

2021-2022
CURRICULUM FOR FELLOWSHIP IN
CARDIOVASCULAR DISEASES

UNIVERSITY OF OKLAHOMA
HEALTH SCIENCES CENTER

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I. EDUCATIONAL PROGRAM

I a. Core or General Competencies

Six areas of core or general competencies are outlined by ACGME:

1. Patient Care

Demonstrating compassionate, appropriate and effective for the treatment of health problems and promotion of health

2. Medical Knowledge

Understanding established and evolving biomedical, clinical and cognate sciences and application of this knowledge to patient care

3. Practice-based Learning and Improvement

Engaging in investigation and evaluation of one's own patient care practices, appraisal and assimilation of scientific evidence and improvements in patient care

4. Interpersonal and Communication Skills

Acquiring skills in effective information exchange and teaming with patients, their families and other health professionals

5. Professionalism

Manifesting through a commitment to carrying out professional responsibilities selflessly, adhering to ethical principles and sensitivity to diverse patient population

6. Systems-Based Practice

Following actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value

Training of cardiology fellows will incorporate the above ACGME principles.

I b. Evaluation

Evaluation of fellows will be done through:

- Monthly, end of rotation written evaluations by the attending physician
- Formative evaluation after individual procedure by supervising faculty
- Evaluations by nurses, case managers, students (if applicable) and patients that are part of the multisource feedback
- Yearly formal written in-training examination
- Observation of clinical procedures by a faculty member (formative feedback)
- End of training summative evaluation by program director
- In-Training examination (for second and third year fellows)

Evaluation of effectiveness of the teaching program will be done through:

- ABIM pass rate and specific performance data from the examination
- Feedback about the teaching program and faculty from the fellows after rotations
- Feedback from on-line survey of graduating fellows (done by GME office)
- Feedback from the yearly on-line ACGME Resident (fellow) survey
- Feedback from the yearly on-line ACGME Faculty survey

II. CURRICULAR FRAMEWORK FOR FELLOWSHIP IN CARDIOVASCULAR DISEASES

II a. Objectives

The objective of the cardiology fellowship program is to provide training and experience in the evaluation and management of a variety of acute and chronic cardiovascular conditions.

Included in this list are:

- chronic coronary artery disease
- congestive heart failure
- acute coronary syndromes
- acute myocardial infarction
- arrhythmias
- lipid disorders and prevention
- hypertension
- cardiomyopathy
- valvular heart disease
- pulmonary heart disease
- vascular disease
- infectious and inflammatory heart disease
- adult congenital heart disease
- acute care cardiology
- out-patient and ambulatory cardiology

The training and experience acquired during the training will be sufficient for the level of the specialist. The training will be aimed at acquiring both the knowledge base as well as technological skills. Pathophysiology, pathogenesis, natural history, and diagnosis will be stressed.

The goal of the training program is to provide opportunities for the fellows to develop clinical competence in the field of adult cardiology.

A. Clinical Experience

1. **Patient Population**

Clinical experience includes opportunities to observe, manage and judge the effectiveness of therapeutic programs in patients with a wide variety of adult cardiovascular disorders on both an inpatient and an outpatient basis. The fellow will be given opportunities to assume continuing and progressively more independent responsibility for both acute and chronically ill patients to learn the natural history of cardiovascular disease.

2. **Ambulatory Medicine**

Continuing care experience in the ambulatory care setting will occur at two half-day clinics each week during the 36 months of training.

3. **Inpatient Care**

There will be at least 8 months of non-laboratory clinical practice activities (e.g., consultations, CCU, PCCU, clinical electives in Thoracic Surgery and Adult Congenital/Pediatric Cardiology).

4. Special Clinical Experience

There will be a minimum of 24 months of clinical training, including inpatient and special rotations:

- a. Minimum of four (4) months of cardiac catheterization
- b. Minimum of four (4) months of noninvasive cardiac evaluations including, exercise stress test, ECG interpretation, ambulatory ECG recording, echocardiography, and nuclear cardiology
- c. Two (2) months of combined electrophysiology and pacemaker clinical experience

B. Technical and Other Skills

1. Training program will provide experience for the fellow in the performance and interpretation of:

- a. History and physical examination
- b. Cardiopulmonary resuscitation and advanced cardiac life support
- c. Elective cardioversion
- d. Bedside right heart catheterization
- e. Insertion and management of temporary pacemakers
- f. Over 100 right and left heart catheterizations including coronary arteriography
- g. Over 50 exercise stress tests
- h. Over 150 echocardiography studies and interpretation

2. Training program will provide exposure/experience for the fellow with performance and/or interpretation of:

- a. Pericardiocentesis
- b. Programming and follow-up of permanent pacemakers
- c. Intracardiac electrophysiologic studies
- d. Intra-aortic balloon counterpulsation

3. Training program will provide experience for fellows in the interpretation of:

- a. Chest x-rays
- b. Electrocardiogram
- c. Ambulatory ECG recording
- d. Radionuclide studies of myocardial function and perfusion

C. Formal Instruction

Training program will provide instruction and knowledge in:

1. Basic science including

- a. Cardiovascular anatomy
- b. Cardiovascular physiology
- c. Cardiovascular metabolism
- d. Molecular biology of the cardiovascular system
- e. Cardiovascular pharmacology
- f. Cardiovascular pathology

2. Prevention of cardiovascular disease including

- a. Epidemiology and biostatistics
- b. Risk factors
- c. Lipid disorders

- 3. Evaluation and management of patients with**
 - a. Coronary artery disease and its manifestations and complications
 - b. Arrhythmias
 - c. Hypertension
 - d. Cardiomyopathy
 - e. Valvular heart disease
 - f. Pericardial disease
 - g. Pulmonary heart disease
 - h. Peripheral artery disease
 - i. Cerebrovascular disease
 - j. Heart disease in pregnancy
 - k. Adult congenital heart disease
 - l. Complications of therapy

- 4. Management of**
 - a. Acute and chronic congestive heart failure
 - b. Acute myocardial infarction and other acute ischemic syndromes
 - c. Acute and chronic arrhythmias
 - d. Preoperative and postoperative patients
 - e. Cardiac transplant patients

- 5. Exposure to Diagnostic techniques including**
 - a. Cardiac Magnetic Resonance Imaging
 - b. Cardiac Computed tomography
 - c. Nuclear techniques including Positron emission tomography

D. Research/Scholarly Activity Experience

Research/Scholarly activity is a required component of fellowship training. ACGME requires meaningful research experience for the cardiology fellow. Fellow will be expected to have completed a research or scholarly project and presented the results locally and/or nationally and written a manuscript based on the project.

II b. Description of the Rotations & Evaluation of Various Levels of Entrustment

A. Coronary Care Unit

Educational Goals and Associated Curricular Competencies:

1. Know the assessment and management of acute coronary syndromes (STEMI, Non-STEMI, and Unstable Angina).
(Core competencies: Patient Care, Medical Knowledge, Interpersonal and Communication Skills, Professionalism)
2. Know the assessment and management of hemodynamic instability.
(Core competencies: Patient Care, Medical Knowledge, Interpersonal and Communication Skills, Professionalism)
3. Develop the skills needed to use the noninvasive laboratory and the cardiac catheterization laboratory in the most cost effective and appropriate manner.
(Core competencies: Patient Care, Medical Knowledge, Systems Based Practice)
4. Know the indications and comparative merits of catheter-based revascularization vs. surgical revascularization in various forms of ischemic and valvular heart disease.
(Core competencies: Patient Care, Medical Knowledge)
5. Know the indication, monitoring, troubleshooting, and clinical application of data derived from intra-aortic balloon pump, pulmonary artery catheters, mechanical circulatory devices and temporary pacemakers.
(Core competencies: Patient Care, Medical Knowledge, Systems Based Practice)
6. Know the emergency management of various types of tachy- and bradyarrhythmias. *(Core competencies: Patient Care, Medical Knowledge)*
7. Know the basics of interdisciplinary and team management of cardiovascular patients and transitions of care.
(Core competencies: Patient Care, Interpersonal and Communication Skills, and System Based Practice)

Fellow Responsibilities:

First Year Fellow (OUMC CCU):

1. Assist on "work rounds" with the housestaff on the CCU patients in predominantly an advisory role.
2. Discuss potential management problems with the attending early in the day (before rounds), including decisions to perform invasive procedures.
3. Interact with the cardiac catheterization team, cardiac surgery team and the stress & echo lab to organize care of patients as well as interpretation of new diagnostic information.
4. Act as liaison between the CCU and cardiology attending and referral sources of patient admissions to ensure smooth flow.

5. Review angiograms and echocardiograms with housestaff and attending on cardiology inpatients. Correlate angiographic and clinical findings and discuss the impact of angiographic findings on patient management with attending and housestaff.
6. Function as a teacher for the ward team. Structure of the ward team is as follows: Attending physician in charge, CCU fellow, resident, intern, physician assistant, pharmacist (Pharm.D), case manager, social worker. Residents report to the fellow and the fellow reports to the attending.
7. Oversee safe and effective patient hand off processes and transitions of care as per hospital and university directives.

Fellow Assignments:

OU Medical Center, Coronary Intensive Care Unit

Mix of Diseases and Patient Characteristics:

- Acute coronary syndromes
- Arrhythmias (supraventricular and ventricular)
- Sudden cardiac death
- Hypotensive syndromes
- Bradyarrhythmias
- Acute decompensated heart failure
- Pericardial effusion and tamponade
- Implantable cardiac device infections
- Valvular endocarditis
- Acute complications following elective PCI, device implantation/extraction, radiofrequency catheter ablation

Teaching Methods:

Ward rounds
Didactic lectures
Case conference (Second Wednesdays)
Monthly quality improvement meeting (fourth Monday)

Procedure Skills to be Acquired and Documented:

Pulmonary artery catheterization (insertion and daily hemodynamic calculations/interpretation)
Temporary transvenous pacing
Cardioversion

Interaction with the Internal Medicine/Family Medicine Resident and Responsibilities of the CCU resident:

1. Assess patients admitted to the CCU and cardiology wards (including data collection, physical examination, write ups, test ordering, assessment of information from tests); discuss patient information with the cardiology fellow and subsequently the cardiology attending;

2. Prepare for daily ward rounds;
3. Discharge patients and ensure safe transitions of care;
4. Respond to calls from Emergency Department for consultations and patient dispositions;
5. Direct the patient hand off process to ensure safety and completeness;
6. Serve as the immediate supervisor and resource for the internal medicine or family medicine resident assigned to the team.

