nuclear cardiology studies.</td>
<td>DPC, NC, CC</td>
<td>AE</td>
</tr>
<tr>
<td>Commitment to scholarship and the use of evidence based nuclear cardiology.</td>
<td>JC, RC, CC</td>
<td>FP, PR</td>
</tr>
<tr>
<td>Broad reading of the cardiovascular literature and access and research of Medline and Internet tools.</td>
<td>JC, RC, CC</td>
<td>FP, PR</td>
</tr>
</tbody>
</table>

**Systems-Based Practice**

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand and utilize the multidisciplinary resources necessary to perform nuclear studies on acutely ill cardiac patients.</td>
<td>DPC, PC</td>
<td>AE</td>
</tr>
<tr>
<td>Collaborate with other members of the health care team to assure comprehensive cardiac care.</td>
<td>DPC, PC</td>
<td>AE</td>
</tr>
<tr>
<td>Understand the system complexities in nuclear cardiology.</td>
<td>DPC, AR, GR</td>
<td>AE</td>
</tr>
<tr>
<td>Use evidence-based cost conscious strategies in the appropriate performance of nuclear studies.</td>
<td>DPC</td>
<td>AE</td>
</tr>
<tr>
<td>Knowing when to ask for help and advice from senior Fellows and attending physicians.</td>
<td>DPC</td>
<td>AE, PR</td>
</tr>
<tr>
<td>Effective professional collaboration with residences other Fellows, and faculty consultants from radiology and surgery.</td>
<td>DPC, PC</td>
<td>AE, ECR</td>
</tr>
<tr>
<td>Develop effective communication with referring physician, health care team, patient and their family, regarding purpose and findings of the nuclear test.</td>
<td>DPC, PC</td>
<td>AE</td>
</tr>
<tr>
<td>Expand learning while reviewing nuclear images on daily basis.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
</tbody>
</table>
9. Consideration of outcome measurements of tests and interventions associated with nuclear studies.

**Cardiology Vascular Disease**

**Rotation Sites**

*Site 1: Tulane Medical Center*
  
  Faculty: Gholam Ali, MD

*Site 2: Southeast Louisiana Veterans Health Care System*
  
  Faculty: Gholam Ali, MD

**Time Required**

- Year One: 1 month
- Year Two: 1 month
- Year Three: 1 month
- Hours: Mon-Fri, 8 a.m. to 5 p.m.

**Learning Objectives and Expectations**

To provide Fellows with a core curriculum in all aspects of atherosclerotic vascular disease (ASVD, cardiovascular, cerebrovascular, and peripheral arterial disease) management and risk assessment that will prepare he/she for the Cardiovascular Boards and to enrich their Cardiology training at Tulane University.

To obtain a thorough understanding of the guidelines for lipid management, blood pressure control, and diabetes management (NCEP, JNC VII, ADA, ACC/AHA policy statements)

Understand the role of traditional and novel risk factor assessment in cost-effective preventive care.

Learn how to accurately assess a person’s risk for developing cardiovascular disease using the available risk prediction models.

Review the latest recommendations for behavior and lifestyle modification (diet, exercise, weight loss, and smoking cessation) in reducing the risk of CVD.

Learn how to decide between interventional and medical management of vascular disease and when to do both simultaneously.

Understand how to interpret the results of atherosclerosis imaging and to apply to results to improve CVD risk assessment.

Review the optimal medical and interventional management strategies to decrease the risk of future cerebrovascular events.

*“Prevention” Includes the Following Subject Areas*

- Atherosclerosis/Subclinical and Overt
- Blood Pressure – primary and secondary causes
• Cholesterol Disorders
• Cardiac Rehabilitation
• Coronary CT (EBCT/MDCT)
• Cigarette Smoking
• Diabetes
• Diet
• Endothelial function/dysfunction
• Family History
• Genetics of Atherosclerosis/SCD
• Hormone Replacement Therapies/Gender Differences
• Peripheral Arterial Disease
• Risk Stratification
• Risk Factor Modification
• Thrombosis

**Duties of the Fellow**
To attend clinical sessions with the Attendings at least twice a week. This rotation is concurrent with the Cardiac Rehabilitation rotation.

**ACGME Competencies for the Cardiology Vascular Disease Rotation**

*Patient Care*

<table>
<thead>
<tr>
<th>Principle Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To perform a complete evaluation of the patient with focus on cardiovascular prevention</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>2. Write a concise progress notes with emphasis in Return to Work, limitation of physical activities, behavior modification and education and long term management plan as well as referral to other areas of the subspecialty.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>3. Ability to write concise, accurate, informative, and helpful consultation notes outlining the recommendation and explaining the rational.</td>
<td>CC, DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>4. Ability to interpret electrocardiographic stress test, rhythm strips, oxygen consumption, body fat evaluation.</td>
<td>DPC, AR, CC</td>
<td>AE, DSP</td>
</tr>
<tr>
<td>5. Ability to recognize any arrhythmias as well as exercise induced arrhythmias.</td>
<td>DPC, AR</td>
<td>AE, DSP</td>
</tr>
<tr>
<td>6. Ability to educate and counsel patients on risk factor prevention and lifestyle changes to reduce the risk of cardiovascular disease.</td>
<td>DPC, AR</td>
<td>AE, PR</td>
</tr>
<tr>
<td></td>
<td>Ability to diagnose and treat important cardiovascular complications occurring after Percutaneous cardiovascular interventions, surgery, or placement of devices, including LVAD, AICD, and other vascular intervention.</td>
<td>DPC, AR, CC, CAC, IL</td>
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<tr>
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</tr>
<tr>
<td>8.</td>
<td>Ability to establish rehabilitation program and return to work conditions for patients with congestive heart failure, cardiac transplantation, or major surgical procedures.</td>
<td>DPC, AR, CC</td>
</tr>
<tr>
<td>9.</td>
<td>Ability to treat and help patients with noncardiac complications including neuromuscular diseases and cerebrovascular complications.</td>
<td>DPC, AR, CC</td>
</tr>
<tr>
<td>10.</td>
<td>Ability to educate patients in diet modification, behavior modification, tobacco cessation, and stress management.</td>
<td>DPC</td>
</tr>
</tbody>
</table>

**Medical Knowledge**

<table>
<thead>
<tr>
<th>Principle Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Familiarity with the effects of the risk factors on vascular biology on the heart and blood vessels.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>2. Familiarity with the management of patients during out-patient surgical and interventional follow-up.</td>
<td>DPC, AR, CAC, CC, DSP</td>
<td>AE, DSP</td>
</tr>
<tr>
<td>3. Familiarity with the use of clinical epidemiology, biostatistics, clinical trials, and out-come research.</td>
<td>CC, JC, RC</td>
<td>AE</td>
</tr>
<tr>
<td>4. Familiarity with strategies for diagnosis and treatment of hypertension.</td>
<td>CC, DPC</td>
<td>AE</td>
</tr>
<tr>
<td>5. Familiarity with the diagnosis and treatment of primary and secondary Dyslipidemia.</td>
<td>DPC, CC, JC</td>
<td>AE</td>
</tr>
<tr>
<td>7. Familiarity with the management of the smoking cessation and nicotine addiction.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>8. Familiarity with phase I through phase IV of cardiac rehabilitation and return-to-work recommendations.</td>
<td>DPC, AR, CC</td>
<td>AE</td>
</tr>
<tr>
<td>9. Familiarity with principle of exercise physiology and oxygen consumption.</td>
<td>CAC, CC, IL</td>
<td>AE</td>
</tr>
<tr>
<td></td>
<td>Principle Educational Goals</td>
<td>Learning Activities</td>
</tr>
<tr>
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</tr>
<tr>
<td>10.</td>
<td>Familiarity with principle of nutrition and its effect on the cardiovascular system.</td>
<td>DPC, AR, AE</td>
</tr>
<tr>
<td>11.</td>
<td>Familiarity with psychosocial, behavioral, and stress management aspect of cardiovascular diseases.</td>
<td>DPC, AR AE PR</td>
</tr>
<tr>
<td>12.</td>
<td>Familiarity with diagnosis and treatment of peripheral vascular disease and rehabilitation.</td>
<td>DPC, DSP, CAC, CC</td>
</tr>
</tbody>
</table>

**Interpersonal Skills and Communication**

<table>
<thead>
<tr>
<th>Principle Educational Goals</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1. Communicate effectively the consult findings with physician colleagues and other members of the health care team in a timely fashion to assure a comprehensive patient care.</td>
<td>DPC, AR AE PR</td>
<td></td>
</tr>
<tr>
<td>2. Present professional findings to patient and family members in a compassionate and informative manner.</td>
<td>DPC, AR AE PR</td>
<td></td>
</tr>
<tr>
<td>3. Provide educational instructions and other learning tools to patients to reinforce behavioral modification.</td>
<td>DPC, AR AE PR</td>
<td></td>
</tr>
</tbody>
</table>

**Professionalism**

<table>
<thead>
<tr>
<th>Principle Educational Goals</th>
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<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Interact professionally with patients, patients’ family, colleagues, and other members of the health care team.</td>
<td>DPC, AR AE PR</td>
<td></td>
</tr>
<tr>
<td>2. Appreciation of the spiritual and social context of wellness and illness.</td>
<td>DPC, AR AE PR</td>
<td></td>
</tr>
</tbody>
</table>

**Practice-Based Learning and Improvement**

<table>
<thead>
<tr>
<th>Principle Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Commitment to scholarship and the use of evidence-based preventive cardiology and rehabilitation.</td>
<td>DPC RC AE ECR</td>
<td></td>
</tr>
<tr>
<td>2. Broad reading of the cardiovascular literature with emphasis on primary and secondary prevention, wellness, and cardiac rehabilitation.</td>
<td>JC, RC, GR AE ECR</td>
<td></td>
</tr>
</tbody>
</table>
Systems-Based Practice

