

Cardiology Consult Curriculum

I. Educational Purpose.

The management of patients with cardiac disease is an essential part of training in Internal Medicine. The Cardiology consult rotation bridges both the VA and University Hospital and intended to provide our residents a broad experience in managing all acute and chronic cardiac problems requiring consultation. This will allow residents to refine history and physical exam skills, to develop experience in the selection of diagnostic tests, and to learn the management of a wide variety of disease. It also affords the opportunity to work with interventional cardiologists and electro-physiologists as well as non-invasive cardiologists. Given the specificity of this rotation, residents need to be able to recognize, diagnose and begin the initial management of the basic disorders of the cardiovascular system. They will also need to appreciate the relative physiology and to be cognizant of the issues of preventive medicine as they relate to Cardiology.

The Cardiology Faculty include:

Locum Faculty	
Robert Carhart Jr., MD	Clinical Associate Professor of Medicine; Fellowship Director
Larry Charlamb, MD	Assistant Professor of Medicine, Interim Division Chief
Mark Charlamb, MD	Assistant Professor of Medicine
Debanik Chaudhuri, MD	Assistant Professor of Medicine
Hani Kozman, MD	Assistant Professor of Medicine
Christopher Nardone	Assistant Professor of Medicine
Charles Perla, MD	Assistant Professor of Medicine
Theresa Waters, DO	Assistant Professor of Medicine
Daniel Villarreal, MD	Professor of Medicine
Srikanth Yandrapalli, MD	Assistant Professor of Medicine

II. Learning Venue

- A. Rotation Description. Cardiology consult rotation generally involves a large team of learners; including the following: one attending, one fellow, one or more senior residents, one or more interns, and often one or more fourth year students. In general, the team will consult for and manage in hospital patients until their services are no longer needed. Ideally, most patients will be initially evaluated by either the intern or resident who then presents to the fellow or attending; however, throughout all phases of care the attending will be actively involved in decision making and teaching.

Residents at all level of training will perform the same duties; however, the PGY2 and 3 level residents will be expected to teach, follow more patients, and show leadership in practice based learning. The senior resident should also show mastery of the core topics by presenting these topics to the consult group. All residents will be expected to do additional reading specific to the caseload they are following.

B. Teaching Methods.

Every day, rounds will begin at approximately 8:30 with the fellow. The attending of the consult service will round on the consult patients. If time allows, CCU Rounds are optional. There will be a variety of conferences that the consult team will be attending including:

Invasive Cardiology Conference

Echocardiography Conference

Imaging Conference Journal Club

EKG Conference

Cardiology Fellow Conference

The primary learning process during this rotation comes from direct patient care. This involves being involved at the initial evaluation until the consult service "signs-off." It is an opportunity for residents to improve their skill at doing histories and physicals and develop management plans for the cardiac aspects of their patients.

Expected Reading. Any general internal medicine text can be used as an initial reading source. The entire array of available electronic and online medical textbooks (such as Harrison's, M.D. Consult, Up-To-Date, etc.) are commonly used references and are available to all computers with internet access. The main Cardiology textbook that should be read is Braunwald, Heart Disease, which is available in the medicine library.

C. Mix of Diseases.

1. Arrhythmias
 1. Atrial (flutter, fibrillation, etc)
 2. Conduction abnormalities
 3. Pacemaker management
 4. Ventricular
2. Congenital Heart Disease
3. Congestive Heart Failure
 1. Acute pulmonary edema
 2. Chronic congestive heart failure
 3. Diastolic
 4. Systolic
4. Coronary Artery Disease
 1. Angina pectoris, chronic stable
 2. Angina Pectoris, unstable
 3. Myocardial infarction, complicated
 4. Myocardial infarction, uncomplicated
 5. Myocardial infarction follow up
 6. Postoperative care (CABG, PTCA and stents)
5. Endocarditis
6. Hypertension
 1. Chronic stable hypertension
 2. Hypertensive crisis
 3. Secondary Hypertension
7. Myocardial disease
 1. Cardiomyopathy
 2. Myocarditis
8. Pericardial Disease
 1. Acute pericarditis
 2. Pericardial Tamponade
9. Preoperative evaluation of the cardiac patient
10. Vascular Disease
 1. Aneurysm (atherosclerotic, mycotic)
 2. Aortic Disease
 3. Arterial insufficiency
 4. Chronic venous stasis