Faculty Supervision:

CCU attending will make ward rounds daily with the ward team and supervise performance of the CCU fellow. CCU attending will provide the overview of the rotation as well as feedback at the end of the rotation. A written formal evaluation that incorporates the 6 core competencies as well as specific competencies involved in the rotation will be generated. Any procedure logs generated will require the attending’s signature.

Suggested Reading:

Textbook of Cardiovascular Medicine, Editor: Eric J. Topol, *Lippincott-Raven*

Heart Disease: A Textbook of Cardiovascular Medicine, Editor: Eugene Braunwald, *W.B. Saunders Company*

Hurst’s The Heart, Editors: Schlant, Alexander, *McGraw-Hill, Inc*

Mayo Clinic Cardiology Board Review (DVD) series

ACCF Cardiology Board Review series

ACC/AHA Clinical Practice Guidelines.

<http://professional.heart.org/professional/GuidelinesStatements/searchresults>.

Evaluation:

- End of rotation written evaluation by faculty
- Multisource Feedback
- The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

Procedures Approved in the CCU for Cardiology Fellows:

Procedures	P1	P2	P3	P4	P5	P6	P7	Faculty
Arterial Puncture & Cannulation.	S	S	S	A	A	A	A	A
Cardiac Pacemaker (Transvenous)	S	S	S	A	A	A	A	A
Cardioversion (Elective)	S	S	S	A	A	A	A	A
Echocardiography	-	-	-	S	S	S	-	A

ECG Interpretation (Including ETT)	S	S	S	A	A	A	A	A
Endotracheal Intubation	S	S	S	A	A	A	A	A
Paracentesis, Abdominal	S	S	S	A	A	A	A	A
Pericardiocentesis (non-emergent)	S	S	S	S	S	S	S	A
Placement of IABP	-	-	-	S	S	S	S	A
Respirator Management	S	S	S	A	A	A	A	A
Subclavian Puncture/Internal Jugular Line	S	S	S	A	A	A	A	A
Swan-Ganz Catheterization	S	S	S	A	A	A	A	A
Thoracentesis	S	S	S	A	A	A	A	A
Thrombolytic Therapy	S	S	S	A	A	A	A	A
Transesophageal Echo	S	S	S	S	S	S	-	A
S = Only with Supervision A= Approved P4- first year fellow P5- second year fellow P6- third year fellow P7- fourth year fellow								

Core Competencies (Education and Evaluation) during this rotation:

<u>Competency</u>	<u>Methodology for Education/Training</u>	<u>Methodology for Testing/Evaluation</u>
1. Patient Care	CCU Rounds (bedside) Unit Consults Monthly M & M Conference	Global rating CCU Case Conference Presentation M & M Presentations Multisource feedback
2. Medical Knowledge	CCU Rounds (bedside) Unit Consults	Global rating CCU Case Conference Presentation Multisource feedback In-Training Exam
3. Practice-based Learning & Improvement	CCU Rounds (bedside) Unit Consults Monthly QA Conference	Global Rating Multisource feedback
4. Interpersonal & Communication Skills	CCU Rounds (bedside) Unit Consults	Global Rating Multisource feedback
5. Professionalism	CCU Rounds (bedside) Unit Consults	Global Rating Multisource feedback
6. System based Practice	CCU Rounds Unit Consults Handouts about how to access services	Global Rating Multisource feedback

Procedure to Follow When Temporary Pacing is Needed:

1. In general, the interventional cardiology team will perform all temporary pacemaker elective or urgent/emergent, if available (not scrubbed in another procedure).
2. If the interventional attending is occupied and the patient is unstable and cannot wait, the EP attending (or CICU attending, if they feel comfortable) will be available to help with the procedure in the cath lab or at bedside. The fellow will be required to make a phone call to the EP attendings or the EP lab.
3. While it remains the best practice to do these procedures in the cardiac cath lab to decrease risk of complications, we as a team would attempt to do as many as we can at bedside to give the fellows the experience needed to perform such procedures without the use of fluoroscopy.

In any situation, the primary team, including fellows/residents, will need to make sure the following criteria are met for every patient in need of a temporary pacemaker:

1. Check labs (electrolytes, H&H, platelets, INR) and EKG and have the information ready. While we do not need to wait for such labs to perform the procedure, it is important to make sure labs are available or have been sent.
2. Temporary transcutaneous pacing should be attempted when possible.
3. Obtain informed consent (fellow, not resident) from the patient and/or a family member, especially if the cath lab team is not readily available to do so.
4. If there is any delay in taking the patient to the cath lab, obtaining ultrasound-guided right internal jugular access and placing a 4 or 5 French sheath that can be obtained from the cardiac cath lab would help expedite the procedure, especially if it is going to be done at bedside. Placing the sheath is usually the most important step of this procedure. Doing it using ultrasound is much easier, safer, and faster.
5. If the procedure is being performed at bedside after the IJ sheath is placed, have the following equipment ready:
 - 4F balloon-tipped temporary pacemaker which can be obtained from the cath lab or with the help of the supervisor in the unit. There is also a pacemaker box in the CCU that should contain this equipment.
 - Pacemaker wires.
 - Pacemaker box (make sure it is functional and the battery works).
 - Drapes and sterile equipment to perform the procedure at bedside per the ER/CICU/MICU protocol.

4. **II b. Description of the Rotations**

B. Consult Service

Educational Goals and Associated Competencies:

1. Know the role of cardiologist as a consultant when complex cardiac disease is encountered in surgical, obstetric or general medicine practice.
(Core Competencies: Patient care, medical knowledge, professionalism, practice based learning and improvement, interpersonal & communication skills and system based practice)
2. Gain an increased understanding of clinical diagnosis and management of cardiovascular disease in the inpatient and outpatient settings.
(Core competencies: Patient care, medical knowledge, system based practice)

Fellow Responsibilities:

First, Second and Third Year Fellows:

1. Evaluate consult patients and discuss their management with the cardiology attending. Follow the patients until cardiac problems are stable and discuss the management with the attending daily. Plan and organize orderly sign-off when appropriate.
2. Evaluate and help with the disposition of the patients seen in the Emergency Department
3. Organize special procedures for the consult patients with the cath lab, echo lab, and EP lab whenever necessary.
4. Second and third year fellows will be the backup resource for supervising nuclear studies during a few months each year

Fellow Assignments:

OU Medical Center consults are covered by the consult fellow assigned to OUMC; Unit consults are covered by the OUMC CCU fellow.

DVA Medical Center consults are covered by the Consult fellow.

Mix of Diseases and Patient Characteristics:

- Acute ischemic syndromes
- Acute myocardial infarction
- Arrhythmias (supraventricular and ventricular)
- Sudden cardiac death
- Hypotensive syndromes
- Bradyarrhythmias
- Congestive heart failure
- Chest pain syndromes
- Pericardial effusion and tamponade

Teaching Methods:

Rounds
Reading assignments

Procedural Skills to be acquired & procedure logs to be maintained:

N/A

Faculty Supervision:

Consult service attending will make ward rounds daily with the consult fellow and the nurse practitioner and supervise performance of the fellow. Attending will provide the overview of the rotation as well as feedback at the end of the rotation. A written formal evaluation that incorporates the 6 core competencies will be generated

Interaction with the Internal Medicine Resident & Responsibilities of the Internal Medicine Resident on the Consult Service (VA only):

1. Assess patients referred for cardiology consult; discuss patients with the cardiology fellow and cardiology attending
2. Provide supervision and teaching to the residents assigned to the consult service when applicable
3. Cardiology fellow is the immediate supervisor and resource for the internal medicine resident assigned to the team. Fellow also provides supervision and teach fourth year medical students whenever they are present in the team.

Suggested Reading:

Heart Disease: A Textbook of Cardiovascular Medicine, Editor: Eugene Braunwald, *W.B. Saunders Company*

Hurst's The Heart, Editors: Schlant, Alexander, *McGraw-Hill, Inc*

Mayo Clinic Cardiology Review (DVD) series

Method of Evaluation:

End of rotation written evaluation by faculty. The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

II b. Description of the Rotations

C. Echocardiography

Educational Goals and Associated Competencies:

1. Selects patients for echocardiography (initial and follow-up) based on accepted current guidelines.
(Core Competencies: Medical Knowledge, Patient Care)
2. Performs scanning, comprehensive analysis and reporting of TTEs.
(Core Competencies: Medical Knowledge, Patient Care & procedure skills)
3. Performs TEEs, conducts comprehensive analysis and reporting of TEEs; understands and follows contraindications to esophageal intubation and moderate/conscious sedation.
(Core Competencies: Medical Knowledge, Patient Care and procedure skills)
4. Performs stress echocardiography, conducts comprehensive analysis and reporting of stress echocardiograms.
(Core Competencies: Medical Knowledge, Patient Care and procedure skills)
5. Applies Appropriate Use Criteria (AUC) and other guidelines-based principles to patient selection for echocardiography.
(Core Competencies: Medical Knowledge, Patient Care)
6. Knows the role, cost comparison and relative value of competing technologies (cardiac CT, cardiac MR and nuclear studies).
(Core Competencies: Medical Knowledge, Patient Care)
7. Knows the basic troubleshooting of the echocardiography machine and maintenance of the TEE probe.
(Core Competencies: Professionalism, Practice-Based Learning and Improvement)

Fellow Responsibilities:

First Year Fellow:

1. Perform 150 echocardiograms under the supervision of a qualified sonographer (RDMS or RDCS) and/or the attending echocardiographer. Goals of hands-on training are:
 - Knowledge of the tomographic cardiac anatomy and the 3D relationship of different tomographic image planes.
 - Knowledge of basic image and flow acquisition parameters and the effect of instrumentation settings on data quality.
 - Recognition and avoidance of ultrasound artifacts.
2. Interpret 300 echocardiograms under the supervision of an appropriately qualified physician.
3. Perform stress (exercise and pharmacologic) echocardiograms and participate in their interpretation.