<table>
<thead>
<tr>
<th>Principle Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Understand the complexities of patient care by a cardiac rehabilitation team and how this interaction affects the health of the patient and the community at large.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
<tr>
<td>2. Consideration of cost effectiveness of rehabilitation and prevention and outcome measurements strategies.</td>
<td>DPC AR</td>
<td>AE</td>
</tr>
<tr>
<td>3. Understanding of the system complexities in cardiovascular prevention and rehabilitation.</td>
<td>DPC</td>
<td>AE</td>
</tr>
<tr>
<td>4. Knowing how to partner with a team of health care providers to assess, coordinate, and improve the cardiac rehabilitation and preventive health care system.</td>
<td>AR</td>
<td>AE, PR</td>
</tr>
<tr>
<td>5. Willingness and ability to teach medical students, residents, and other health care professionals involved in patient care or system activities.</td>
<td>DPC</td>
<td>AE, PR</td>
</tr>
</tbody>
</table>

Potential Subject Areas to Review in ACC SAP

We will focus on comprehensive risk factor modification from a medical and lifestyle point of view. The following areas that we would like to cover during the rotation:

- Optimal management of Dyslipidemia (elevated LDL, low HDL, or high triglycerides, and mixed dyslipidemias) – To understand the rationale behind the NCEP guidelines and learn how to better implement their recommendations. Review the clinical trials using statins, fibrates, resins, niacin, and cholesterol absorption inhibitors.
- Risks and Benefits of hormone replacement therapy – Review the data from HERS, HERS II, WHI, and other clinical trials as well as the epidemiological and mechanistic data involving
- HRT and cardiovascular disease risk.
- Cost-effective diagnostic screening strategies for CHD and PAD.
- Review of basic statistical techniques used in the preventive cardiology literature.
- Interventions for smoking cessation.
- Role of psychosocial factors in the development of atherosclerotic vascular disease and how to manage them.
- Cost-effectiveness of medical and lifestyle preventive strategies.
- Development of exercise prescriptions and management of a cardiac rehabilitation program as well as a peripheral arterial disease rehabilitation program.
- Work-up and management of renovascular hypertension and other secondary causes of
hypertension.

- Applications of coronary calcium scanning, cardiac MRI, MRA of the carotids, aorta, and lower extremities and carotid ultrasound/IMT. CT angiography of the coronaries is an area of emerging interest.
- Appropriate evaluation of and management of peripheral arterial disease and carotid atherosclerosis – ABIs, MRA, and ultrasound techniques.
- Techniques to assess endothelial function and vascular compliance – e.g. brachial artery testing, pulse wave velocity.
- Genetics of vascular disease (genetic polymorphisms for hypertension, arterial thrombosis, and venous thrombosis).
- Mediators of CAD and PAD progression (inflammation, infection, plaque stability and vulnerability).
- Management of obesity (pharmacologic treatment and lifestyle modification).
- Pathophysiology of atherosclerotic vascular disease.
- Interventional and medical options for the management of peripheral arterial disease.
- Approaches to the patient with severe CHD who is deemed a poor candidate for revascularization (gene therapy, PMR/TMR, external counterpulsation treatment).
- Strategies to improve adherence and compliance with lifestyle modification and medical therapy.
- Calculation of CVD risk appraisal based on Framingham Study and the PROCAM study.

**Congestive Heart Failure**

**Rotation Sites**

*Site 1: Tulane Medical Center*
  Faculty: Thierry Le Jemtel, MD; Abhishek Jaiswal, MD

*Site 2: Southeast Louisiana Veterans Health Care System*
  Faculty: Thierry Le Jemtel, MD

*Site 3: University Medical Center New Orleans (UMCNO)*
  Faculty: Thierry Le Jemtel, MD; Abhishek, Jaiswal, MD

**Time Required**

- Year One: 1 month
- Year Two: 1 month
- Hours: Mon - Sat, 8 a.m. to 5 p.m.

**ACGME Competencies for the Congestive Heart Failure and Heart Transplant Rotation**

**Patient Care**

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
</table>
1. Ability to obtain a complete medical history, perform a careful and accurate examination with emphasis on the cardiac exam, and review charts and pertinent records.  
   DPC, AR, IL  
2. Ability to write a concise evaluation, assess the cardiovascular risk of the patient and make therapeutic decisions and proper interventions based on patient preferences, scientific evidence, and sound clinical judgment.  
   DPC, AR, CAC, ECG, DSP, IL  
3. Effectively evaluate and manage patients with complex cardiac illnesses, particularly, congestive heart failure, ventricular assist device and cardiac transplantation patients.  
   DPC, AR, FS, CAC, DSP, CC  
4. Ability to risk stratify patients after being evaluated by echocardiography, cardiac stress test, coronary angiograms, nuclear cardiovascular procedures and other invasive and non-invasive procedures.  
   ECG, CAC, IL, CC  
5. Ability to manage patients who have had left and right catheterization, heart transplantation and devices.  
   DPC CAC, CC, FS  
6. Effectively direct the team performing CPR and advance cardiac life support in heart failure and transplant service.  
   DPC, IL  
7. Ability to manage complications from invasive and heart transplantation related procedures.  
   DPC, FS, CAC, IC  
8. Ability to participate in behavior modification and strategies to educate patients and other health professionals in the management of heart transplant and heart failure.  
   DPC, AR  
   DPC, FS  
10. Participation in all non-invasive and invasive cardiovascular procedures using the proper technique and under the supervision of a teaching faculty. Observe heart transplantation operation and organ procurement.  
   DPC, FS  

**Medical Knowledge**

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Familiarity with the newest basic science concepts and mechanisms of heart failure and transplantation.</td>
<td>CC, RC JC</td>
<td>AE, ECR</td>
</tr>
<tr>
<td>2. Familiarity with current medical literature, clinical trials, and</td>
<td>IL, JC, CC</td>
<td>AE</td>
</tr>
</tbody>
</table>
Interpersonal Skills and Communication

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Communicate effectively the consult findings with physician colleagues and other members of the health care team in a timely fashion to assure a comprehensive patient care.</td>
<td>DPC, AR</td>
<td>AE, PR</td>
</tr>
<tr>
<td>2. Present professional findings to patient and family members in a compassionate and informative manner.</td>
<td>DPC, AR</td>
<td>AE, PR</td>
</tr>
<tr>
<td>3. Provide educational instructions and other learning tools to patients to reinforce behavioral modification.</td>
<td>DPC, AR</td>
<td>AE, PR</td>
</tr>
</tbody>
</table>

Professionalism

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Interact professionally with patients, patients’ family, colleagues, and other members of the health care team.</td>
<td>DPC, AR</td>
<td>AE, PR</td>
</tr>
<tr>
<td>2. Appreciation of the cultural, spiritual and social context of wellness and illness.</td>
<td>DPC, AR</td>
<td>AE</td>
</tr>
</tbody>
</table>

Practice-Based Learning and Improvement

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Commitment to scholarship and the use of evidence based cardiovascular medicine.</td>
<td>JC, RC, AR</td>
<td>FP, PR</td>
</tr>
<tr>
<td>2. Broad reading of the cardiovascular literature and access and research of Medline and internet tools.</td>
<td>JC, RC, AR</td>
<td>FP, PR</td>
</tr>
</tbody>
</table>

Systems-Based Practice

<table>
<thead>
<tr>
<th>Principal Educational Goals</th>
<th>Learning Activities</th>
<th>Evaluation Methods</th>
</tr>
</thead>
</table>
1. Understand the complexities of cardiovascular disease patients and utilize the multidisciplinary resources necessary to care for them.  
2. Collaborate with other members of the health care team to assure comprehensive cardiac care.  
3. Understand the system complexities in invasive and noninvasive cardiology.  
4. Willingness to learn by participation in ward rounds, teaching conferences and other educational activities.  
5. Effective utilization of risk stratification using evidence-based medicine.  
6. Develop effective communication with referring physician, health care team, patient and their family, regarding purpose and findings of the consult.  
7. Expand learning in outpatient ultrasound and nuclear cardiology to optimize understanding of patients risk stratification.  
8. Consideration of cost effectiveness and outcome measurements of tests and interventions associated with consultations.

Objectives and Expectations  
This is an advanced rotation (Year 3) in the management of patients with acute and chronic heart failure due to a variety of causes. Management of patients with advanced heart failure, including heart transplantation, will be covered. The duration of this rotation will be 2 consecutive months. By the end of the rotation you should be able to:

Demonstrate an advanced understanding of the causes of heart failure.

Appropriately evaluate and manage patients with cardiomyopathy (dilated, hypertrophic and restrictive) in the inpatient and outpatient settings.

Demonstrate an advanced understanding of the pathophysiology of heart failure at the basic science level including molecular changes and adaptations.

Treat patients with acute and chronic heart failure in both the inpatient and outpatient settings including special populations such as peripartum cardiomyopathy and diastolic dysfunction.

Treat patients with advanced heart failure including, hemodynamically tailored therapy, biventricular pacing and LVAD utilization.

Care for patients undergoing heart transplantation including indications and contraindications, perioperative management of donors and recipients and long-term management including rejection, infection, and accelerated graft arteriosclerosis.
Gradually assume Attending duties on the Congestive Heart Failure Service.
Gradually provide consultative care for patients referred by other physicians for management of these same conditions.
Provide end-of-life care for patients without other options
Produce evidence of scholarly productivity in the fields of cardiomyopathy, heart failure or heart transplantation at a clinical or basic science level.

**Learning Activities**
Right heart catheterization and endomyocardial biopsy.
History and physical examination of patients with heart failure.
Interpretation of endomyocardial biopsy including cardiomyopathies and rejection.
Cardiopulmonary exercise stress testing.
Attending responsibilities for the Service.
End-of-life care for end-stage patients without options.

