

Cardiovascular Medicine Elective
Inova Fairfax Medical Campus
Internal Medicine Residency Program

Course Director: Dr. Kevin Rogan (outpatient) and Dr. Robert Cunnion (inpatient)

1. Educational Purpose and Goals

- a. Expose residents to common cardiovascular problems seen in outpatient and inpatient settings; provide training and education in the specific aspects of cardiology that will be most relevant to the primary care practitioner.
- b. Learn how to take a detailed history pertaining to complaints related to cardiovascular disease.
- c. Perform and interpret a detailed physical exam in a patient with a suspected cardiovascular problem.
- d. Develop a rational diagnostic and therapeutic approach to problems in cardiovascular medicine.
- e. For PGY1 level residents, the focus of this elective will be primarily outpatient evaluation, and management in the ambulatory setting as well as exposure to common cardiac diagnostic procedures. For PGY2/3 level residents, the elective will include both outpatient and inpatient experiences will be included as well as opportunities in invasive cardiology and advanced heart failure, heart transplant programs.

2. Principal Teaching/Learning Methods

- a. *Supervised patient care:* PGY-1 elective in cardiovascular medicine will be all outpatient/ambulatory based rotation through the offices of Inova Cardiology Group. PGY2/3 level elective will include a combination of both inpatient and outpatient experiences in cardiovascular medicine. An individualized rotation in cardiovascular medicine can be arranged for PGY2 and 3 level residents that are interested in Heart Failure and Transplant in addition to general cardiovascular elective. Residents will perform initial cardiology consultations when requested by the attending faculty. The resident will formulate a hypothesis and a treatment plan and present it to the attending faculty. Both the resident and attending faculty will examine the patient and discuss the plan of care. Residents will continue to follow patients after the initial consultation. When time is spent in the outpatient clinic, a faculty cardiologist member will supervise the resident, and residents will evaluate in the same fashion as above.
- b. *Didactics/Small group sessions*
 - i. Noon conference and grand rounds covering cardiology topics as applicable.
 - ii. Faculty will provide instruction on core cardiology topics which will also include EKG readings, echo and stress testing modalities in addition to clinic- or ward-based didactics..
- c. *Brief (30 minutes) lecture* on a cardiovascular medicine topic – to cardiology team presented by the resident.

- d. *Independent reading* – all residents are expected to read about patients they see in the hospital and office (suggested resources below). The following Hopkins modules (PEAC) should be completed during this rotation if not already completed:
 - i. Lipid Management
 - ii. Pre-op evaluations.

3. Educational Content

- a. Patient/Disease mix – In both ambulatory and inpatient settings at Inova Fairfax Hospital, adult patients provide an ethnically diverse patient population with a broad array of common and rare diseases. Residents will see patients with acute coronary syndromes, coronary artery disease, valvular heart disease, hypertension, cardiomyopathy/congestive heart failure, arrhythmias, peripheral arterial disease, pericardial disease, cor pulmonale and pulmonary hypertension, congenital heart disease, and syncope. Also, residents will learn indications for devices (pacemakers, ICD's) and diagnostic tests/procedures (noninvasive testing for coronary artery disease, cardiac catheterization, tilt table testing, EP studies). Residents will perform peri-operative consults, focusing on cardiac risk assessment for non-cardiac surgery. Also, patients awaiting heart transplantation or status post transplant for heart failure will be seen. Finally, residents will have the opportunity to participate in (when appropriate) and observe cardiac catheterizations, EP studies, device implantations, treadmill tests, nuclear/echo/CT noninvasive tests, and tilt table tests. In the outpatient setting, the focus will be the ambulatory care of patients with some of the above disorders. EKG interpretation will be emphasized on all patients.
- b. Learning venues
 - i. Inova Fairfax Hospital (for PGY2/PGY 3 residents)
 - ii. Inova Medical Group Cardiology Clinics
 - iii. Inova cardiac catheterization lab
 - iv. Inova cardiac diagnostics lab
 - v. Inova Heart Failure Transplant Clinic (for select PGY3 residents)
- c. Structure – The rotation is a four-week long block. Residents will not be on call for this service, although they may be on disaster call for the program during this elective. There are no weekend duties. Residents will continue to attend their continuity clinic during this rotation. The course director or designee will orient the resident to the rotation at the beginning of the block and will review the specific schedule at that time. As mentioned before, PGY-1 residents will always be in an ambulatory setting. PGY2/3 residents will spend 1-2 half days/week in the clinic. There will always be at least 4.5 hours of teaching attending rounds or direct teaching and supervision by a cardiologist faculty member per week, and usually these will be integrated with work rounds. Residents will never work more than 14 hours in a day and typically will work for approximately 10 hours per day, five days per week.