4. Correlate echocardiographic findings with physical examination findings and other clinical data. Interact with referring physicians when echocardiograms are requested and when further interpretation of echocardiographic results is needed.
5. Read a standard textbook on echocardiography and study other recommended articles.
6. Prepare and help present cases as needed at the weekly echocardiography conference.
7. Communicate with referring physicians any critical information as necessary.
8. Work effectively with the echo lab team to ensure patient safety and an error free care operation.

Second and Third Year Fellow:

1. Participate in the evaluation, preparation and performance of patients undergoing transesophageal echocardiograms.
2. Correlate echocardiographic findings with physical examination findings and other clinical data. Interact with referring physicians when echocardiograms are requested and when further interpretation of echocardiographic results is needed.
3. Continue to read a standard textbook on echocardiography and study other recommended articles.
4. Prepare and help present cases as needed at the weekly echocardiography conference.
5. Communicate critical information with referring physicians as needed.
6. Work effectively with the echo lab team to ensure patient safety and an error free care operation

Fellow Assignments:

OUMC Echo Lab
VA Medical Center Echo Lab

Mix of Disease and Patient Characteristics:

- Coronary artery disease (acute and chronic)
- Valvular heart disease
- Pulmonary heart disease
- Hypertensive heart disease
- Congenital heart disease
- Prosthetic valve surgery
- Pericardial disease
- Traumatic heart disease
- Aortic disease
- Heart Failure

Faculty Supervision and Method of Evaluation:

Echo faculty will provide guidance and supervision in patient care issues. They will also supervise reading of the echocardiographic studies. Faculty will provide formative feedback after each procedure (debriefing). Please refer to the attached evaluation tool that will be utilized by the faculty for this rotation.

Teaching Methods:

- Scanning at the bedside (transthoracic, stress and transesophageal echo)
- Reading of echocardiographic studies
- Formative feedback after TEEs
- Didactic instruction in the weekly echocardiography conferences
(Fridays 7.30 to 8.30 am)

Suggested Reading:

- The Echo Manual, by Jae K. Oh, James B. Seward and A. Jamil Tajik, *Lippincott Williams & Wilkins* Third edition
- ASE’s Comprehensive Echocardiography Second Edition 2016, by *Lang, Goldstein, Kronzon, Khanderia and Mor-Avi.*

Graded Responsibilities and Performance Improvement in Echocardiography:

Entrustable Professional Activities in Echocardiography at the end of Training:

1. Selects patients for echocardiography (initial and follow-up) based on accepted current guidelines
2. Performs comprehensive analysis and reporting of TTEs
3. Performs TEEs, conducts comprehensive analysis and reporting of TEEs; understands and follows contraindications to esophageal intubation and moderate/ conscious sedation
4. Performs stress echocardiography, conducts comprehensive analysis and reporting of stress echocardiograms
5. Understands the role, cost comparison and relative value of competing technologies (cardiac CT, cardiac MR and nuclear studies)
6. Understands basic trouble shooting of the echocardiography machine and maintenance of the TEE probe

Milestones:

Approximate Time

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Pre-reads correctly critical TTE findings <ol style="list-style-type: none"> a. Tamponade b. LV dysfunction and wall motion abnormalities c. Cardiac masses d. Acute RV failure e. Aortic dissection f. Severe valvular lesions 2. Performs esophageal intubation safely 3. Performs TEEs and obtains standard views correctly 4. Performs and pre-reads stress echocardiograms correctly | <p>2 years</p> <p>1-2 years</p> <p>First year</p> <p>1-2 years</p> <p>2-3 years</p> <p>2-3 years</p> <p>2 years</p> <p>2-3 years</p> <p>2 years</p> |
|--|---|

Milestones:

- | | |
|---|------------------------------------|
| <ol style="list-style-type: none"> 1. Develops concept of three-dimensional cardiac anatomy 2. Selects patients for TTE based on current guidelines | <p>1-3 years</p> <p>First year</p> |
|---|------------------------------------|

3. Understands typical findings in tamponade, LV dysfunction, cardiac masses, acute RV strain, severe valvular lesions 1- 2 years

Assessment of development of Landmarks and Milestones:

1. Monthly assessment (formative)
2. Observation (direct)
3. In-training examination (once a year)

Echo board examinations (National Board of Echocardiography):

Administered in July each year

Please obtain prior approval and guidance from Program Director

Method of Evaluation:

- End of rotation written evaluation by faculty
- Multisource evaluation
- The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

II b. Description of the Rotations

D. Heart Station & Stress Testing

Educational Purpose and Associated Competencies:

1. Know the interpretation of 12-lead electrocardiograms.
(Core Competencies: Medical Knowledge)
2. Know and interpret 24-hour ECG's and rhythm strips accurately.
(Core Competencies: Medical Knowledge)
3. Know indications for performance of exercise treadmill tests and be able to interpret the results.
(Core Competencies: Procedure Skills, Professionalism, Systems-Based Practice)
4. Know the indications, performance and interpretation of tilt table testing.
(Core competencies: Medical Knowledge, Procedure Skills, Practice-Based Learning and Improvement, Systems-Based Practice)

Fellow Responsibilities:

First Year only:

1. Perform scheduled treadmill exercise tests and review the results with an Attending
2. Interpret 24-hour ECGs with review by an Attending on a regularly scheduled basis
3. Interpret ~ 3500 EKGs and discuss the findings with an Attending.
4. Participate and interpret nuclear myocardial perfusion studies and radionuclide ventriculograms (goal: 25 myocardial perfusion studies and 50 RNVGs).
5. Observe and perform quality control under the supervision of Nuclear Medicine Technologist (goal: 10 studies)

Fellow Assignments:

OU Medical Center
VA Medical Center

Mix of Diseases and Patient Characteristics:

A variety of patients with cardiovascular conditions will be available, including,

- Acute forms of coronary artery disease
- Chronic coronary artery disease
- Arrhythmias
- Hypertension
- Cardiomyopathy

- Valvular heart disease
- Pulmonary heart disease
- Infectious and inflammatory heart disease
- Adult congenital heart disease

Teaching Methods:

Discussion with attending
 Monthly EKG conferences
 Reading of nuclear studies daily in Nuclear Medicine

Procedural Skills to be Acquired and Documented:

Stress testing
 Adenosine/Regadenoson stress testing (Myocardial Perfusion Imaging)
 Holter monitor analysis
 Tilt table testing
 EKG reading

Suggested Reading:

Heart Disease: A Textbook of Cardiovascular Medicine, Editor: Eugene Braunwald, *W.B. Saunders Company*

Hurst's The Heart, Editors: Schlant, Alexander, *McGraw-Hill, Inc*

Mayo Clinic Cardiology Review (DVD) series

The Complete Guide to ECGs. O'Keefe JH, Hammill SC, Freed MS, Pogwizd SM. *Physician's Press*

Faculty Supervision and Method of Evaluation:

Cardiology faculty will oversee selected EKG readings with the first-year fellow. EP faculty will be available as needed for complicated cases.

Evaluation of skills will be done by the End of rotation written evaluation by faculty as well as an in-training examination at the end of the year. The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

II b. Description of the Rotations

E. Cardiac Catheterization Laboratories

Educational Purpose and Associated Competencies:

1. Know normal and abnormal coronary artery anatomy, physiology and pathology.
(Core competencies: Medical Knowledge, Patient Care)
2. Know the principles of radiographic image formation, image planes relative to cardiac anatomy, radiographic instrumentation and factors that affect image quality.
(Core competencies: Medical Knowledge, Patient Care, Systems-Based Practice)
3. Know radiation safety issues and techniques to minimize radiation exposure.
(Core competencies: Medical Knowledge, Patient Care)
4. Know the relationship of angiographic findings to other clinical parameters, indication for angiography and alternate diagnostic approaches.
(Core competencies: Medical Knowledge, Patient Care, Professionalism, Systems-Based Practice)
5. Perform and interpret left and right heart catheterization, pericardiocentesis, and placement of intra-aortic balloon pump & temporary pacemakers and other invasive procedures used in the diagnosis and management of cardiovascular disease.
(Core competencies: Medical Knowledge, Patient Care, Systems-Based Practice, Practice-Based Learning and Improvement)
6. Incorporate patient safety and prevention of errors in daily practice.
(Core competencies: Patient Care, Professionalism)
7. Work effectively within the multi-disciplinary team.
(Core competencies: Systems-Based Practice, Professionalism, Interpersonal and Communication Skills)

Fellow Duties:

First Year:

1. Evaluate and perform assessment of all patients scheduled for cath lab procedures the following day. Obtain informed consent and "sign up" the patient.
2. Apply the Appropriate Use Criteria (AUC) to patient selection.
3. Discuss with the cath attending the cath patients scheduled for the following day and formulate a plan of action before and during the procedure.
4. Perform and report at least 100 procedures. Discuss the hemodynamic and angiographic findings with the cath attending and generate full reports within 24 hours.
5. Follow up on the patient in the evening of their procedure as well as the next morning to look for complications.

6. Communicate with the coronary care unit team or referring physicians for effective hand off and transition of care.
7. Present patients and cath data in the cath conference. Present assigned didactic topics in the cath conference.
8. Observe and participate in interventional procedures.

Second Year:

1. Evaluate and perform assessment in concert with the first-year fellow of all patients scheduled for cath lab procedures the following day.
2. Discuss the patient for cath the following day with the first year fellow (if involved) and the attending and formulate the plan of action during the procedure.
3. Perform and maintain log book for all procedures performed. Discuss the hemodynamic and angiographic data with the cath attending and generate full reports within 24 hours.
4. Follow up evaluation of the patient after cath in the evening of cath as well as next morning to look for complications.
5. Communicate with the coronary care unit team or referring physicians for effective hand off and transition of care.
6. Present patients and cath data in the cath conference. Present assigned didactic topics in the cath conference.
7. Observe and participate in interventional procedures.