**Curriculum Content and Methods**
The content is learned through active participation on the clinical service.
Heart transplant meetings.
Performance of endomyocardial biopsies.
Review of endomyocardial biopsy specimens.
Outside reading of appropriate ACC/AHA Guidelines.
Outside reading of Heart and Lung Transplantation by Baumgartner, Reitz, Kasper and Theodore.
Participation in heart transplant procedures including evaluation of donor and recipient operation.

**Supervision**
You are supervised by the Procedure Attending for cases in the catheterization lab and by the Service Attending in all other circumstances.

**Evaluation Process**
(Fellows will be evaluated on each rotation using a competency-based system on E*Value (www.e-value.net)).
You will be evaluated by the Procedure Attendings in the catheterization laboratory regarding procedural skills. You will be evaluated by the Attending on the Service regarding clinical skills not related to the catheterization laboratory. The Attendings will evaluate what you do as you care for patients and provide immediate feedback through discussion. Specifically, you will be evaluated on the following areas:
Your ability to perform right heart catheterization and endomyocardial biopsy and your knowledge of
the indications and complications. The Attending will be present for the entire case and question you before, during and after the case.

Your understanding of the diagnosis, evaluation and management of patients with heart failure and cardiomyopathy. You will be evaluated by the Attending through your discussion of cases and care of patients. Advanced knowledge is expected.

Your understanding of the management of patients following heart transplantation.

Endomyocardial biopsy interpretation including recognition of various cardiomyopathies. The Service Attending will evaluate you during the daily review of endomyocardial biopsies.

**Reading List**


**Research Rotation**

**Project Requirements and Mentoring**

The Cardiology Fellows are required to participate in either basic or clinical research. The research endeavor should facilitate the development of critical thinking and analysis. Fellows are encouraged to enlist the guidance and support of cardiology faculty members in the design, implementation and analysis of their research project.

Each Fellow must complete one project before becoming board eligible.

Submission of abstracts or manuscripts is expected of all Fellows.

Each Fellow will send an outline of at least two projects of interest to the Program Director.

By the middle of the first year of Fellowship, all Fellows will have initiated at least one of the projects outlined in the letter to the Program Director.

**Research Objectives**

Near the conclusion of their first year, Fellows are asked to select a research mentor, decide on a
research project and prepare a formal research protocol. Fellows will perform their research with a member of the Cardiology faculty. Early in the second year, the Fellows are asked to give a ten-minute oral presentation of their proposed project to the clinical faculty and Fellows. Feedback by the faculty is given to ensure a productive research experience.

Active participation in research will provide the trainee with experience in critical thinking, and in evaluating the cardiology literature. This experience is essential in providing a solid foundation in clinical cardiovascular medicine.

**Rotation Sites**

*Southeast Louisiana Veterans Health Care System*

Faculty: as arranged (Anand M. Irimpen, MD – Chief of Cardiology)

**Time Required**

Time frame: 1~2 months clinical or basic research

**Objectives and Expectations**

The Tulane University Section of Cardiology provides the opportunity to engage in academic pursuits through dedicated research time. This is an integral aspect of the Fellowship program whose primary objectives include:

- fostering intellectual scientific curiosity and critical thinking;
- providing the skills (e.g., grant application process, evaluation of scientific literature) and knowledge necessary to design and conduct independent research that are congruous with IRB, HIPAA and established bioethical standards;
- allowing for career development through a close mentoring relationship with an experienced faculty investigator.

All Fellows engaged in research are expected to:

- identify a mentor who is a full-time faculty investigator with experience in trainee development in their first year of training;
- develop a clinical or basic science research project under close supervision of the mentor and with careful consideration for logistical feasibility;
- participate fully through the presentation of abstracts or papers at local and nationally-recognized scientific meetings and preparation of manuscripts for publication in peer-reviewed journals;
- present the research plan and results to the Division faculty;
- conduct research activity that is in concert with the highest bioethical standards.

**Learning Activities**

The trainee will develop skills in the following areas:

- Literature study, to ascertain the exact state of knowledge before undertaking a new investigation.
- Formulation of hypothesis and specific goals, ensuring that the hypothesis is testable, that the goals are appropriate and statistical power is achievable.
- Development of the research plan and the protocol, including study design, recruitment of subjects,
ethical considerations, informed consent and protection of privacy, data collection modes, full
description of procedures and institutional approval of human investigation, where appropriate.

Data collection, including preparation of routine data forms.

Development of analytic methods or procedural skills, as required, and particularly the handling of
artifacts, missing data, outliers and statistical inference.

Presentation of results, preferably both oral and written, emphasizes that no investigation is complete
until it is reported in peer-reviewed journals.

Risk-benefit analysis, regarding both patient (subject) risk and benefit and societal risk and benefit.

**Curriculum Content and Methods**
Due to the variability of this rotation, there is no individual curriculum that is appropriate for all.

**Anticipated Schedule While on Rotation**
Research is a dedicated time period. The schedule is individualized but does not involve covering calls
for clinical services. However, all trainees engaged in research are expected to maintain their
continuity clinics during their research block, as required by the ACGME and the COCATs group.

**Supervision Policy**
The mentor selected will be solely responsible for supervising the trainee’s progress and
performance. Periodic evaluations will be provided by the mentor as appropriate.

**Evaluation Process**
Fellows will be evaluated on rotation using a competency-based system in the online E*Value
(www.e-value.net) program.

**Cardiac Rehabilitation**

**Rotation Sites**

*Southeast Louisiana Veterans Health Care System*
  Faculty: Kevin Cartwright, MD

**Goals**
To expose Tulane Cardiology program trainees to high level rehabilitation medicine experts.
To understand the effectiveness and limitations of cardiac rehabilitation and to understand proper
patient selection.
To achieve the appropriate cognitive knowledge and technical skills needed to understand,
recommend, and/or perform cardiac rehabilitation.
To foster an attitude of life-long learning and critical thinking skills needed to gain from experience
and incorporate new technical and intellectual developments in the field of rehabilitation.

**Specific Responsibility of the Rotating Fellow**
The Fellows will be expected to learn about the main indications and contraindication for cardiac
rehabilitation by attending at minimum of one session 3 days a week – Monday and Friday.

Trainees are not primarily responsible for the care of patients during rehabilitation exercises. All training and exercise is performed under the direct guidance and supervision of a physician and the assigned exercise physiologist. The Fellows are not responsible for ordering exercise protocols or specific medications. Their role is mostly observational, although they may be able to interpret electrocardiographic strips that will then be confirmed by an attending physician.

**Evaluation of Trainees**

Interpretative and technical skills must be evaluated in every trainee. Quality of clinical follow-up, reliability, complications, interaction with other physicians, patients, laboratory support staff, initiative and ability to make independent and appropriate decisions are to be considered.

Evaluations are performed electronically via the program known as: Myevaluations.com

**Continuity Clinics**

**Rotation Sites**

*Site 1: Southeast Louisiana Veterans Health Care System*
  Faculty: Gholam Ali, MD; Mark Cassidy, MD; Anand Irimpen, MD; Thierry Le Jemtel, MD; Nidal Abi Rafeh, MD; Kevin Cartwright, MD; Atul Singla, MD

*Site 2: University Medical Center New Orleans (UMCNO)*
  Faculty: Aaron Sweeney, MD; Rohan Samson, MD; Kevin Cartwright, MD; Robert Hendel, MD

**Curriculum Content and Methods**

Due to the variability of this rotation, there is no individual curriculum that is appropriate for all.

Exposure of Cardiology Fellows to clinical experience in an outpatient setting is an integral part of the core curriculum of cardiovascular training programs. To adhere to RRC requirements, the Tulane University Cardiovascular Fellowship Program programs a minimum of one half-day per week ambulatory clinic experience for all Fellows during each year of their three-year training.

The primary outpatient clinic is located at University Medical Center New Orleans (UMCNO). A secondary outpatient clinic is located at the Southeast Louisiana Veterans Health Care System, New Orleans (VA). These clinics are fully staffed with nurses and ancillary personnel. A wide variety of medical and surgical consultative services, including social and dietary services are available for all patients. Electrocardiograms can be obtained on-site. Access to patient information and records are available in both facilities. Efforts were made to create an environment similar to an office practice.

University Medical Center New Orleans (UMCNO) provides a good mixture of cardiovascular diseases, including CAD and valvular heart disease. Each Fellow staffs a half-day cardiology clinic every other week under the direct supervision of an attending cardiologist.

The VA provides care exclusively for eligible veterans, a population with a high incidence of cardiovascular disease, and hence offers a wide exposure to the most commonly encountered cardiology problems. Each Fellow staffs, under the direct supervision of an attending cardiologist,
Every outpatient clinic is staffed by a cardiology faculty member who is responsible for supervisory and teaching activities as well as for handling administrative issues that may arise. The first and second year Fellows are expected to present all of their cases to the attending staff prior to final disposition. The third year Fellows are also encouraged to discuss their cases with staff, particularly patients being seen for the first time. Teaching sessions include the etiology, pathogenesis, clinical presentation and natural history of disease, developing skills in diagnosis, mature judgment and resourcefulness in therapy. Instruction and feedback is provided about clinical interviewing, communication and interpersonal skills that are necessary to elicit and record a thorough and accurate history, and to establish and maintain an appropriate physician-patient relationship.

Goals
- Learn the differential diagnosis for common presenting symptoms and signs and utilize appropriate diagnostic methods.
- Learn the appropriate management strategies for cardiovascular diseases in an outpatient setting, including utilization of pharmacological therapy, invasive and noninvasive testing and timing for surgical or percutaneous interventions.
- Learn the cardiovascular risk factor evaluation and modification in patients with or at risk for cardiac disease.
- Develop competency in providing consultative services to other specialties, including preoperative cardiac evaluation for patients planned to undergo non-cardiac surgery.
- Improve communication skills with referring physicians and other health care professionals.
- Learn the appropriate intervals for periodic evaluation and testing of patients with chronic disease.
- Learn appropriate utilization of consultation services requested from other specialties.
- Gain a longitudinal perspective regarding the clinical course of patients with chronic disease.
- Learn the basics of medical record documentation and coding.