4. Principal Educational Materials

- a. At the beginning of the rotation, the educational director will provide materials, including this curriculum, and a resource list.

5. Methods of Evaluation

- a. Feedback will be given throughout the rotation as appropriate. At the end of the rotation, a designated faculty cardiologist will complete an E-value web-based evaluation and review it with the resident.
- b. The residents will also evaluate faculty and the rotation in an anonymous fashion (summarized quarterly in a composite form).
- c. Pre-test and post-test to assist in curriculum and structure adjustment (in-training exam results will also be utilized for this purpose).
- d. A nurse or manager from the hospital or clinic will be chosen to evaluate the resident (360 or multi-rater component) where applicable.
- e. Lectures will be evaluated by the supervising faculty immediately after the session, and an evaluation will be placed in the resident portfolio.
- f. PGY-1 level residents must perform at least one mini-CEX during this rotation. PGY2/3 level residents are also encouraged to perform one mini-CEX with their supervising faculty physician.

6. Resource List

- a. Harrison's Principles of Internal Medicine, Cardinal Manifestations of Disease, Chapter 13 – "Chest Discomfort and Palpitations." and Chapters 32 – 39 (Alterations in Circulatory and Respiratory Functions). Part Eight – "Disorders of the Cardiovascular System."
- b. ACC website for guidelines – including peri-operative cardiac risk assessment for non-cardiac surgery.
- c. Marriott's Practical Electrocardiography, 2001
- d. Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine, 2005
- e. Annals of Internal Medicine – Update in Cardiology
- f. Hopkins modules – ilc.peaonline.org

Learning Venues

1. Supervised patient care/Attending rounds/Attending review of cases in clinic/Mini-CEX
2. Small group and Didactic sessions
3. Lecture given by the resident
4. Independent reading
5. Hopkins modules

Methods of Evaluation

- A. Attending evaluation
- B. Nurse of ancillary staff evaluation
- C. Direct observation with feedback
- D. Hopkins modules
- E. ITE exam scores for self- assessment

Competency: Patient Care	Learning Venues	Evaluation methods
Work with the attending cardiologist and provide effective consultations to services that request them.	1	AC
Improve auscultation and physical examination skills. Correlate the examination of patients during consultation with the results from the echocardiography and catheterization lab.	1,2,4,5	ACE
Effectively evaluate and manage patients with acute cardiac illness.	1,2,4,5	ACE
Effectively manage patients with undiagnosed chest pain, including the appropriate use of diagnostic testing	1,2,4,5	ACE
Competency: Medical Knowledge	Learning Venues	Evaluation Methods
Articulate the pathophysiology, evaluation and management of acute coronary syndromes, coronary artery disease, valvular heart disease, hypertension, cardiomyopathy/congestive heart failure, arrhythmias, peripheral arterial disease, pericardial disease, cor pulmonale and pulmonary hypertension, congenital heart disease, and syncope	1-5	ACDE
Competency: Interpersonal and Communication Skills	Learning Venues	Evaluation Methods
Interact in an effective way with physicians and nurses participating in the care of patients requiring cardiology consultation and care	1	ABC
Be able to explain rationale of therapy (medicines and lifestyle alterations) to	1,2,4,5	ACE