Third Year:

1. Collaborate with the first/second year fellow in evaluating and perform assessment of all patients scheduled for cath lab procedures the following day or same day for outpatients. The third-year fellow should be a source of education to the junior fellows.
2. Discuss the patient for cath the following day with the junior fellows and the cath attending and formulate the plan of action during the procedure.
3. Perform and maintain logbook of all procedures. Discuss the hemodynamic and angiographic findings with the cath attending and generate full reports within 24 hours.
4. In conjunction with the junior fellows ensure follow up evaluation of the patient after cath in the evening of cath as well as next morning to look for complications is performed.
5. Communicate with the coronary care unit team or referring physicians for effective hand off and transition of care.
6. Present patients and cath data in the cath conference. Present assigned didactic topics in the cath conference.
7. Observe and participate in interventional procedures

Fellow Assignments:

OU Medical Center, Cath Lab
VA Medical Center, Cath Lab

Mix of Diseases and Patient Characteristics:

- Coronary artery disease (acute and chronic)
- Valvular heart disease
- Pulmonary heart disease
- Hypertensive heart disease
- Congenital heart disease
- Status- post prosthetic valve surgery
- Pericardial disease
- Post-cardiac transplantation status
- PAD
- Venous Disease

Teaching Methods:

Prior to procedures (discuss patients and AUC)
During cath procedures (proctoring)
During reporting of cath studies
Tuesday morning cath conference

Procedural skills to be acquired and documented:

Right heart catheterization
Left heart catheterization
Coronary arteriography
Left ventriculography
Invasive hemodynamics
Pericardiocentesis
Balloon pump insertion
Myocardial biopsy
Temporary pacemaker insertion
Diagnostic peripheral angiography

Suggested Reading:

Arterial and Venous Access in the Cardiac Catheterization Lab. Mazen Abu-Fadel (editor).
Rutgers University Press (2016)

Cardiac Catheterization, Angiography, and Intervention. William Grossman, Donald S. Baim.
Lea & Febiger

Hemodynamic Rounds (Paperback) by Morton J. Kern. Wiley-Liss

The Cardiac Catheterization Handbook (4th Edition) (Paperback)
by Morton J. Kern. Mosby

Attending Supervision and Method of Evaluation:

End of rotation evaluation by faculty

Multisource evaluation

Formative evaluation and feedback by faculty after a heart catheterization procedure

End of year in training examination

The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

Interaction between Cardiology Fellow and the Interventional Cardiology Fellow and Line of Supervision:

1. The Interventional fellow collaborates with the first/second or third year fellow on the catheterization rotation in evaluating and performing assessment of all patients scheduled for cath lab procedures the following day or same day for outpatients. The interventional fellow is a valuable secondary resource for the education of junior fellows.
2. The Interventional fellow discusses the patient for cath the following day with the junior fellows and the cath attending and formulates the plan of action both for pretreatment strategies and formulates a therapeutic plan during the procedure.
3. In conjunction with the junior fellows the Interventional fellow ensures follow up evaluation of the patient after cath in the evening of cath as well as next morning to look for complications and report these in accordance with ACC guidelines to the cath lab secretaries. This is to allow appropriate performance improvement.
4. Interventional fellow maintains a collegial, mentoring working relationship with the cardiovascular fellows. Interventional fellow is not permitted to ask cardiovascular fellows for coverage of his/her duties at any time.

II b. Description of the Rotations

F. Pacing Rotation for General Cardiology (Non-EP) Fellows

Educational Goals and Associated Competencies:

1. Know the basic principles involved in pacing (definitions, modes of pacing, thresholds and output, impedance, various modes of pacing).
(Core competencies: Medical Knowledge, Patient Care, Systems-Based Practice, Professionalism)
2. Know the current indications of temporary and permanent pacing.
(Core competencies: Medical Knowledge, Patient Care)
3. Know the principles of pacemaker and CIED interrogation.
(Core competencies: Medical Knowledge, Patient Care, Procedure Skills)
4. Know how to interrogate and program CIEDs.
(Core competencies: Medical Knowledge, Patient Care, Procedure Skills)
5. Be able to assess the patient with permanent pacemaker and CIED during outpatient follow-up.
(Core competencies: Medical Knowledge, Patient Care, Procedure Skills)
6. Be able to assess complications of permanent pacemakers and CIEDs.
(Core competencies: Medical Knowledge, Patient Care, Professionalism, Procedure Skills)

Fellow Responsibilities:

Second year and third year:

1. Fellow will assess patients referred for consultation to the pacing service and discuss management plans with the pacing attending.
2. Fellow will scrub in on pacemaker implantation procedures.
3. Fellow will work with the pacemaker service nurse/PA and attending to learn pacemaker programming and troubleshooting.
4. Fellow will participate in the follow-up of patients with permanent pacemakers.

Fellow Assignments:

OU Medical Center
VA Medical Center

Mix of Diseases and Patient Characteristics:

- Patients with symptomatic bradycardia
- Patients with pacemakers

Teaching Methods:

Bedside instruction regarding pacemaker and CIED programming (proctoring)
Cath lab instruction during pacemaker and CIED implantation

Procedural skills to be acquired:

Pacemaker (CIED) programming
Troubleshooting of pacemakers and CIEDs

Suggested Reading:

Cardiac Pacing. Kenneth A. Ellenbogen, *Blackwell Science*

Method of Evaluation:

End of rotation written evaluation by faculty. The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

II b. Description of the Rotations

G. Fellow Research and Scholarly Activities

Educational Objectives:

Research and scholarly activities are required components of fellowship training. ACGME requires meaningful research experience for the cardiology fellow. Fellow will be expected to have completed a small research project during the first year of fellowship (e.g. a case report) and presented the results at the Stewart Wolf Housestaff Research Day, Cardiology Fellows' Research Day and/or ACC/ACP Oklahoma Chapter meetings. Fellow will be expected to conduct a larger research project during the second and third years. This will lead to presentation at a national scientific meeting and a manuscript.

Educational Goals and Associated Competencies:

1. Know the basics of research methodology.
(Core Competencies: Medical Knowledge, Practice-Based Learning and Improvement)
2. Write up a new project or continue an ongoing prospective or retrospective study.
(Core Competencies: Medical Knowledge, Practice-Based Learning and Improvement)
3. Work towards writing a manuscript based on the research project, and also work on improving skills in writing manuscripts.
(Core Competencies: Medical Knowledge, Practice-Based Learning and Improvement)

Fellow Responsibilities and Expectations:

1. Fellow will work with a research mentor and develop a project for investigation.
(Core competencies: Medical knowledge)
2. Fellow will acquire, analyze and present data from the research project.
(Core competencies: medical knowledge)
3. Fellow will present data from research project at the housestaff research day of OUHSC.
(Core competencies: Medical knowledge)
4. Fellow will write a paper based on the research project.
(Core competencies: Medical knowledge, professionalism)
5. Fellow will develop an understanding of the basic concepts of research methodology.
(Core competencies: Medical knowledge)

First Year Fellow:

Work towards completing a case report

Second and Third Year Fellow:

Write a project description, present at the research conference, obtain IRB approval, collect and analyze data and prepare abstract and manuscript.

Fellows Assignment:

Each fellow will have a research mentor who would advise the fellow at various stages of the research project and facilitate the completion of the project. The fellow will present the research proposal at the fellow's research conference. At the completion of the study, fellow will present the data again at the fellow's research conference. There will be a total of three to six months of research time available during fellowship training. Research months might run concurrent with another lighter rotation.

Method of Evaluation:

End of rotation written evaluation by faculty. The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

Suggested Reading:

Designing Clinical Research by Hulley SB, Cummings SR, Browner WS, Grady D, Hearst Newman TB.
Lippincott Williams & Wilkins Publishers

II b. Description of the Rotations

H. Cardiology Fellows' Ambulatory Clinics

Educational Goals and Associated Competencies:

1. Know the management of outpatient cardiac patients.
(Core competencies: Medical Knowledge, Patient Care, Systems-Based Practice, Practice-Based Learning and Improvement, Professionalism, Interpersonal and Communication Skills)
2. Know the outpatient assessment, formulation of diagnostic testing and therapy procedures.
(Core competencies: Medical Knowledge, Patient Care, Systems-Based Practice, Practice-Based Learning and Improvement)
3. Know how to effectively coordinate care between inpatient and outpatient services.
(Core competencies: Medical Knowledge, Patient Care, Systems-Based Practice, Practice-Based Learning and Improvement, Professionalism)

Educational Purpose and Associated Competencies:

Clinic experience offers the fellows an opportunity to evaluate patients with cardiac disease after the acute phase of illness is over and to acquire experience with the assessment and management of chronic cardiac conditions. This experience will cover patients with multiple types of clinical problems including:

- Coronary artery disease
- Valvular heart disease
- Hypertensive heart disease
- Congestive heart failure
- Adult congenital heart disease
- Suspected heart disease in patients with cardiac risk factors
- Risk factor modification
- Pre-operative evaluation of patients with heart disease

Clinic Description:

There will be two half-day clinics, one each at the OU Medical Center and VA Medical Center. Fellows are excused from the OUMC Clinic during their CCU rotations at OUMC and Consults rotations at VA.

OU Fellow Clinic: Room 624, Presbyterian Prof. Bldg., Tuesdays – 1:00 pm to 4:30 pm.

VA Medical Center Fellow Clinic: VA 5th Floor, Thursdays - The morning clinic is from 8:00 am to 12:00 pm. The afternoon clinic is from 12:30 pm to 4:30 pm. See rotation schedule for AM/PM assignments.

Fellow Responsibilities:

OU Medical Center Clinic: Fellow will assess, investigate and treat a panel of patients during the three-year fellowship training. Fellow will be responsible for the management of cardiac problems of these patients, including follow-up of the results of tests and responding to patient phone calls.