Evaluation Process
The formal evaluation, via E*Value (www.e-value.net), of Fellow performance will be conducted on a quarterly basis by the cardiology faculty who will be discussing the evaluation with the Fellow in person. Ancillary personnel and random patients are also asked to evaluate the Fellow. Evaluations are based on several factors, including Fellow’s knowledge base, clinical judgment, history taking and physical examination skills, humanistic qualities and professional attitude.

<table>
<thead>
<tr>
<th>Legend for Evaluation Methods for Fellows</th>
</tr>
</thead>
<tbody>
<tr>
<td>AE</td>
</tr>
<tr>
<td>DSP</td>
</tr>
<tr>
<td>ECR</td>
</tr>
</tbody>
</table>
Fellow Clinic Assignments/Schedule
Fellows are required to follow at least one half-day clinic per week, one at the VA Medical Center and one half-day clinic every other week at ILH UHMOB Clinic. The wide diversity of pathology seen in the clinics helps to supply the Fellows with clinical experiences concerning vastly different population models.

Tulane-UMCNO Adult Cardiology Continuity Clinics
Academic Year 2016-2017
Faculty: Gholam Ali, MD, Kevin Cartwright, MD, and Aaron Sweeney, MD
Hours: 12:30 p.m. to 4:30 p.m.
Rotation: ½ day every other week

Alternating teams are assigned to UMCNO Adult Cardiology Clinic, which is held on Thursdays from 12:30 p.m. to 4:30 p.m. The clinic consists predominantly of indigent care for the New Orleans area including men and women with a high degree of ethnic diversity. The patients display a consistently broad variety of cardiovascular pathophysiology. The outpatient clinics are supported by a full nursing staff with a computerized scheduling/appointment system. A clinical faculty attending is present for each clinic.

Team A (every other Wednesday/Thursday beginning July 6th, 2017):

Wednesday (A1):
Ayush Motwani, MD
Prabhpreet Singh, MD
Mehul Bhalja, MD
Minnsun Park, MD
Kapil Yadav, MD

Thursday (A2):
Bradley Deere, MD
Mokhtar Abdallah, MD
Alaa Boulad, MD
Manmeet Singh, MD

Team B (every other Wednesday/Thursday beginning July 13th, 2017)

Wednesday (B1):
Karnika Ayinapudi, MD
John Moscona, MD
Ahmad Jabbar, MD
Tariq Yousuf, MD
**Thursday (B2):**
Twinkle Singh, MD  
Paul Katigbak, MD  
Taraka Gadiraju, MD  
Patrick Ters, MD

The fellow assigned to CHF will be excused from clinic during that month’s rotation.

**Congestive Heart Failure Clinic: every afternoon at VANO**
July – Prabhpreet Singh, MD  
August – Paul Katigbak, MD  
September – John Moscona, MD  
October – Rohit Maini, MD  
November – Manmeet Singh, MD  
December – Mokhtar Abdallah, MD  
January – Minnsun Park, MD  
February – Ayush Motwani, MD  
March – Bradley Deere, MD  
April – Karnika Ayinapudi, MD  
May – Twinkle Singh, MD  
June – Tariq Yousuf, MD

**Tulane Medical Center Clinic: every Monday/Tuesday afternoon**
Academic Year 2017-2018

**Monday PM:**
*Week A* – Soidjon Khodjaev, MD  
*Week B* – Indrajeet Mahata, MD

**Thursday AM:**
*Week A* – Rohit Maini, MD  
*Week B* – Miyako Igari, MD

**Southeast Louisiana Veterans Health Care System Clinics**
Academic Year 2017-2018

Faculty: Thierry Le Jemtel MD; Mark Cassidy, MD; Gholam Ali, MD; Kevin Cartwright, MD; and Ahmad Slim, MD.

Hours: 1:00 p.m. to 5:00 p.m.  -  Rotation: ½ day, Weekly.

At the VA Hospital, the outpatient clinics are held on Monday, Tuesday, Wednesday and Friday from 1:00 p.m. to 5 p.m. and provide care for military veterans. The clinics are supported by a full nursing staff and a computerized scheduling/appointment system as well as computerized chart delivery and a new drug delivery system. Additional sophisticated computer support is available to aid the house staff and Fellows with patient care and management. All medical and surgical subspecialties are represented in the VA outpatient clinic.
Monday:
Mokhtar Abdallah, MD
Manmeet Singh, MD
Minnsun Park, MD
Bradley Deere, MD
Mehul Bhalja, MD
Alaa Boulad, MD
Prabhpreet Singh, MD

Tuesday:
Paul Katigbak, MD
Twinkle Singh, MD
John Moscona, MD
Ahmad Jabbar, MD
Taraka Gadiraju, MD
Tariq Yousuf, MD
Patrick Ters, MD

Friday:
Ayush Motwani, MD
Soidjon Khodjaev, MD
Karnika Ayinapudi, MD
Rohit Maini, MD
Miyako Igari, MD
Indrajeet Mahata, MD

Wednesday and Thursday afternoons’ Congestive Heart Failure Clinic (noted on monthly schedule)

Friday morning Electrophysiology/Pacemaker Clinic: (noted on monthly schedule)

Cath Lab Coverage While Fellows Are in Clinic
The cath labs will be covered by Fellows on other cath rotations (VA Cath, TU Cath, or UMC Cath). In the rare circumstance that there is no coverage, please notify the chief fellows the day prior.

Support
Fellows are not required to generate any portion of their salary. Fellows in the clinical training program are guaranteed salary support for the three ACGME-accredited years.

Benefits

Disability Insurance
Disability benefits begin the first day of the month after three months of continuous total disability. Benefits continue until the end of disability or to age 65.
**Health Insurance**
Health insurance is provided free for all residents and Fellows. Coverage for spouse and/or dependent children may be purchased at additional cost.

**Lab Coats**
Each Fellow has access to a lab coat service, which provides white coats free of charge to Fellows. Each week, Fellows can turn in a lab coat and receive a clean coat. The Linen Room is located in the Tulane Medical School Store Room on the first floor. Operation hours: Tuesday – Friday 10:00 a.m. to 12:00 p.m. and 1:00 p.m. to 3:00 p.m.

**Life Insurance**
$25,000 life insurance is provided free to residents/fellows.

**Meals**
Tulane Medical Center provides breakfast, lunch, and dinner, on the first floor in the cafeteria, for Fellows on call. For information on how and where to get your food account card, call Mr. Milton Toepfer at 988-3960. 8 a.m. - 4 p.m.

**Pagers**
1. Individual Pagers are provided by the GME office through the program coordinator. They are distributed during the Dept. Orientation at the first year of Fellowship.
2. EP, CHF, STEMI, and UMCNO Call pagers are purchased by Department, please handle it with care. In any cases of misplace/loss, the fellow in that rotation is responsible for the replacement charge applied.

**Parking**
Tulane Medical School parking is provided free of charge.

**Book Funds**
$450.00/per fellow per year to cover costs of books, presentations and other educational expenses during the course of his/her training period. All costs must be pre-approved by the Fellowship Coordinator and Program Director.

**Pay**
Fellows are paid bi-monthly. Pay is directly deposited into an account. Pay Scale for 2017 - 2018:

<table>
<thead>
<tr>
<th>Level</th>
<th>Pay Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>HO IV</td>
<td>$55,526.72</td>
</tr>
<tr>
<td>HO V</td>
<td>$57,875.13</td>
</tr>
<tr>
<td>HO VI</td>
<td>$60,382.94</td>
</tr>
</tbody>
</table>

**Awards**
Two awards are given out each year during the graduation ceremony. The Albert L. Hyman Fellow of the Year Award is awarded to an outstanding Fellow each year. Faculty votes on this award. A
monetary award may of $500 is provided to the awardee in addition to a recognition plaque.

The second award is the C. Thorpe Ray Clinical Cardiology Award. It goes to an outstanding faculty member voted on by Fellows.

**Professional Liability Coverage**
Professional liability coverage is provided while rendering service as a cardiology Fellow in any of the affiliated hospitals.

**Vacation/Education/Sick Leave**
Fellows receive 20 days of paid vacation; five educational leave days are awarded on a case-by-case basis, and 10 days of paid sick leave per year. Special provisions are made for third year Fellows to allow for interview time.