5. Deep Venous Thrombosis
6. Aortic Dissection
7. Valvular heart disease
11. Patients with chest pain of unknown etiology
12. Pulmonary hypertension
13. Obesity, Diabetes, dyslipidemias, hypertension
14. Skills
 1. Diagnosis and management of angina, unstable angina and acute MI (Acute Coronary Syndromes)
 2. Diagnosis and management of acute and chronic CHF
 3. Diagnosis and management of acute and chronic atrial fibrillation/flutter
 4. Diagnosis and management of life threatening ventricular and atrial arrhythmias as outlined in the ACLS protocol
 5. Diagnosis and management of patients with chest pain of unknown etiology
 6. Evaluation of markers of myocardial injury
 7. Indications for angioplasty, stenting, CABG and medical therapy in patients with CAD
 8. Recognition of infarct patterns on a surface 12 lead EKG
 9. Interpretation of PA catheter waveforms
 10. Post-MI evaluation, risk stratification and management
 11. Indications for noninvasive and invasive cardiac evaluation
 12. Complications of cardiac catheterization and PTCA

III. Educational Contents - Recommended reading includes:

CAD, MI, Unstable Angina and Chest Pain

ACC/AHA/SCAI Guidelines for Coronary artery revascularization: A Report of the ACC/AHA Joint Committee on Clinical Practice Guidelines. JACC 2022; 79:e21-e129

ACC/AHA Guidelines for the management of STEMI. JACC 2016; 67:1235 and JACC 2013; 61: e78.

ACC/AHA Guidelines for the management of Non-STEMI. JACC 2016, 64, e139. JACC

2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients with Chronic Coronary Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines JACC 2023 Aug, 82(9)833-955

Application of Current Guidelines to the Management of Unstable Angina and Non-ST-Elevation Myocardial Infarction. Eugene Braunwald. *Circulation.* 2003;108

Current Concepts: ST-Segment Elevation in Conditions Other Than Acute Myocardial Infarction Wang K., Asinger R. W., Marriott H. J.L. *New England Journal of Medicine* 2003; 349:2128-2135, Nov 27, 2003.

Inflammation, Atherosclerosis, and CAD. Hansson G. K. *New England Journal of Medicine* 2005; 352:1685-1695, Apr 21, 2005.

Use of the Electrocardiogram in Acute Myocardial Infarction. Zimetbaum P. *The New England Journal Of Medicine*,348(10):933-940.2003 March 6

Cardiovascular Complications of Cocaine Use - Lange R. A., Hillis L. D. *New England Journal of Medicine* 2001; 345:351-358, Aug 2, 2001.

Infective endocarditis

Infective endocarditis. Moreillon, Y. *Que The Lancet*, Volume 363, Issue 9403, Pages 139-149 P.

Pericarditis

Acute Pericarditis Lange R. A., Hillis L. D. New England Journal of Medicine 2004; 351:2195-2202, Nov 18, 2004.

Myocarditis

Myocarditis Feldman A. M., McNamara D. New England Journal of Medicine 2000; 343:1388-1398, Nov 9, 2000.

Cardiomyopathies

Reference- Harrison's Textbook of Internal Medicine

ACC/AHA Guidelines for the management of Heart Failure. JACC 2022; 79:e263-421.

AHA/ACC Guideline for the Diagnosis and treatment of Patients With Hypertrophic Cardiomyopathy. JACC 2020; 76:e159-e240.

Restrictive Cardiomyopathy Kushwaha S. S., Fallon J. T., Fuster V. New England Journal of Medicine 1997; 336:267-276, Jan 23, 1997.

Hypertrophic Obstructive Cardiomyopathy Nishimura R. A., Holmes D. R. Jr. New England Journal of Medicine 2004; 350:1320-1327, Mar 25, 2004.

Valvular Disorders

ACC/AHA Guidelines for the management of valvular heart disease . JACC 2021, 77:450-500.

ACC/AHA and ESC/EACTS Guidelines for the management of Valvular Heart Diseases. JACC 2023,82:721-734.

Aortic Stenosis Carabello B. A. New England Journal of Medicine 2002; 346:677-682, Feb 28, 2002.

Valvular Heart Disease Carabello B. A., Crawford F. A. New England Journal Medicine 1997; 337:32-41, Jul 3, 1997.

Novel approaches to cardiac valve repair: from structure to function: Part I. Circulation. 109(8):942-50, 2004 Mar 2. Yacoub MH. Cohn LH.

Novel approaches to cardiac valve repair: from structure to function: Part II. Circulation. 109(9):1064-72, 2004 Mar 9 Yacoub MH. Cohn LH.

Hypertension

Harrison's Textbook of Internal Medicine

Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults. JACC; 2018:e127-e248

Hypertensive emergencies: diagnosis and management. Phillips RA. Greenblatt J. Krakoff LR. Progress in Cardiovascular Diseases. 45(1):33-48, 2002 Jul-Aug.

Endothelial Dysfunction

Role of endothelial dysfunction in atherosclerosis. Davignon J; Ganz P. Circulation 2004 Jun 15;109(23 Suppl 1):III27-32.