VA Medical Center Clinic: Patients are seen on consults from primary care or surgery clinics. Fellow is responsible for assessment and treatment of patients assigned to the clinic. Once therapy is initiated and patient is stabilized, patients are referred back to their primary care providers. Fellow is responsible for the supervision of residents and medical students if assigned to the clinic. All VA requirements regarding patient access to clinic as well documentation of faculty supervision must be complied with.

Attending Supervision:

There are 3 faculty members assigned to the clinic. Faculty member will be available for the fellows for consultation and discussion of treatment issues. Faculty input and concurrence with treatment plans is to be documented in the chart for all new patients and those established patients undergoing cardiac catheterization and revascularization procedures. Please also refer to the general supervision principles for the fellowship in this document.

Mix of diseases and patient characteristics:

A variety of patients with chronic cardiovascular conditions will be available, including

- Chronic coronary artery disease
- Congestive heart failure
- Arrhythmias
- Lipid disorders
- Hypertension
- Cardiomyopathy
- Valvular heart disease
- Pulmonary heart disease
- Infectious and inflammatory heart disease
- Adult congenital heart disease

Teaching Methods:

Discussion with attending

Evaluation:

Chart stimulated recall.

Written evaluation will be generated at six-monthly intervals.

The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

Procedures:

None

Suggested Reading:

Textbook of Cardiovascular Medicine, Editor: Eric J. Topol, *Lippincott-Raven*

Heart Disease: A Textbook of Cardiovascular Medicine, Editor: Eugene Braunwald, *W.B. Saunders Company*

Hurst's The Heart, Editors: Schlant, Alexander, *McGraw-Hill, Inc.*

II b. Description of the Rotations

I. Cardiac Rehabilitation

Educational Purpose and Associated Core Competencies:

Fellow will be expected to acquire the following skills during rotations in the Cardiac Rehabilitation Service:

1. Know the identification and assessment of patients with cardiovascular diseases who are candidates for cardiac rehabilitation.
(Core competencies: Medical knowledge, patient care, procedure skills)
2. Know the principles of inpatient and outpatient cardiac rehabilitation.
(Core competencies: Medical knowledge, patient care)
3. Know the risk stratification and control of risk factors patients with cardiovascular disease.
(Core competencies: Medical knowledge, patient care, practice-based learning)
4. Know how to develop an exercise prescription for patients with cardiovascular disease.
(Core competencies: Medical knowledge, patient care, system-based care, procedure skills)
5. Know the assessment of the progress of patients while enrolled in the cardiac rehabilitation program.
(Core competencies: Medical knowledge, patient care)

Fellow Responsibilities:

First Year Only:

1. Rounds in the cardiac rehabilitation unit at the VA Medical Center and OUMC along with the cardiac rehabilitation nurse
2. Assess progress of patients with the physician director
3. Formulate exercise prescriptions for the patients
4. Serves as a resource for problems that may arise with patients

Mix of Diseases and Patient Characteristics:

- Post-coronary intervention patients
- Post-myocardial infarction patient
- Patients with chronic forms of coronary artery disease

Teaching Methods:

Rounds
Reading assignments

Procedural skills:

Stress testing
Exercise prescription writing

Suggested Reading:

Advances in Cardiopulmonary Rehabilitation, editors Jean Jobin, Francois Maltais, Pierre LeBlanc, Clermont Simard. Published by Human Kinetics

Psychosocial Interventions for Cardiopulmonary Patients. Wayne M. Sotile. Published by Human Kinetics

Clinical Cardiac Rehabilitation: A Cardiologist's Guide. Editors Fredric J. Pashkow, William A. Defoe. Published by William & Wilkins

Guidelines for Cardiac Rehabilitation Programs by American Association of Cardiovascular and Pulmonary Rehabilitation. Published by Human Kinetics

Cardiac Rehabilitation. Published by US Department of Health and Human Services

Method of Evaluation:

End of rotation written evaluation by faculty. The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

II b. Description of the Rotations

J. Nuclear Cardiology

Educational Goals and Associated Competencies:

Nuclear cardiology rotation is aimed at providing the fellow an overview of the common diagnostic tests using nuclear isotopes. This included myocardial perfusion imaging, estimation of ventricular ejection fraction by nuclear ventriculography and infarct imaging.

Fellows will acquire the following skills:

1. Know the basics of physics of nuclear isotopes and principles of nuclear safety.
(Core competencies: Medical Knowledge, Systems-Based Care)
2. Identify patients who are appropriate candidates for nuclear cardiology studies.
(Core competencies: Medical Knowledge, Patient Care, Practice-Based Learning and Improvement)
3. Evaluate abnormalities seen on nuclear cardiac studies.
(Core competencies: Medical Knowledge, Patient Care)

Fellow Responsibilities:

1. Evaluate the appropriateness (AUC) of the stress test ordered and assess the ability of the patient to undergo the test referred for nuclear cardiac stress testing.
2. Supervise the nuclear stress testing including tests performed utilizing adenosine, dobutamine or exercise.
3. Interpret nuclear stress tests under direct supervision of an appropriately qualified attending physician.
4. Attend the lectures and conferences regarding Nuclear Cardiology offered during the rotation.

Mix of Disease and Patient Characteristics:

- Patients with chest pain from the clinic, in patient service or ER
- Post myocardial infarction of revascularization patient with ischemia
- Patients with unexplained systolic dysfunction

Teaching Methods:

Reading studies with nuclear medicine faculty
Directed reading
Yearly lecture series on nuclear physics

Procedure Skills:

Myocardial perfusion imaging
Nuclear ventriculography

Suggested Reading:

Essential Nuclear Medicine Physics by Powsner and Powsner
www.asnc.org Nuclear case studies (under education and online education links)

Method of Evaluation:

End of rotation written evaluation by faculty. The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

II b. Description of the Rotations

K. Heart Failure Rotation

Educational Goals and Associated Competencies:

- Know the pathophysiology, etiology and prevalence of heart failure
(*Core competencies: Medical Knowledge, Patient Care, System Based Practice*)
- Know the indication of implanted devices (ICD, pacing and resynchronization, mechanical assist devices) in heart failure
(*Core competencies: Medical Knowledge, Patient Care, System Based Practice, Professionalism*)
- Understand the role of drug therapy of acute decompensated and chronic heart failure
(*Core competencies: Medical Knowledge, Patient Care, System Based Practice*)
- Know the importance of end-of-life issues
(*Core competencies: Medical Knowledge, Patient Care, System Based Practice, Professionalism*)

Fellow Responsibilities:

First Year:

1. Attend Heart Failure Clinic at OU Physicians' Heart Lung Vascular (HLV) Clinics twice a week.

Fellow Assignment:

OU Medical Center
OU Physicians

Mix of Diseases and Patient Characteristics:

- Chronic heart failure
- Patients with ICD, CRT and CIEDs

Teaching Methods:

Clinic rounds
Reading assignments
Weekly case conference (Tuesday noon)

Procedural Skills to be Acquired and Documented:

CIED (Pacemaker & ICD) interrogation and follow up

Evaluation:

End of the rotation written evaluation by the attending. The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

II b. Description of the Rotations

L. EKG Reading (Heart Station & Dedicated EKG Reading Assignment)

Educational Goals and Associated Competencies:

1. Know the common abnormalities seen on 12 lead EKG (chamber enlargement, hypertrophy, acute myocardial infarction, atrial arrhythmias, ventricular arrhythmias, paced rhythms).
(*Core competencies: Medical Knowledge, Patient Care*)
2. Know the indications for ambulatory EKG monitoring (Holter monitoring).
(*Core competencies: Medical Knowledge, Patient Care*)
3. Know abnormalities seen on ambulatory EKG monitoring.
(*Core competencies: Medical Knowledge, Patient Care*)

Fellow Responsibilities:

First Year Fellow

- Over-read EKGs at VAMC
- Participate in Holter monitor reading with second or third year fellows
- Select EKGs from OUMC and VAMC for monthly EKG conference
- Attend VA EKG conference (Fridays at noon)

Second & Third Year Fellows

- Over-read EKGs at VAMC
- Review selected complicated EKGs with VA attending
- Read Holter monitors at VAMC
- Select EKGs from VAMC for monthly EKG conference
- Attend VA EKG conference (Fridays at noon)

Fellow Assignment:

OU Medical Center
VA Medical Center

Teaching Methods:

Sit down EKG reading session
Monthly EKG conferences
Directed reading

Procedural Skills to be Acquired and Documented:

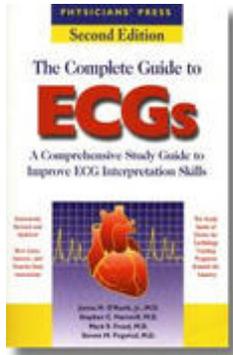
EKG reading
Ambulatory EKG reading

Evaluation:

End of rotation written evaluation by faculty. The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

Suggested Reading:

The Complete Guide to ECGs. Authors: James H. O'Keefe; Stephen Hammill



ISBN-13: 9781890114350

ISBN-10: 1890114359

Publisher: Physicians Press

Format: Paperback, 512 pages

II b. Description of the Rotations

M. Vascular Medicine

Educational Goals and Associated Competencies:

1. Know how to differentiate the clinical presentation and management of acute versus chronic peripheral vascular diseases including arterial, venous and lymphatic disorders.
(Core competencies: Medical Knowledge, Patient Care)
2. Know the use of various anticoagulants in the short and long-term management of patients with deep venous thrombosis, pulmonary embolism.
(Core competencies: Medical Knowledge, Patient Care)
3. Know basic principles of anatomical and physiological vascular testing for venous arterial disease.
(Core competencies: Medical Knowledge, Patient Care)

Description

The objectives of this rotation are to provide experience in the understanding, diagnosis, and treatment of peripheral arterial, venous, and lymphatic disorders. This is to be accomplished by participation in clinics, consultations, vascular laboratory activities, reading the core curriculum, and vascular conference.

Core Curriculum

Attached is a pdf to be read during this one-month rotation. Other reading materials are available.

Before the rotation

The fellows will receive an email with information regarding the rotation, and they are required to do a pre- test evaluation before starting the rotation.