**Holidays for 2015-2016 Academic Year**

<table>
<thead>
<tr>
<th>Holiday</th>
<th>TUSOM</th>
<th>TMC</th>
<th>VA</th>
<th>LSUHSC/ILH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independence Day</td>
<td>7/4/2017</td>
<td>Closed</td>
<td>Closed</td>
<td>Open</td>
</tr>
<tr>
<td>Labor Day</td>
<td>9/4/2017</td>
<td>Closed</td>
<td>Closed</td>
<td>Closed</td>
</tr>
<tr>
<td>Columbus Day</td>
<td>10/9/2017</td>
<td>Open</td>
<td>Open</td>
<td>Closed</td>
</tr>
<tr>
<td>Veterans Day</td>
<td>11/11/2017</td>
<td>Open</td>
<td>Open</td>
<td>Closed</td>
</tr>
<tr>
<td>Thanksgiving Day</td>
<td>11/23/2017</td>
<td>Closed</td>
<td>Closed</td>
<td>Closed</td>
</tr>
<tr>
<td>Day After Thanksgiving</td>
<td>11/24/2017</td>
<td>Closed</td>
<td>Open</td>
<td>Open</td>
</tr>
<tr>
<td>Christmas Eve</td>
<td>12/24/2017</td>
<td>Closed</td>
<td>Open</td>
<td>Open</td>
</tr>
<tr>
<td>Christmas</td>
<td>12/25/2017</td>
<td>Closed</td>
<td>Closed</td>
<td>Closed</td>
</tr>
<tr>
<td>Winter Recess</td>
<td>12/27/2017</td>
<td>Closed</td>
<td>Open</td>
<td>Open</td>
</tr>
<tr>
<td>Winter Recess</td>
<td>12/28/2017</td>
<td>Closed</td>
<td>Open</td>
<td>Open</td>
</tr>
<tr>
<td>Winter Recess</td>
<td>12/29/2017</td>
<td>Closed</td>
<td>Open</td>
<td>Open</td>
</tr>
<tr>
<td>New Year's Eve</td>
<td>12/31/2017</td>
<td>Closed</td>
<td>Open</td>
<td>Open</td>
</tr>
<tr>
<td>New Year's Day</td>
<td>1/1/2018</td>
<td>Closed</td>
<td>Closed</td>
<td>Closed</td>
</tr>
<tr>
<td>Martin Luther King Day</td>
<td>1/15/2018</td>
<td>Closed</td>
<td>Open</td>
<td>Closed</td>
</tr>
<tr>
<td>Lundi Gras</td>
<td>2/12/2018</td>
<td>Closed</td>
<td>Open</td>
<td>Open</td>
</tr>
<tr>
<td>Mardi Gras</td>
<td>2/13/2018</td>
<td>Closed</td>
<td>Closed</td>
<td>Open</td>
</tr>
<tr>
<td>Presidents' Day</td>
<td>2/19/2018</td>
<td>Open</td>
<td>Open</td>
<td>Closed</td>
</tr>
<tr>
<td>Good Friday</td>
<td>3/30/2018</td>
<td>Closed</td>
<td>Closed</td>
<td>Open</td>
</tr>
</tbody>
</table>
Holiday Coverage Schedule
The goal is to find optimal coverage while giving as many people as possible the holiday off. The outline below describes call schedules from 7 a.m. – 5 p.m. Requests for holiday leave will be considered on a case-by-case basis within the context of the coverage needs of the program.

A. Independence Day, Labor Day, Thanksgiving Day and Mardi Gras: The person on primary call provides coverage starting at 7 a.m. as if it were the weekend. The back-up is available to assist if needed. Rounding will be similar to the weekend.

B. Day after Thanksgiving and Lundi Gras: The person on primary call covers all duties starting at 7 a.m. with the aid of the back-up as needed. However, scheduled, non-emergent echoes and caths at the VA will be done by the Fellows covering the VA CCU and VA cath services respectively. We will not place the VA CCU Fellow or the VA cath Fellow on primary call on these days.

C. Columbus, Veterans’ and President's Days are holidays at the VA only. The VA CCU/Consult Fellow will cover emergency echoes and caths at the VA, giving VA echo and VA cath Fellows the day off. These are routine workdays for everyone else.

D. Good Friday is not a VA holiday. All others will work a routine day.

E. MLK Day and Memorial Day will be considered holidays with the person starting primary call at 7 a.m. However, echo and cath Fellows will work a routine day, as these are not hospital holidays. All TUMC consults and admissions until 1 p.m. will be handled by the Tulane CCU Fellow; afterwards, the primary call Fellow will handle TMC consults and admissions. (Maximum people working: 6)

Policies and Procedures
Policy on Resident Eligibility, Selection and Promotion

Resident Eligibility
Applicants with one of the following qualifications are eligible for appointment to Tulane University Cardiovascular Diseases Fellowship Program:

1. Graduates of medical schools in the U.S. and Canada accredited by the Liaison Committee on Medical Education (LCME).
2. Graduates of medical schools in the U.S. and Canada accredited by the American Osteopathic Association (AOA).
3. Graduates of medical schools outside the U.S. and Canada who meet both of the following qualifications:
   a. Have received a currently valid J-1 Visa sponsored by the Educational Commission for
Foreign Medical Graduates, and;
b. Have a full and unrestricted license or a Graduate Education Temporary Permit (GETP) to practice medicine in the state of Louisiana.

4. Graduates of medical schools outside the U.S. who have completed a Fifth Pathway program provided by an LCME-accredited medical school.

Resident Selection

1. Tulane University Cardiovascular Diseases Fellowship Program selects from among eligible applicants on the basis of their preparedness and ability to benefit from the program to which they are appointed. Aptitude, academic credentials, personal characteristics and ability to communicate are considered in the selection. These characteristics are accessed by means of the requirements for a letter from the Residency Program Director of the candidate, letters of recommendation from faculty and others acquainted with the applicant, and the day of interviews by faculty, fellows and others in the program. The Tulane University School of Medicine has as its policy to consider all candidates for graduate medical education regardless of race, sex, creed, nationality or sexual orientation. Performance in medical school, personal letters of recommendation, official letters of recommendation, achievements, humanistic qualities and qualities thought important to the desired specialty are used in the selection process.

2. Tulane University Cardiovascular Diseases Fellowship Program participates in the National Residency Matching Program (NRMP).

Resident Promotion

The Program Director and Clinical Key Faculty will annually review the progress of each fellow in consideration of advancement. Fellows will be advanced to the next PGY level based on clear evidence of progressive academic and professional growth over the range of cardiovascular diseases.

1. For a first year cardiology fellow to advance to the next level, he/she must be able to:
   a. Obtain an accurate and thorough directed cardiac history and perform a detailed cardiac physical examination.
   b. Synthesize the history, physical exam, laboratory and diagnostic testing information into an organized and meaningful presentation.
   c. Develop a differential diagnosis based on the available data.
   d. Demonstrate progressive development in the management of common cardiovascular diseases.
   e. Effectively lead a team of internal medicine residents and medical students on the intensive care unit service.
   f. Educate medical students and internal medical residents in the basics of cardiovascular disease.
   g. Discuss indications, contraindications and possible complications of routine cardiac procedures.
   h. Show progress in the performance of cardiac procedures under the supervision of attending cardiologists.
2. For a second year cardiology fellow to advance to the next level, he/she must be able to:
   a. Show continued progress in the elements required to advance from first to second year fellow level.
   b. Use all history, physical examination, laboratory data and diagnostic testing results to narrow differential diagnosis to a presumptive diagnosis and initiate therapy.
   c. Approach patient management in an evidence-based manner.
   d. Perform cardiac procedures safely under the supervision of attending cardiologists.

3. For a third year fellow to successfully graduate from the fellowship training program, he/she must be able to:
   a. Meet all of the above listed criteria for advancement.
   b. Meet the six ACGME core competencies.
   c. Demonstrate competence in all areas of clinical Cardiology.
   d. Be able to function independently as a cardiologist.
   e. Safely perform usual invasive and non-invasive cardiac procedures.
   f. Achieve ABIM required competences.

Policy on Supervision of Fellows
It is the policy of the Section of Cardiology that all residents are given the required level of supervision in all aspects of their training and that this supervision will be documented in the medical record.

The Program Director is responsible for the quality of the overall education and training program discipline and for ensuring that the program is in compliance with the policies of the respective accrediting and/or certifying body (RRC’s).

Program supervision of residents is expected in all areas of all affiliated institutions to assure consistently high standards of patient care. It is a cardinal principle that overall responsibility for the treatment of each patient lies with the staff practitioner to whom the patient is assigned and who supervises the resident physician. All inpatients and outpatients will have one staff practitioner listed as the physician in charge of the patient’s medical treatment. The name of this staff practitioner will be clearly designated on each patient’s medical record.

A Medical Staff member will be involved in patient treatment to the degree necessary to assure consistently high standards of patient care. This staff practitioner will be responsible for, and must be familiar with, the care provided to the patient. The staff practitioner is expected to fulfill this responsibility, at a minimum, in the following manner:

Direct the care of the patient and provide the appropriate level of supervision based on the nature of the patient’s condition, the likelihood of major changes in the management plan, the complexity of care, the experience and judgment of the resident being supervised and within the scope of the approved clinical privileges of the staff practitioner. Documentation of this supervision will be via progress note, or countersignature of, or reflected within, the resident’s progress note at a frequency appropriate to the patient’s condition, according to each affiliated institution’s requirements.

Participate in attending rounds. Participation in rounds provides the supervision to residents. A
variety of face-to-face interactions such as chart rounds, record review sessions, pre-op reviews or informal patient discussions also fulfill this requirement.

As residents advance in their education and training, they may be given progressively increasing levels of responsibility. The degree of responsibility will depend upon the individual's general aptitude, demonstrated competence, and prior experience with similar procedures, the complexity and degree of the risks involved in the anticipated surgical/invasive procedure. An important aspect of a resident's learning experience is the opportunity of a senior resident to supervise more junior residents. This, however, does not release the staff practitioner's responsibility for the oversight of the patient's care.

**Graduated Levels of Responsibility**

The program director will be responsible for developing a personal program with each fellow that will assure continued growth and guidance from teaching staff. As part of their training program, fellows will be given progressive responsibility for the care of patients. A fellow may act as a teacher assistant to less experienced fellows, and to internal medicine residents and medical students. Assignment of the level of responsibility must be commensurate with their acquisition of knowledge and development of compassion, judgment and skill, and consistent with safe and effective patient care and with the requirements of accrediting agencies.

Based on a fellow's knowledge, skill, experience and judgment, fellows will be assigned graduated levels of responsibility to perform procedures or conduct activities without a supervisor directly present, and/or act as a teaching assistant to less experienced fellows, and to internal medicine residents and medical students. The determination of a fellow's ability to accept responsibility for performing procedures or activities without a supervisor directly present and/or act as a teaching assistant will be based on documented evidence of the fellow's clinical experience, judgment, knowledge and technical skill.