Arrhythmias - Ventricular Tachycardias

Wide QRS complex tachycardias. Gupta, AK, Thakur, RK. Med Clin North Am 2001; 85:245

Ventricular tachycardia versus supraventricular tachycardia with aberration: electrocardiographic distinctions. In: Cardiac Electrophysiology From Cell to Bedside. Miller, JM, Hsia, HH, Rothman, SA, et al. Zipes, DP, Jalife, Jose (Eds), W.B. Saunders, Philadelphia 2000. p.696

A new approach to the differential diagnosis of a regular tachycardia with a wide QRS complex. Brugada, P, Brugada, J, Mont, L, et al. Circulation 1991; 83:1649.

Supraventricular Tachycardias

Supraventricular tachycardia. Ganz, LI, Friedman, PL. New England Journal of Medicine 1995; 332:162.

Pre-operative Evaluation Before Non-cardiac Surgery

ACC/AHA Guidelines for Non-Cardiac Surgery. **JACC 2014, 62, e77.**

Atrial Fibrillation

ACC/AHA Guidelines for the management of atrial fibrillation . JACC 2014, 64, e1.

Atrial Fibrillation. Falk R. H. New England Journal of Medicine 2001; 344:1067-1078, Apr 5, 2001.

A Comparison of Rate Control and Rhythm Control in Patients with Atrial Fibrillation. The Atrial Fibrillation Follow-up Investigation of Rhythm Management (AFFIRM) Investigators. New England Journal of Medicine 2002; 347:1825-1833, Dec 5, 2002.

Implantable Cardioverter-Defibrillator

Implantable Cardioverter-Defibrillators. DiMarco J.N Engl J Med 2002; 347:1825-1833, Dec 5, 2002.

Syncope

Neurocardiogenic Syncope. Grubb B. P. New England Journal of Medicine 2005; 352:1004-1010, Mar 10, 2005.

Syncope. Kapoor W. N. New England Journal of Medicine 2000; 343:1856-1862, Dec 21, 2000

Heart Failure

ACC/AHA Guidelines for the management of CHF . JACC 2013, 62, e147.

Heart Failure. Jessup M., Brozena S. New England Journal of Medicine 2003; 348:2007-2018,

ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult [ACC/AHA]. Acc.org

Aldosterone in Congestive Heart Failure. New England Journal of Medicine 2001; 345:1689-1697, Dec 6, 2001

Hormones and Hemodynamics in Heart Failure. Schrier R. W., Abraham W. T. New England Journal of Medicine 1999; 341:577-585, Aug 19, 1999.

Use of plasma brain natriuretic peptide concentration to aid in the diagnosis of heart failure. Shapiro BP. Chen HH. Burnett JC Jr. Redfield MM. Mayo Clinic Proceedings. 78(4):481-6, 2003 Apr.

Diastolic Heart Failure Aurigemma G. P., Gaasch W. H. New England Journal of Medicine 2004; 351:1097-1105, Sep 9, 2004.

Electrocardiography

Marriot's Textbook of Practical Electrocardiography

IV. Evaluations.

All residents are evaluated by their peers, junior and senior, fellow and attendings. This is done using E-Value, our on-line electronic evaluation process which mirrors ABIM's recommended resident issue evaluation. The use of our on-line evaluation system allows a more timely process of evaluation but is never intended to replace personal feedback that would come from learners at all levels. In addition, this allows us to track progress for residents and to give more specific feedback on areas of performance.

V. Rotation Specific Competencies. – link to learning objectives document

- A. Patient Care. Cardiology consultation rotation allows residents to evaluate and manage patients from a consultant's role.
- B. Medical Knowledge. Residents will be expected to utilize their medical knowledge in their initial evaluation and apply their knowledge to the management of the patient.
- C. Professionalism. The inpatient cardiology service requires a commitment to professionalism while providing care to terminally ill patients. Providing the best care for those patients requires that their overall quality of life be considered which often leads to end of life issues.
- D. Interpersonal Communication Skills. Residents will need to be able to work with not only standard inpatient interactions with nurses, aides, pharmacists, etc, but also echocardiography technicians, coronary catheterization team, and electrophysiology team.
- E. Practice-Based Learning. Due to the consultants role being more peripheral in nature, often presents an opportunity for difficult questions or previously unencountered clinical situations to arise. This affords the residents an opportunity to pursue practice-based learning.
- F. System-Based Practice. The inpatient cardiology service offers training in care for patients in an ICU setting. Also the multidisciplinary nature of this specialty affords residents the opportunity to work closely with community physicians, social workers, case managers and other specialist.

Reviewed and Revised by: Dr. Carhart Date
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