Outpatient Care

Active participation in the VA Vascular Clinic and in the Vascular Clinic is expected. The VA Clinic convenes each Monday at 1:00 p.m. on 7E. The Fellow's Vascular Clinic convenes the first and second Wednesday of each month at 1:00 p.m. at PPB, sixth floor. Each patient's hospital and vascular lab studies are reviewed, and then each patient is interviewed, examined, and discussed with an attending physician to determine the appropriately formulated treatment plan. Occasionally, you may be asked to see patients in the faculty practice clinic at the OU Physicians / HLV clinic

Consult Service

Each medicine or cardiology fellow will be expected to see vascular medicine consults (all hospitals). Consult requests are made by paging the Vascular Medicine fellow (pager 559-6622), who will relay the request to the appropriate resident or fellow. They are responsible for initiating the patient contact for chart review, interview, examination, vascular laboratory and x-ray review, and presentation to the attending physician with a formulated diagnostic and treatment plan. As well, the resident or fellow is responsible for maintaining adequate follow-up, with further diagnostic and treatment suggestions during the remainder of the inpatient's stay, including appropriate discharge referrals to the respective vascular clinics, and presenting the data to the attending physician. The residents and fellows are expected to round with the attending every day, the time will be determined by the attending.

Vascular Laboratory Activity

The medicine resident or cardiology fellow is expected to develop an understanding of what each vascular lab study is used for and generally how it works. Observing actual studies is strongly encouraged.

The common studies performed in the vascular laboratories are:

- a. Lower extremity arterial physiologic study (LEA) with or without exercise
- b. Upper extremity arterial physiologic study (UEA)
- c. Venous duplex scan (ultrasound plus Doppler of lower and upper extremities)
- d. Venous reflux or valvular insufficiency
- e. Carotid duplex scan
- f. Temperature studies: vasospasm study in upper or lower extremities
- g. Visceral arterial studies
- h. Arterial duplex studies of the upper or lower extremities.

Weekly Vascular Conference

This conference convenes each Wednesday at 7:00 a.m. in the Basic Sciences Education Building, Room 272, and provides a forum to present a variety of specific vascular cases, with discussion among members of the General Surgery, Radiology Special Procedures, Interventional Cardiology, and Vascular Medicine staff. Appropriate vascular laboratory and x-ray reports are to be submitted for inclusion in the Vascular Conference case agenda. Occasionally, a 5-10 minute didactic presentation at the end of a Vascular Conference is expected. Possible topics are to be discussed with the appropriate staff.

Conferences:

Rotating fellows and residents are expected to attend our conferences and prepare an article for the journal club.

- Imaging conference: (First Friday, monthly)

Conclusion

For questions or concerns, contact Candice Edwards, extension 44745

Evaluation:

End of rotation written evaluation by faculty. The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

II b. Description of the Rotations

N. Pediatric Cardiology Rotation/Adult Congenital Heart Disease

Educational Goals and Associated Competencies:

1. Know the clinical presentation, physical findings, diagnostic testing and hemodynamics in patients with various types (simple and complex) of congenital heart disease.
(Core competencies: Medical Knowledge, Patient Care)
2. Gain knowledge about types of surgical procedures performed for the different types of congenital heart disease.
(Core competencies: Medical Knowledge, Patient Care)
3. Know the late sequelae of surgical procedures in patients with congenital heart disease
(core competencies: Medical Knowledge, Patient Care, System based Practice)

Fellow Responsibilities:

These will be determined by the pediatric cardiology/adult congenital heart disease faculty and could include attending the clinic, reading TTEs, scrubbing in the cath lab and self study of interesting case files.

Teaching Methods:

Didactic session, patient care rounds, reading diagnostic studies

Procedure Skills to be attained:

None

Evaluation:

End of rotation written evaluation by faculty. The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

II b. Description of the Rotations

O. Cardiothoracic Surgery Rotation

Educational Goals and Associated Competencies:

1. Know the indications, risk assessment and steps involved in coronary artery bypass grafting and valvular surgical procedures.
(Core competencies: Medical Knowledge, Patient Care)
2. Know the basics about cardiopulmonary bypass and cold cardioplegia and understand their pros and cons.
(Core competencies: Medical Knowledge, Patient Care)
3. Know the post-operative complications and follow up after cardiac surgery
(Core Competencies: Medical Knowledge, Patient Care, System based Practice)

Fellow Responsibilities:

These will be determined by the CT Surgery attending and may include patient clinic assignment, scrubbing in the OR and follow up of post-op patients

Teaching Methods:

Bedside teaching during ward rounds

Procedure Skills to be attained:

None

Evaluation:

End of rotation written evaluation by faculty. The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

Suggested Reading:

Braunwald's Text book in Cardiology

II b. Description of the Rotations

P. EP Ablation Rotation

Educational Goals and Associated Competencies:

1. Know the indications of ablation of various arrhythmias.
(*Core competencies: Medical Knowledge, Patient Care*)
2. Know the basics about various types of ablative procedures including radiofrequency and cryotherapy.
(*Core competencies: Medical Knowledge, Patient Care*)
3. Know the basics about the sites of ablation in various types of atrial and ventricular arrhythmias.
(*Core competencies: Medical Knowledge, Patient Care*)

Fellow Responsibilities:

1. Observe each of the following case types:
 - a. Supraventricular tachycardia (AVNRT, AVRT)
 - b. Atrial fibrillation
 - c. Ventricular tachycardia
2. Observe and assist with patient care pre and post procedures
3. Attend Wednesday afternoon arrhythmia and device clinics, 1pm
 - a. 1st, 2nd, 3rd Wednesdays are at the VA, 5th floor
 - b. 4th Wednesday is at PPOB, 6th floor

Procedure Skills to be attained:

1. Obtain venous and arterial access, if attending of the case allows.
2. Know how to interpret basic intracardiac EGMs for possible general board questions
 - a. Ventricular tachycardia
 - b. Complete heart block
 - c. Infra-Hisian block
3. Know the basics about EP lab pacing maneuvers used to differentiate tachycardia mechanisms
 - a. Entrainment methods
 - b. Para-Hisian testing
 - c. Pace mapping/ activation mapping

Evaluation Methods:

End of rotation written evaluation by faculty. The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

Suggested Reading:

1. Cardiac Electrophysiology: A visual guide for nurses, techs, and fellows. Purves P et al.

II b. Description of the Rotations

Q. EP Consult Rotation

Educational Goals and Associated Competencies:

1. Know how to differentiate features of various atrial and ventricular tachy and brady arrhythmias.
(*Core competencies: Medical Knowledge, Patient Care*)
2. Know the indications, contra-indications, and mechanism of actions of various anti-arrhythmic drugs.
(*Core competencies: Medical Knowledge, Patient Care*)
3. Know how to interrogate pacemakers and implantable cardioverter-defibrillators.
(*Core competencies: Medical Knowledge, Patient Care*)

Fellow Responsibilities:

1. See and present inpatient consults to arrhythmia or pacing attending.
2. Attend Wednesday afternoon arrhythmia and device clinics, 1pm
 - a. 1st, 2nd, 3rd Wednesdays are at the VA, 5th floor
 - b. 4th Wednesday are at PPOB, 6th floor

Teaching Methods:

1. Attending and Fellow review of patient care plan in the clinic.
2. Attending and Fellow review of patient care plan in the hospitals (for consults).
3. Didactic lectures, Wednesday 8am, 6th floor Children's Hospital, Heart Rhythm Institute, Webster Laboratory.

Procedure Skills to be attained:

1. CIED interrogation and troubleshooting.
2. Assist with cardioversions.

Evaluation:

End of rotation written evaluation by faculty. The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

Suggested Reading:

1. Cardiac Electrophysiology: A visual guide for nurses, techs, and fellows. Purves P et al.

II b. Description of the Rotations

R. Structural Rotation (Integrated Valvular Heart Disease and Cardiovascular Imaging)

Educational Goals and Associated Competencies:

1. Know how to differentiate features of valvular heart disease.
(*Core competencies: Medical Knowledge, Patient Care*)
2. Know the indications and treatment for valvular conditions.
(*Core competencies: Medical Knowledge, Patient Care*)
3. Know how to select various cardiovascular imaging modalities to treat patients with coronary, structural, and valvular heart disease.
(*Core competencies: Medical Knowledge, Patient Care*)

Fellow Responsibilities:

1. Attend heart valve clinic 1-2 times weekly.
2. Participate in imaging aspect of transcatheter aortic valve procedures.
3. Participate with cardiac anesthesiologist in performing intraoperative imaging studies.
4. Supervise and interpret cardiac CT and MR studies.
5. Attend and participate in TAVR conference and scheduled didactic imaging conferences.

Teaching Methods:

1. Attending and Fellow review of patient care plan in the clinic.
2. Attending and Fellow review of patient care plan during procedures.
3. Didactic lectures, multidisciplinary valve conference.

Procedure Skills to be attained:

1. Cardiac CT, MR interpretation.
2. Assist with TEE performance and interpretation.

Evaluation:

End of rotation written evaluation by faculty. The evaluation tool utilized by the faculty for this rotation will be distributed via e-mail prior to the beginning of each month.

Suggested Reading:

Heart Disease: A Textbook of Cardiovascular Medicine, Editor: Eugene Braunwald, *W.B. Saunders Company*

II c. General Learning Objectives:

The following is a list of learning objectives during cardiology fellowship training.