As fellows advance in their education and training, they may be given progressively increasing levels of responsibility. The degree of responsibility will depend upon the individual's general aptitude, demonstrated competence, prior experience with similar procedures, the complexity and degree of the risks involved in the anticipated surgical/invasive procedure. An important aspect of a fellow's learning experience is the opportunity of a senior fellow to supervise more junior fellows, residents and medical students. This, however, does not release the staff practitioner's responsibility for the oversight of the patient's care.

When a fellow is acting as a teaching assistant, the staff practitioner remains responsible for the quality of care of the patient, providing supervision and meeting medical recorded documentation requirements as defined within this policy.

**Policy on Residents' Duty Hours**

(From Tulane University School of Medicine, Office of Graduate Medical Education Policies and Procedures for Residents and House Officer)

Regardless of where affiliated rotations are offered, duty hours and on-call time periods must not be excessive for
the residents of Tulane University. The structuring of duty hours and on-call schedules must focus on the needs of the patient, continuity of care, and the educational needs of the resident. Duty hours must be consistent with the Institutional and Program Requirements that apply to each program:

- A maximum of 80 hours per week averaged over four weeks
- 14 hours off for rest and personal activities between duty periods and after call
- 24 hours maximum continuous on-site duty with up to 6 additional hours permitted for patient transfer and other activities to be defined in RRC requirements
- No new patients after 24 hours of continuous duty
- Resident time spent in the hospital during at-home call to be counted toward the 80 hours
- In-house “moonlighting” to be counted toward the 80 hours
- Program directors and faculty to adopt policies to prevent and counteract effects of fatigue
- Duty hours to be monitored by program and sponsor

Night/Weekend/Holiday Call Duty

- The call schedule is prepared by the Chief Fellow(s). It is the sole responsibility of the Fellows requesting a schedule change to notify the Program Coordinator or chiefs verbally and by email in a timely manner. Email is required. All requests must be submitted in writing.
- Fellows in the cardiovascular program in TMC are responsible for night and weekend call duty on a rotational basis as assigned by the Program Director and chief fellows.
- Call shall not exceed more than 8 (eight) nights per month.
- The Adult Cardiology Fellow on call will be responsible for night and weekend coverage of TMC, VA, and UMCNO. A revision of this provision is possible if the burden of duty should change as programs grow and become busier or the new hospital open.
- A call room with heating, cooling, an open phone line and annexed restroom facility is provided for the Cardiology Fellow on call at TMC. The Fellow on duty is also provided with meals. See Medical Services for exact location of call room or you may ask your Chief Fellow.
- The Cardiology Fellow on duty is expected to take call from home. The Fellow must be present in the hospital within 20 minutes if necessary.
- The 80 hours/week and 30 consecutive hours’ on-call rules are strictly enforced. Duty hours are to be entered into the E-Value system on a daily basis, and are monitored by the Program Director and Program Coordinator. Visit the ACGME webpage at www.acgme.org for a full listing of duty hour rules.
- The first rule states that no trainee shall work more than a total of 80 hours in a week inclusive of in-house moonlighting (in the case of this particular program moonlighting at the VA, TMC and UMCNO qualifies as in-house moonlighting).
- The second rule states that no trainee shall work for more than 30 consecutive hours when taking night call duty. Call from home with no contact with the hospital is not counted as part of the 30-hour maximum call duration.
- Since this program allows trainees to take call from home, the reporting of the total number of hours worked is honor based. Faculty will respect the self-reporting provided by the Fellow and will release the Fellow from duty if the Fellow was on duty
• 30 consecutive hours.
• The current call starts at 5 p.m. and ends at 7 a.m. the following morning (14 hours).
• It is highly unlikely that any Fellow will need to be excused prior to the end of business (5 p.m.) on the post-call day.
• If a Fellow chooses to spend the night in the call room for his/her convenience but does not participate in any clinical activity during that call, the hours spent in house will not be counted toward the total amount of 30 consecutive hours.

Guidelines For Cath Fellows On Call

One Fellow will be on primary call with a second person on backup call (the assigned general cardiology fellow). **ALL ON CALL FELLOWS WILL RESPOND TO STEMI ACTIVATIONS.**

Primary Call Responsibilities

• Primary call will be responsible for all hospitals and emergency rooms consults while on call.
• Weekday calls start at 5 p.m. and ends at 7 a.m. the following day.
• Weekend calls start at 5 p.m. Friday and ends at 7 a.m. Saturday.
• Saturday, Sunday, and all holiday calls are from 7 a.m. to 7 a.m. (24 hours).
• Obtain proper sign out from Fellows on service prior to starting call.
• Give proper sign out to the Fellows on service the following morning.
• Respond to all pages in a timely manner (within 5 minutes).
• Learn to prioritize the evaluation of patients dependent upon patient status and time constraints.
• At all times, avoid confrontation with requesting Fellows and staff.
• See all consults during call hours and do not leave consults for the next day.
• Evaluate all critically ill patients without delay.
• All acute coronary syndromes (STEMI and NSTEMI) should be evaluated within 10-15 minutes of the initial page.
• When in doubt, call the backup Fellow for advice.
• If the primary Fellow is involved with a sick patient and is unable to attend to an emergency, the backup call Fellow must be called to assist.
• The primary call Fellow will resume responsibility as soon as possible.
• Any issues of contention arising during call will be addressed by the Chief Fellow and Program Director after proper evaluation.
• You may call echo techs at TMC for emergency echocardiograms. You are responsible for imaging in the UMCNO system.
• Patients being admitted to the University system may be admitted to the chest pain service with the help of the medicine residents on call. Further guidelines for this will be provided. Certain patient groups must be assessed by the Fellow without exception.
• All consultations must be accepted promptly and expedited in an efficient and courteous manner.
• Back Up Call Fellow Responsibilities
• The Backup Call Fellow will advise primary Fellow on appropriate course of action in any situation.
• The Backup Call Fellow will participate in all emergency cases in the Cath labs or emergency TEE’s.
• The Backup Call Fellow will go into the hospital to assist the primary Fellow in responding to acute myocardial infarctions (acute MI's).
• The Backup Call Fellow will assist in performing if needed or in emergency situations till primary Fellow is proficient in the technique and interpretation of echocardiograms.
• The Backup Call Fellow will assist with consults/admissions only if the primary Fellow on call is occupied with an emergency and cannot attend to the patient in a timely manner.

**Jeopardy Coverage**

If a Fellow during any rotation should become ill or become suddenly impeded to perform properly, he/she should notify the Program Director's office immediately of his/her inability to attend to his/her duty. The notification should not be received more than 4 hours from the start time of the planned duty. Proper forms of notification are:

- A verbal phone communication with the Program Director or Program Coordinator (voice mail messages are not acceptable)
- A written e-mail message marked URGENT to the Program Director or Program Coordinator.
- A Fellow from another service where more than one trainee is currently present will cover the unexpected absence of the ill/impeded Fellow.
- If no service has more than one Fellow that can be removed to cover the unexpected absentee, the Fellow covering the following rotations will be called upon to help:
  - Rehabilitation/prevention
  - Research
  - Imaging
  - Vascular

**Communication**

Communication is done via email, text pages, verbally, and by mail. Please read emails and check your mailbox daily.

Fellows should provide their pager number or personal cell phone number as contact numbers when filling out information of a personal nature. The cardiology office will not be an answering service.

**Non-teaching Patients**

As the Tulane University is a teaching medical school, all patients admitted to Tulane University Hospital and Clinic, University Hospital, and to the VA system are admitted to a teaching service. Cardiology fellows do not round on non-teaching patients.

**Order Writing**

When the Cardiology Fellow is the primary care provider for an inpatient, ultimate responsibility resides with the Fellow for order writing. When the Cardiology Fellow serves as a consultant, ultimate responsibility for order writing resides with the Primary Care team. All verbal orders must be signed prior to patients discharge.
Procedure Log
For credentialing purposes Fellows are required to keep a log of the procedures they perform. The procedure log that should be used to track your procedures is located on our website and on E*Value (www.e-value.net) the web-based evaluation program. These are to be submitted and downloaded monthly.

BLS/ACLS
All Fellows entering the program must be ACLS and BLS certified. The program will provide one refresher course for each Fellow. Courses are available online at www.som.tulane.edu/lifesupport or call the Tulane Center for Advanced Medical Simulation and Team Training at 504-988-9150. Once you have paid for your course, give the receipt and a copy of your renewed ACLS or BLS card to the Fellowship Program Coordinator for reimbursement within 30 days of the renewal. All Fellows are expected to keep these certifications current.

Leave Request Policy
NOTE: No leave is allowed while on TMC CCU, EP, CHF or UMCNO CCU.

NOTE: No leave is allowed during June except on a case-by-case basis approved by the Program Director and Section Chief.

NOTE: Vacation leave requests must be submitted to the Program Coordinator at least 1 month prior to leave.

Leave request forms can be downloaded from our web page http://tulane.edu/som/tuhvi/fellowships/fellowships.cfm, in the TUHVI Fellowships folder in the Tulane Box storage system https://tulane.app.box.com/login and can also be found in the Fellows’ office. All requests must be submitted to program coordinator with appropriate signatures at least one month prior to date of leave.

Maximum consecutive vacation allowed is 2 weeks. Maximum time away from a given rotation, including time used to cover other rotations, is 2 weeks.

UMCNO Adult Cardiology clinics and VA clinics may be cancelled according to the policies of each clinic or coverage by another Fellow may be arranged. Clinics may only be canceled with a 90-day notice. Six clinics per academic year may be canceled, but cancellation of clinics is strongly discouraged and has to be approved by the Program Director.

Emergency leave will be evaluated on a case-by-case basis by the Program Director and Section Chief depending upon the circumstances.

Coverage Options
Fellows are required to arrange their own coverage for clinical responsibilities and conference presentations, regardless of the circumstances. Neither the Chief Fellow nor the Program Coordinator is responsible for arranging coverage.