patients to promote adherence, especially for diseases without symptoms (hypertension, stable congestive heart failure)		
Show understanding of differing patient preferences in diagnostic evaluation and management of cardiovascular disorders	1	AC
Competency: Professionalism	Learning Venues	Evaluation Methods
Treat team members, primary care givers, and patients with respect	1	ABC
Actively engage in the academic process	1-5	ACDE
Attend and participate in all scheduled conferences	2,3	ACD
Competency: Practice Based Learning	Learning Venues	Evaluation Methods
Identify limitations of medical knowledge in evaluation and management of patients with cardiovascular disorders and use the medical literature, colleagues, ancillary staff, fellows, and attendings to address these gaps	1-5	ACDE
Competency: Systems-Based Practice	Learning Venues	Evaluation Methods
Understand barriers to optimal care for patients with cardiovascular disease	1	AC
Understand the indications for and steps toward cardiac transplantation	1,2,4,5	ACE

Above are applicable to all levels of training.

As mentioned in the overall Internal Medicine program curriculum, residents will get progressive authority as they progress from PGY-1 year to PGY-3 year. The following additional progressive management goals are applicable to Cardio-vascular elective rotation.

Progressive management goals for Cardiovascular Medicine rotation:

PGY1

Interns should be expert in the collection, organization, and presentation of the data necessary for the daily management of patients. They should reliably enact the management plans of the patients for whom they are responsible. They should demonstrate initial competency in the physical examination of the cardiovascular system, in the reading of electrocardiograms and chest radiographs, and in the interpretation of laboratory values including cardiac biomarkers, BNP levels, lipid profiles, and right heart catheterization data. They should have a solid understanding of the diagnosis and management of common cardiovascular conditions such as; chronic and acute myocardial ischemia, valvular heart disease, chronic and acute decompensated heart failure, atrial fibrillation, and malignant ventricular arrhythmias. They should have an initial level of competency in selecting methods for stress testing.

PGY2

Second Year Residents should be proficient in the aforementioned responsibilities. They should be expert in directing a team providing Advanced Cardiac Life Support. They should demonstrate the ability to independently perform a reliable and accurate physical examination of the cardiovascular system, and begin to correlate exam findings with echo and cardiac catheterization data. They should be able to independently interpret more common findings on electrocardiograms, chest radiographs, and laboratory studies including cardiac biomarkers, BNP levels, lipid profiles, and right heart cath data and demonstrate initial competency in interpreting less common findings. They should be able to independently diagnose and manage common cardiovascular conditions including chronic and acute myocardial ischemia, valvular heart disease, acute decompensated heart failure, atrial fibrillation, and malignant ventricular arrhythmias and have a solid understanding of less commonly encountered cardiovascular diseases. They should be able to independently select appropriate methods for stress testing. They should demonstrate initial competency in reading echocardiograms, right heart pressure tracings, and coronary angiograms.

PGY3

Senior Residents should be proficient in the aforementioned responsibilities. They should be experts in the physical examination of the cardiovascular system, and be able to correlate exam findings with echo and cath data. They should be experts in the interpretation of more common finding on electrocardiograms, chest radiographs, and laboratory studies such as cardiac biomarkers, BNP levels, lipid profiles, and right heart catheterization data, and they should be able to independently interpret many less common findings. They should be experts in the diagnosis and management of common cardiovascular conditions including chronic and acute myocardial ischemia, valvular heart disease, acute decompensated heart failure, atrial fibrillation, and malignant ventricular arrhythmias. They should additionally be able to independently diagnose and manage many less commonly encountered cardiovascular diseases. They should be experts in the selection of appropriate methods for stress testing. They should demonstrate a basic level of competency in reading echocardiograms including the assessment of LV/RV function, severe valvular disease, tamponade, right heart pressure tracings, and coronary angiograms. They should have an initial level of competency in performing stress testing and reading nuclear perfusion images.

Topics for independent reading:

1. Lipid evaluation and treatment
2. Congestive heart failure evaluation and treatment
3. Evaluation of palpitations
4. Atrial fibrillation
5. Syncope
6. Valvular heart disease
7. Acute coronary syndrome
8. EKG interpretation
9. Stress testing
10. Echocardiography in adults
11. Nuclear cardiology
12. Cardiac catheterizations
13. Preoperative evaluation
14. Long term cardiovascular follow up
15. Pulmonary hypertension
16. Heart transplant