OBJECTIVE 1: TAKES A HISTORY

Description of objective:

Demonstrates knowledge necessary to obtain an orderly history on patients suspected of having cardiovascular diseases and recognizes the importance:

- Dyspnea (resting, exertional, nocturnal, positional)
- Chest pain (specifically what constitutes “typical angina”)
- Edema
- Palpitations/arrhythmia
- Exercise tolerance
- History of hypertension and treatment
- History of rheumatic fever
- History of congenital heart disease
- History of cardiac murmurs or valvular heart disease
- Cardiovascular risk factors including family history
- Presyncope and syncope
- Claudication

Process for attainment of the objective:

This learning objective will be attained through bedside teaching on the wards and in the clinics

Assessment of learning:

Bedside rounds

OBJECTIVE 2: PERFORMS A PHYSICAL EXAMINATION

Description of the objective:

Demonstrates knowledge necessary for performing an orderly, systematic and adequate physical examination of patients with cardiovascular problems:

A. Arterial system

- Reports and demonstrates the correct method of measuring arterial blood pressure
- Is familiar with difficulties in measuring arterial blood pressure accurately
Variation between extremities, positions and level of extremity:
 - The auscultatory gap
 - Proper cuff size
- Is familiar with normal and common findings found by inspection or palpation of the venous and arterial pulses, including the following:

- A, C, V waves; visual estimation of venous pressure; hepatjugular reflux
- Effect of inspiration on neck veins
- Pulsus alternans, bisferiens, paradoxus
- Pulse in aortic regurgitation and aortic stenosis

B. Examination of the Heart

- Discusses normal and common abnormal findings found by inspection and palpation of the anterior chest, including the following:
 - Right and left ventricular heaves
 - Thrills
- Understands the events of the cardiac cycle and the genesis of:
 - S1, S2, S3, S4, summation gallop, splitting of S2 (normal and paradoxical) and opening snap
 - Innocent murmurs, including flow murmurs, venous hum and mammary souffles
 - Murmurs of valvular stenosis and insufficiency
 - Maneuvers that alter murmurs, i.e. Valsalva, squatting, inspiration, expiration
 - Pericardial rubs
 - Mitral valve clicks
 - Artificial valve sounds (normal and abnormal)

This learning objective will be attained through bedside teaching on the wards.

Assessment of process adequacy:

Evaluation t each rotation

Min-CEX (proctored bedside examination)

OBJECTIVE 3: ORDERS OR PERFORMS DIAGNOSTIC STUDIES, INTERPRETS LABORATORY DATA IN A REASONABLE, EVIDENCE BASED & COST-EFFECTIVE MANNER

Description of the objective:

- A. Electrocardiography
1. General knowledge of the range of the range of normal variation in QRS, P, ST, T wave indices
 2. Understanding of ECG diagnosis of LVH, left atrial enlargement, infarction patterns both acute and chronic
 3. Basic understanding of the diagnostic utility of the ECG in the diagnosis of arrhythmias

Process for attaining this objective:

This training will be acquired through EKG reading during the CCU and consult rotation. Additional resource available for the resident is the daily EKG classes & the monthly EKG conference.

B. Chest X-Ray

1. General knowledge of normal chest X ray findings
2. Appreciation of abnormalities seen in:
 - CHF
 - Valvular disease
 - Hypertensive disease
 - Ischemic heart disease
 - Common congenital abnormalities seen in adulthood

This training will be done during ward rounds and consult rounds.

C. Non-invasive Testing

1. Basic appreciation of the indications for
 - Echocardiographic assessment (transthoracic & transesophageal) including 2D and Doppler echocardiography
 - Ambulatory ECG (Holter) monitoring
 - Exercise testing with and without perfusion scintigraphy; understanding of sensitivity and specificity of test in the diagnosis of coronary artery disease
 - Tomographic imaging techniques including MRI and CT
2. Basic concepts will be covered in ward rounds and consult rounds. Further training will be available during in the Echo Labs and stress labs.

D. Invasive testing

1. Basic knowledge of the methodology involved in performing coronary angiography, left ventricular hemodynamic assessment and electrophysiological testing.
2. Understanding the indications and risks of invasive diagnostic procedures.
3. Occur during ward rounds and attending rounds.
4. Additional exposure is available for interested residents during the consult months.

OBJECTIVE 4: UNDERSTANDS THE PATHOPHYSIOLOGY, NATURAL HISTORY, PRESENTATION, DIAGNOSTIC WORK UP AND MANAGEMENT OF

A. Congestive Heart Failure

1. Altered myocardial hemodynamics as well as abnormal neuroendocrine responses
2. Precipitating causes of worsened CHF
3. Mechanisms and importance of diastolic dysfunction
4. Therapy including relative value/limits of diuretics, digoxin, vasodilators or fluid restriction, inotropic agent therapy

B. Coronary Artery Disease

1. Risk factors for coronary artery disease and their modification
2. Differential diagnosis of chest pain
3. Chronic and acute ischemic syndromes (unstable angina and acute MI) with emphasis on proper history taking

4. Noninvasive and invasive testing in patients with suspected coronary artery disease
5. Complications in acute post myocardial infarction syndromes such as arrhythmias, sudden death, mechanical lesions, pericarditis and cardiac rupture
6. Indications for coronary arteriography
7. Role of interventional procedures and cardiac surgery in the treatment of coronary artery disease
8. Role of medical management (Thrombolytic drugs, ACE inhibitor drugs, beta blockers, lipid lowering agents)

C. Arrhythmias

1. Bradyarrhythmias including various forms of conduction disturbances and AV block, with emphasis on the indications for pacing
2. Tachyarrhythmias including an emphasis on the EKG diagnosis of wide complex
 - Atrial:
 - Atrial tachycardia/AV nodal reentrant tachycardia
 - Atrial fibrillation
 - Atrial flutter
 - Ventricular:
 - Premature ventricular contractions (PVCs)
 - Ventricular tachycardia
 - Torsade de pointes
 - Ventricular fibrillation
 - Pre-excitation syndromes
 - Understanding the importance of catheter ablation techniques in treatment of arrhythmias

D. Cardiomyopathy

1. Differential diagnosis and laboratory assessment
2. Treatment including cardiac transplantation
3. Follow up of the post transplant patient

E. Valvular heart disease

1. Acute rheumatic fever including diagnostic criteria
2. Aortic stenosis/regurgitation
3. Mitral stenosis/regurgitation
4. Tricuspid stenosis/regurgitation
5. Pulmonary stenosis/regurgitation
6. Mitral valve prolapse

F. Pericarditis

1. Acute: etiology, symptoms and diagnosis
2. Chronic: including large pericardial effusion, cardiac tamponade and the indications for pericardiocentesis
3. Diagnosis and management of constrictive pericarditis

G. Cardiac tumors

1. Cardiac involvement in metastatic cancer
2. Myxoma

H. Congenital heart disease

1. Diagnosis, history and physical of the adult with congenital heart disease especially for the diagnosis of:
 - Atrial septal defect
 - Ventricular septal defect
 - Aortic stenosis
 - Pulmonic stenosis
 - Coarctation of aorta
 2. Basic understanding of the adult with partially corrected congenital heart disease and post-op complications of the more common repair procedures, e.g.
 - Transposition of the great vessels
 - Tetralogy of Fallot
 - Ebstein anomaly
- I. Pulmonary heart disease
1. Cor pulmonale
 2. Pulmonary embolism
 3. Primary pulmonary hypertension
- J. Cardiac involvement in systemic disease
1. Diabetes mellitus
 2. Thyroid disease
 3. Obesity
 4. Thiamine deficiency
 5. Pheochromocytoma
 6. Rheumatic diseases including scleroderma, SLE, temporal arteritis, polyarteritis nodosa and rheumatoid arthritis
 7. Pulmonary embolism and deep venous thrombosis
 8. Arterial embolism
- K. Peripheral vascular disease
1. Arteriosclerosis obliterans
 2. Aneurysms
 - Abdominal aortic
 - Thoracic aortic (including aortic dissection)
 - Peripheral vascular
- L. Miscellaneous Cardiac Conditions
1. Trauma to heart and great vessels
 2. Infectious diseases
 - Viral myocarditis
 - Infectious myocarditis
 3. Assessment of pre-operative risk for non-cardiac surgery

This training will be accomplished during ward rounds, consult rounds and by didactic lectures.

OBJECTIVE 5: DEVELOPS TREATMENT PLAN FOR COMMON CARDIAC PROBLEMS

- A. For each major disease of cardiovascular system, identifies the appropriate therapeutic approach, knows the indications for and can perform the following:

- Cardiopulmonary resuscitation
- Emergency cardioversion
- Carotid massage
- Central venous pressure catheter insertion

B. This training will be provided during CPR certification, ward responsibilities in the coronary care unit and ward rounds.

1. For each of the treatment and drug types listed below, identifies indications, dose, action mechanism, main effects, adverse reactions, interactions, cost, efficacy and appropriate follow up:

- Digitalis and other inotropic drugs
- Antiarrhythmic drugs
- Diuretics
- Calcium channel blockers
- Beta blockers
- Angiotensin-converting enzyme inhibitors
- Vasodilators
- Anticoagulants and thrombolytics
- Antihypertensive agents
- Lipid lowering agents
- Rheumatic fever prophylaxis
- Endocarditis prophylaxis
- Nitrates

C. Instruction will be provided during ward rounds, clinics and through didactic lecture sessions.

1. Informed, aware and able to participate in and teach to patients, students, medical personnel and colleagues regarding:

- Preventive cardiology
- Psychological aspects of cardiac disease
- Behavioral therapy including stress management, risk factor reduction
- Proper nutrition especially regarding lipid management and obesity
- Medical cost/benefit including different national systems and medical care rationing
- Clinical trials, Meta analysis

This training will be obtained during ward rounds and clinic rotations.

III. RESOURCES AVAILABLE

III a. Training Sites

The spectrum of cardiac pathology available at the two teaching sites – OUMC and VA Medical Center are adequate resources to attain the educational objectives for the cardiology fellows. Moreover, additional teaching material is provided during vascular medicine and heart failure rotations. Ward rounds are conducted daily in the CICU, PCCU and consult teams. Stress laboratory, echocardiographic laboratory and cardiac catheterization laboratory operate daily at all the two teaching sites.

For acquisition of physician diagnosis skills, a patient simulator (HARVEY) is available on campus. Access to HARVEY can be obtained through the college of medicine offices.

III b. Teaching Conferences

The general objective of teaching conferences is to help the cardiology fellow develop concepts in cardiac anatomy, physiology, pathophysiology, pharmacology, cardiac catheterization, echocardiography, electrophysiology and preventive cardiology. Lectures help in augmenting knowledge gained in the cath lab, echo lab, ward rounds and clinics, while providing opportunities to discuss topics not routinely discussed during ward rounds or lab activities.