Take leave while on a rotation that does not require coverage.
VA & UMCNO clinics will be canceled by the Program Coordinator only if it is indicated on the leave form and with a minimum of 90 days notice. If you do not select to have your clinics canceled or indicate the date of clinics to be canceled, it will be assumed that you will attend clinic. Clinic dates must be accurate or the form will be returned to you for correction. No clinics will be canceled if they are not on a leave request and if the justification for the clinic cancellation is not given.

The Fellows on imaging rotations must provide coverage for the echo and nuclear stress labs at the respective institutions to which they are assigned. This coverage is an absolute priority as patient services cannot be rendered without the presence of the physician. The Imaging Fellow (NOT the personnel in the stress labs) is responsible for arranging coverage with another Fellow should he need to be absent; e.g., for clinic attendance or leave. Please make these arrangements in advance to avoid last minute crises and/or disruption of patient care.

**Rotations that require coverage**

- TMC Cath
- TMC Imaging
- VA CCU
- VA Echo
- VA Cath
- UMCNO CCU
- UMCNO Cath
- UMCNO Echo

**Rotations not needing coverage**

- Vascular Medicine
- Congenital Heart Disease
- Cardiac Rehabilitation
- Electives

All leave requests must be signed in full before they are turned in to the program coordinator, and must be submitted to the program coordinator at least 1 month prior to leave.

A special provision is made for the 3rd year Fellows in consideration of their need to arrange for interview time and travel to visit future employment sites. The program may allow a maximum of 5 working days in excess of the normal vacation time for this purpose, but only to graduating Fellows.

Educational leave - Documentation is required for educational leave and should be attached to the leave request.

Sick leave is reserved for severe illness. If you are short of vacation or educational leave, you cannot substitute sick leave.

Vacation requests will be handled by chief fellows.

**Moonlighting**

Fellows are allowed to moonlight including in-house moonlighting. All moonlighting must be disclosed in writing to the Fellowship Director at the beginning of each month. The information should be updated during the ensuing 30 days as the moonlighting Fellow accepts new duties. The reporting is done on an honor basis but it is binding to the rules of the program.

The Program Director has the right to allow or disallow moonlighting on an individual Fellow basis.
and/or for the entire Fellowship. If the moonlighting is excessive, a Fellow will be specifically told to curb his/her commitment to these activities.

Moonlighting will be monitored and the total number of hours a Fellow can work will be restricted to an absolute maximum of 80 hours/week. These hours are a combination of hours spent in the hospital, attending to the Fellowship duties (on call duties included) and the hours of moonlighting.

Moonlighting will NEVER be permitted during the hours of 8 a.m. to 5 p.m. Monday through Friday of any working week. Holidays are excluded from this mid-week banning, but only for the actual holidays and not the days leading to or immediately following the vacation days.

Moonlighting will NEVER be permitted during the hours of 8 a.m. to 5 p.m. Monday through Friday when the Fellow is involved in any elective or research rotation.

Moonlighting will NEVER be permitted when the Fellow is on-call in any capacity (first or second call, house call etc.).

Any deviation from these rules will result in automatic placement of the Fellow in a 3-month probation period followed by suspension and termination of his/her contract if the incident should recur.

**Grievance Procedure**

Please see the Policies and Procedures Handbook on the Graduate Medical Education website or in the hardcopy you received during orientation.


**Policy on Fellowship Travel**

Submission of papers and abstracts to conferences is a professional development undertaking. It is at the discretion of the Program Director to approve leave requests for any Fellows who are invited to present a paper or abstract. Fellows approved for travel may also be offered partial or full reimbursement for trips at the discretion of the Program Director and the Section Administrator in addition to their Book Fund that may be used for the purpose of educational travel. If the Section pays for a Fellow's travel, the following will apply:

The program will only pay for hotel expenses for the day of departure (the day prior to the presentation) through the day of presentation. Meals will be reimbursed on a per diem schedule provided to traveling Fellows prior to their trip. No alcohol will be reimbursed.

The program may choose to pay up to a certain amount of expenses and the remainder of travel expenses will be the responsibility of the Fellow to cover.

International business travel is highly discouraged. The Program Director and Section Chief must approve international travel and will determine with the Section Administrator, the level of financial support offered to Fellows traveling to international conferences.
Policy on Fellowship Expense Reimbursement

Expenses reimbursed to Fellows by the program include expenses associated with licensing, certifications, training related book purchases, educational events and travel. Prior to making any expenses, please check with the Fellowship Program Coordinator to ensure eligibility for reimbursement. Some expenses will only be reimbursed with prior authorization from the Program Director, such as travel and educational events.

Fellow Travel/Poster Presentation Reimbursement Policy

The Department will reimburse up to 5 fellows within each fiscal year (July 1 to June 30) for the cost of poster printing and travel expenses for presentation of research. Each reimbursement is limited to $2,000 maximum. Eligibility of fellows will be determined on a case-by-case basis.

Eligible Expenses Include:

- Cost of Poster Printing
- Flight (Fellow Only)
- Hotel Cost (excluding any discretionary charges, e.g. room service, movies, etc.)
- Conference Registration
- Airport Parking
- Public Transportation (Shuttle, Taxi, Bus) between hotel, conference, and airport.

** Copies of all itemized receipts that include the date of purchase, method of purchase, items/services purchased must be saved and submitted within 30 days from the time of purchase. Fellows will not be reimbursed for any expenses without an itemized receipt.

Reimbursement Process:

Expenses must be paid by the fellow prior to the reimbursement. After the presentation, you may contact the fellowship office to notify us that you have Travel and/or Poster expenses for reimbursement. You will need to provide your original receipts for the eligible expenses, as well as a program, agenda, or itinerary from the conference. The flight receipt can be an email receipt, but must include the flight itinerary and boarding pass. Please do not use a flight and hotel “package” from a travel website. We will need the flight and hotel costs itemized separately. Once these receipts have been submitted, we will prepare a travel voucher of the expenses and will contact you when your signature is required. After the voucher is signed, it will be submitted to the TU Finance Department for auditing and payment. The time between submission and payment may vary, but please allow for up to 4 weeks to receive payment.

Please note: If this is your first conference expenses reimbursement, we will need your full name, home address, and social security # in order to issue a check.

Followings are additional information for travel expense reimbursement require your attention:
1. They will only reimburse food purchase if you have both receipts for credit card purchases. 1 with the items purchased – 1 with signature. Cash will be 1 receipt.

WARNING - EMPLOYEES

No Alcohol will be reimbursed for employee meals.

If you purchase food for another Tulane Employee while on a trip you will not be reimbursed for their items.

You will not be reimbursed for family members on a trip. If there is an added expense to hotel for 2 + in a room it will be calculated for 1 person. If you share a room with another Tulane employee please ask for separate bills.

If you go out to dinner/meeting you will not be reimbursed unless the dinner is in conjunction with an outside business person and pertains to the department. They will not reimburse you for a dinner with other Tulane employees even out of town.

2. If you pay for a dinner meeting/recruitment Tulane will only reimburse gratuity 20% of the bill before taxes.

3. If you order room service to your room. Upon check out you will need to request copies of the full receipts with items purchased for reimbursement. Otherwise this expense will be subtracted from your total.

Policy on Academic Remediation and Fair Hearing
(Adapted from the Tulane University School of Medicine, Office of Graduate Medical Education Policies and Procedures for Residents and House Officers Handbook)

Definitions

• House Staff or House Officer – refers to all interns, residents and fellows participating in a Tulane University School of Medicine post-graduate training Programs.
• Post-Graduate Training Program – refers to a residency or fellowship educational program.
• Academic Remediation – the act or process of remedying or correcting. This is an educational tool appropriate only when there is an educational deficit. Notice and opportunity to cure educational deficit(s) is/are provided.
• Institutional Probation – a formal level of academic or professional discipline. Notice and opportunity to cure, or in the case of serious misconduct resulting in patient safety issues or alcohol/drug violations, notice to be heard will be provided.
• Termination – the act of severing employment prior to the expiration date of the house officer’s contract.
• Non-Renewal – a decision not to renew a house officer’s participation in a postgraduate
training program. Such a decision is to be made prior to March 1 of each year. Termination for cause after this date is still a departmental option.

Policies

A. House Officers are expected to meet and adhere to academic, clinical and professional standards set forth in the Institutional, Departmental Program Requirements.
B. Inadequate performance should be clearly communicated, in writing, to the house officer as early as possible, and at minimum, at the six-month formal evaluation.
C. If the program director deems it necessary, the house officer may be placed on one of two levels of intervention:
   1. ACADEMIC REMEDIATION: Any house officer whose performance assessed to be unsatisfactory by the program director may be placed on Academic Remediation. The Program director shall inform the house officer in writing of the deficiencies noted in academic, clinical or professional performance. An improvement program will be developed to include the duration of the remediation program, the definition of successful completion of the program and the consequences of failure to successfully complete the remediation program. Improvement is the responsibility of the house officer. This documentation will be maintained in the house officer’s departmental file. Academic Remediation must be assigned for a specific period of time, not to exceed twelve (12) months in duration. Upon successful completion of Academic Remediation, the house officer will be removed from this status. Documentation will remain part of the house officer’s departmental file, but will only be disclosed upon written authorization of the house officer or through legal process. If the Academic Remediation is not successfully completed, institutional probation, repeating or extending a year of training, or termination/nonrenewal could result. Academic Remediation is not considered to be a disciplinary action. Assignment of Academic Remediation is not grounds for a house officer to request a Fair Hearing.
   2. INSTITUTIONAL PROBATION: If a house officer fails to meet the requirements as set forth in Academic Remediation, or it has been determined that the house officer has committed an egregious act, Institutional Probation with opportunity to be heard may be assigned. The program director shall inform the house officer in writing of the decision to place him/her on Institutional Probation. This letter should contain a very specific program opportunity to cure, criteria (goals and objectives) for successful completion of the probation. Institutional Probation must be assigned for a specific period of time, not to exceed six (6) months in duration. Upon successful completion of Institutional Probation, the house officer will be removed from this disciplinary status. Documentation will remain part of the house officer’s permanent file, but will only be disclosed upon written authorization of the house officer or through legal process. If the Institutional Probation is not successfully completed, the Probation may be extended for a period not to exceed six (6) months. The house officer’s training may also be extended or repeated as opposed to termination or non-renewal. Assignment of Institutional Probation is considered to be grounds for a house officer to request a Fair Hearing.
3. **FAIR HEARING PROCESS:** This policy is for all post-graduate training programs within the Tulane University School of Medicine to use in the adjudication of all actions resulting in probation, termination/non-renewal, or otherwise threatening the career of the house officer. This policy will apply to all house staff who participates in a graduate medical education (GME) training program within the Tulane University School of Medicine.

**Responsibilities/Requirements:**

A. A house officer may request a Fair Hearing when an action has been taken by the program that could result in the house officer’s career being significantly threatened, including Institutional Probation, Termination/Non-Renewal. Academic Remediation is not grounds for a Fair Hearing.

B. The purpose of the Fair Hearing is to ensure that the house officer’s due process rights have been met.

C. A resident may be removed from clinical responsibility pending the Fair Hearing, if the program director determines that patient care may be compromised.

D. A Fair Hearing must be requested within five (5) working days of the written notification of the action. All requests for Fair Hearing shall be made in writing, and addressed to the Associate Dean for Graduate Medical Education.

E. Once the request has been received, the Associate Dean of Graduate Medical Education will assure that a Fair Hearing is an appropriate means for adjudicating the complaint (see item 1 above). If the request is not appropriated for a Fair Hearing, the house officer will be notified and the matter will be referred back to the program director.

F. If the Associate Dean of Graduate Medical Education deems the Fair Hearing request to be for a valid reason, he/she will then convene the Fair Hearing board as identified below. Subject to the availability of all parties, the first meeting of the Fair Hearing Board will occur within 30 days of the written request.

G. The Fair Hearing Board will consist of the following five voting members, appointed by the chair:

- **CHAIR:** Associate Dean for Graduate Medical Education – (or designee in cases of conflict of interest, or inability to attend). The chair will be a nonvoting member.

  1. Three (3) faculty members from other programs not directly associated with the house officer.

  2. Two (2) house officers from programs other than that of the house officer in question, and similar levels of training.

H. Neither the house officer nor the institution shall be represented by legal counsel at the proceeding. However, each may produce witnesses and documentation on their behalf.

I. At the conclusion of the Fair Hearing, written findings and recommendations will be forwarded within ten (10) working days to the Dean of the School of Medicine who represents the final decision maker. At this time, the house officer or the department chair has the right to request a meeting with the Dean to review these issues. The Dean will render his final decision within ten
(10) working days of receipt of the Fair Hearing written findings and recommendations.

J. All proceedings and decisions of the Fair Hearing Board and the Dean of the School of Medicine shall be reported to the Graduate Medical Education Committee and the applicable program director in a confidential manner.

**Recommendation and Verification Letter Guideline:**

Fellows should alert attendings/faculty members and fellowship staff of any recommendation and/or verification letter requests with as much notice as possible. When requesting a letter, email the attending/faculty member and the fellowship coordinator with the following information: the reason for the request, the contact information (name, title, organization, address) for letter recipient(s), deadline for when the letter is needed, pertinent details the letter should include (or a rough draft of a letter), and method of delivery (return to fellow, email, or send via postal service). The faculty and staff of Tulane University Heart and Vascular Institute will try to accommodate all requests; however, any request made less than seven business days from the deadline may not be honored.

**Guidelines for Professional Attire (A Component of the Professional Competency)**

**Men**

1. Scrubs are appropriate attire only on call or while on procedurally oriented rotations.
2. Anytime men are on patient care rotations, dress should be professional, appropriate, and should include a necktie or bowtie unless it is a holiday or a weekend.
3. Any facial hair (beards or moustaches) should be kept neatly trimmed.
4. In the absence of a beard or moustache, men should be clean-shaven.
5. Hair should be kept clean, neat, and appropriately trimmed or cut.

**Women**

1. Scrubs are appropriate attire only on call or while on procedurally oriented rotations.
2. Anytime women are on patient care rotations, dress should be professional, appropriate, and conservative.

**Additional Information**

The web address listed below contains the Graduate Medical Education Policies & Procedures for Residents & Fellows Handbook (GME Handbook) for Tulane University School of Medicine. You also received a copy of the GME Handbook at the beginning of the year. If you need a more detailed explanation of the information found in this document or if a topic is not addressed; please check your copy of the GME Handbook or the website for more information.

http://www.som.tulane.edu/gme/resources_residents.htm
Appendix

Abbreviations

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On-Line Risk Management Course
http://www.massmed.org/Content/NavigationMenu2/Home/default.htm#promutual

Online Resources and Databases

1. ACGME, including a glossary of terms, program requirements, general competencies - http://www.acgme.org/acgmeweb/tabid/83/ProgramandInstitutionalGuidelines.aspx


4. Tulane University Rudolph Matas Library of the Health Sciences - http://matas.tulane.edu/ If you are ON campus, there is no need to sign on. If you are OFF campus, you need to sign on with the log on name and password you use to check your webmail to have access to books and full articles.

This site will give you among many other things, access to:

- PUBMED and some full articles
• OVID and some full articles. Sometimes you will need to have this site opened when you are trying to download articles from PUBMED
• UPTODATE: This site is available ONLY if you are ON-campus
• ACCESS MEDICINE: They have HURST’s The Heart, Current diagnosis and treatment in Cardiology, Cardiovascular Physiology, and many more
• MD CONSULT: They have BRAUNWALD, and many more

5. American College of Cardiology - [www.acc.org](http://www.acc.org) Information on scientific sessions, ACC courses, practice guidelines and includes Cardiosource for Institutions with a large variety of educational resources.

6. American Heart Association - [www.myamericanheart.org](http://www.myamericanheart.org) Information on research opportunities, practice guidelines, scientific sessions, AHA courses, patient education, etc.

7. ECG learning from Utah University - [http://ecg.utah.edu/](http://ecg.utah.edu/)

8. Medscape - [www.medscape.com](http://www.medscape.com) Free sign-in website with medicine information, some full articles, patient information, latest drugs related articles, cardiology information, overview of pathologies, treatment, images, and ECG’s. Some CME’s

9. epocrates online, an athenahealth service - [https://online.epocrates.com/](https://online.epocrates.com/) Free Sign-in website. Access to information on medications, dosages, side effects, contraindications. For a fee, an app can be downloaded it with access to tables, calculations, formularies

10. Medtronic Academy - [www.medtronicconnect.com](http://www.medtronicconnect.com) Free sign in, Medtronic physician info website with lectures, images, articles, patient info

11. Univadis, formerly Merck Medicus - [http://www.univadis.com/](http://www.univadis.com/) Free sign in, Merck website with lectures, images, Harrison’s online, Cecil’s, Braunwald’s Atlas of Internal Medicine, slides bank


## SECTION OF CARDIOLOGY PHONE LIST

**Mailing Address:**
Tulane University Heart & Vascular Institute  
1430 Tulane Avenue, 8548 (replacing SL48)  
New Orleans, LA 70112

**Main Phone:** (504) 988-5152  
7th Floor Fax: (504) 988-4237  
1st Floor Fax: (504) 988-9045  
Fellows' Room (1202J) (504) 988-1173

Call (504) 988-5263 to have any Tulane physician paged.

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<td>Cardiology Credentialing and Conferences</td>
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### Westbank Clinic Staff

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**Cardiology Fellowship (1202J and 1202M)**

**2015-2018**

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**2016-2019**

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**2017-2020**

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### Interventional Cardiology Fellowship

#### 2017-2018

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#### Clinical Contact Numbers

- TMC Cardiology Clinic: 988-6113
- TUHVI Westbank Cardiology Clinic 4201 Woodland Dr.: (504) 378-5080
- UMC Clinic: (504) 702-5700
- VA Clinic: (504) 553-2137
Fellow Leave Request Form

• Refer to the Policies and Procedures section of the Cardiovascular Disease Fellowship Handbook for information about vacation requests during specific rotations.
• Please obtain a Program Director signature and a Chief Fellow signature prior to submission

Requesting Fellow (Please Print): ________________________________

Signature of Requesting Fellow: ________________________________

Requested Leave Dates (Include Weekend Dates When No Call Is Requested):

Total No. of Days (Do Not Include Weekend Days):

Date Request Submitted: ________________________________

Type of Leave: □ Vacation □ Educational □ Medical □ Other (Please Specify)

Requesting Fellow, Please Complete:

□ Emergency Leave - Reason: ____________________________________________

Rotation during requested dates: __________________________________________

Coverage (of rotation) by: ________________________________ OR arranged by Chief Fellow □:

Signature of Attending on Service if Required: __________________________________________

Signature of Director: ________________________________

Signature of Chief Fellow: ________________________________

Night or Weekend Coverage: if applicable (emergency leave)

Date: __________________ Coverage by: Signature: __________________________________________

Requesting Fellow, Please Complete:

1 - VA Clinic Date(s):
□ If coverage arranged, covered by: __________________________________________

2 - ILH Clinic Date(s):
□ If coverage arranged, covered by: __________________________________________

3 - Conference Date(s):
□ If coverage arranged, covered by: __________________________________________ □ No Conference

Coordinator fields:
VA Clinic Canceled (date):
ILH Clinic Canceled (date):
Notes:

Added to Vacation Leave Log: ________________

Approved □

rev: 6/18/2017