Cardiac Cath/Cardiac Surgery Conference

Every Tuesday

Time: 7:15-8:00 am

Location: Cardiology Conference Room (AAT 5400)

Cath Morbidity & Mortality Conference

Second Monday, Every month

Time: 7:15-8:00 am

Location: Cardiology Conference Room (AAT 5400)

Wednesday Morning Conference:

Time: 7:30-8:30 am

Location: Cardiology Conference Room (AAT 5400)

First Wednesday: Program Director's Meeting

Second Wednesday: CCU case conference (Presenters: OU CICU Fellows from prior 2 months, 20 min. presentations, 1 case each), or Research Conference (2 research fellows, 20 min. maximum per presentation)

Third Wednesday (every other month): Journal Club (as assigned and previously notified) or the Faculty Wheelhouse*

Fourth Wednesday: EKG conference**

Fifth Wednesday: No conference

* Wheelhouse lectures will consist of didactic, evidence-based lectures provided by faculty to fellows on topics of clinical or research interest (items that faculty are very passionate about). The format will vary and be driven by faculty preference.

** EKG reading skills are essential for the cardiology boards; passing the boards requires passing the EKG component of the examination. Fellow assigned to EKG conference must select

EKGs in advance. The coding sheet from the EKG text book by O'Keefe should be used for the session in order to acquire expertise in its use for the Board examinations. Fellow will also be assigned a specific EKG topic for a 10-15 minute in-depth review monthly.

Echocardiography Conference

Every Friday

Time: 7:15-8:00 am

Location: Cardiology Conference Room (AAT 5400)

In addition to review of interesting cases, test sessions for practice using the board exam template will be held.

Cardiology Grand Rounds

Every Thursday

Time: 7:15-8:00 am

Location: via Zoom

Each fellow will present Cardiology Grand Rounds once annually. Fellows should discuss a patient with a complex therapeutic decision issue. Fellows are responsible for coordinating month/date directly with Dr. Sivaram.

Vascular Medicine Conference

One Friday a Month

Time: 12:00-1:00 pm

Second Friday: Vascular Imaging Conference (location will vary – watch for e-mails)

Signing in is required for each conference. A minimum of 75% attendance is required. Fellows must adjust their schedules to attend each teaching session since the goals of these sessions are to educate the fellows, prepare them for taking the boards and groom them for practice cardiology effectively. Please remember that punctuality is a very important professional quality.

IV. RELATIONSHIP OF CORE COMPETENCIES AND EDUCATIONAL OBJECTIVES TO TEACHING CONFERENCES

Educational objectives covered by conferences:

Wednesday Faculty Wheelhouse Conference for the fellows:

- Pathophysiology of heart disease, pharmacology, anatomy, embryology
(Core competencies: Medical Knowledge, Practice based learning and improvement, system-based practice, procedure skills)

Cath & Cardiac Surgery Conference:

- Invasive testing indications and role of percutaneous coronary interventions and cardiac surgery
(Core competencies: Procedure skills, medical knowledge, practice based learning and improvement, system based practice, professionalism)

Vascular Conference:

- Symptoms and signs of peripheral vascular disease, diagnostic tests and interventional and surgical treatment of vascular disease
(Core competencies: Medical knowledge, procedure skills, practice-based learning and improvement)

Echocardiography Conference:

- Indications and role of echocardiography in various cardiac diseases
(Core competencies: Medical Knowledge, procedure skills)

CICU Patient Care Conference:

- Acute coronary care, pharmacology, evidence based cardiac care, quality improvement
(Core competencies: Medical Knowledge, patient care, practice based learning and improvement, system based practice, professionalism)

Journal Club:

- New developments in cardiology
- Evidenced based medicine
- Critical review of the literature
(Core competencies: Medical knowledge, practice-based learning and improvement)

Fellow's Research Conference:

- Research methodology
- Opportunities for residents to participate in research
(Core Competencies: Medical Knowledge, practice-based learning and improvement)

V. TEACHING PLAN FOR SPECIFIC LEARNING OBJECTIVES

Cardiovascular Illness

Competency	Priority	Preferred Learning Venues		
		Outpatient Cardiology Clinic	Inpatient Wards	Didactic
Atrial Arrhythmias	1	Yes	Yes	Yes
Conduction Abnormalities	1	Yes	Yes	Yes
Ventricular Arrhythmias	1	Yes	Yes	Yes
Pacemaker Management	3	Yes (Pacemaker Clinic – elective)		
Congenital Heart Disease	3	Yes (Adult Congenital Heart Clinic – elective)		
Congestive Heart Failure				
Acute Pulmonary Edema	1		Yes	Yes
Chronic CHF	1	Yes	Yes	Yes
Coronary Artery Disease				
Stable Angina	1	Yes	Yes	Yes
Unstable Angina	1		Yes	Yes
Myocardial Infarction (uncomplicated)	1		Yes	Yes
Myocardial Infarction (complicated)	1		Yes	Yes
Myocardial Infarction (follow-up)	1	Yes	Yes	Yes
Post Procedure Care	1	Yes	Yes	Yes
Endocarditis	1	Yes	Yes	Yes
Hypertension				
Chronic	1	Yes	Yes	Yes
Acute	1		Yes	Yes
Sec. Hypertension	1	Yes		Yes
Myocardial Disease				
Cardiomyopathy	3			Yes
Myocarditis	3			Yes
Pericardial Disease				
Acute Pericarditis	1	Yes	Yes	Yes
Pericardial Tamponade	2		Yes	Yes
Pre-op Evaluation	1	Yes	Yes	Yes
Valvular Disease	1	Yes	Yes	Yes
Vascular Disease				
Aortic Disease	1	Yes	Yes	Yes
Arterial Insufficiency	1	Yes	Yes	Yes
Chronic Venous Stasis	1	Yes	Yes	Yes
Deep Venous Thrombosis	1	Yes	Yes	Yes
Aneurysm	3			Yes
Aortic Dissection	3		Yes	Yes
Drug Therapy of Cardiac Disease	1	Yes	Yes	Yes
1 = Direct patient responsibility preferred				
2 = Any other form of learning that is centered on a patient				
3 = Lectures/seminars/reading suffice				

VI. PROCEDURE SKILLS

VI a. List of Procedures

1. Advanced cardiac life support – mandatory
2. Training acquired through ACLS training at the beginning of residency
3. Elective cardioversion
4. Training acquired through formal lectures, during the CCU rotation, EP consult rotation
5. Programming and follow-up surveillance of permanent pacemakers
6. Training acquired through pacing rotation, formal didactic courses offered by Medtronic and during the CCU rotation
7. Insertion of Swan-Ganz (pulmonary artery flotation) catheter
8. Training acquired during CICU rotation and the cath lab rotation
9. Insertion of temporary pacemaker
10. Training acquired during CICU rotation and the cath lab rotation
11. Stress testing
12. Training acquired during echo lab rotation and Heart Station rotations at OUMC and VA Medical Center
13. Tilt Table
14. Training available during Heart Station Rotation
15. Right and left heart catheterization including coronary arteriography
16. Training acquired during cath lab rotation
17. Echocardiography, including transthoracic echocardiography (performance & interpretation), stress echo, transesophageal cardiac studies

VI b. Documentation of Procedures

Objectives:

- To track all cath lab, echo lab, nuclear lab and EP lab procedures to be assess volume of procedures that fellow participated in and procedural competency.
- To track complications from procedures
- To develop log books which will help in certifying competencies of fellows

Expectations:

Fellow will record procedures through Med-Hub the following procedures:

- Left and right heart catheterization
- Myocardial biopsy
- Pericardiocentesis
- Intra-aortic balloon counterpulsation
- Transthoracic Echocardiogram
- Stress echocardiogram
- Transesophageal echocardiogram
- Nuclear stress imaging
- Temporary pacing
- Right heart catheterization (bedside)
- Perclose and other closure devices
- Peripheral arteriograms
- EP study
- Permanent pacemaker implantation
- Follow-up and programming of permanent pacemakers and other devices (ICD)

Logs will need the following information for each procedure:

- Name and ID of patient (HIIPA compliant)
- Indication for the procedure
- Nature of procedure
- Attending supervising the procedure
- Fellow involvement (first assistant, second assistant etc) in the procedure
- Complications of the procedure
- Attending signature

Logs need to be completed on MedHub after each rotation for tracking with the signatures of the supervising attending confirming verification. There is no need to document EKGs & ambulatory EKGs. COCATS guidelines will be used to judge levels of competency in each procedure (Levels I, II and III).

VII. READING LIST RECOMMENDATIONS

Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine, by Eugene Braunwald (Editor), Douglas P. Zipes (Editor), Libby Peter (Editor), Robert Bonow (Editor)

Heart, Arteries and Veins by Hurst, J. Willis/ Editor(s): Schlant, Robert C.

Mayo Cardiology Board Review

Cardiosource for Institutions teaching material (includes ACCF Board Review, several SAPs)

The Mayo Echo Manual by Jae K. Oh

Essential Nuclear Medicine Physics by Powsner and Powsner 2nd edition

www.asnc.org Nuclear case studies (under education and online education links)

VIII. OUTLINE FOR INCORPORATING CORE COMPETENCIES INTO ROTATIONS

<i>Competency</i>	<i>Location for Training & Evaluation</i>	<i>Methodology for Testing</i>
1. Patient Care	CCU Consult Service	Global rating In-training Exam ABIM exam 360° Evaluation
2. Medical Knowledge	CCU Consult Service Research Rotation	Global rating In-training Exam ABIM exam
3. Practice-based Learning & Improvement	CCU Consult Service Research Rotation	Global Rating 360° Evaluation
4. Interpersonal & Communication Skills	CCU Consult Service	Global Rating 360° Evaluation
5. Professionalism	CCU Consult Service	Global Rating 360° Evaluation
6. System-based Practice	CCU Consult Service	Global Rating 360 ° Evaluation

IX. COCATS-4 COMPETENCY TABLES

See attached and also refer to the full COCATS-4 document in MedHub (under “Documents and Resources”) for specific procedural requirements.