ACS

The ACS service provides care to patients with a variety of cardiac diseases including management of risk factors for disease, ischemic heart disease, cardiac dysrhythmias, cardiomyopathies, valvular heart disease, myocarditis, pericarditis, endocarditis, and hypertension. The service provides residents the opportunity to become proficient in the management of multiple cardiac abnormalities with patients aged 18 and older from varying ethnical and cultural backgrounds of both male and female genders. The service has coverage by cardiologists with extensive subspecialty training including interventional cardiology and EPS training by:

Daniel Villarreal, MD	Division Chief
Luna Bhatta	Clinical Assistant Professor of Medicine
Robert Carhart Jr., MD	Clinical Associate Professor of Medicine
Robert Eich, MD	Professor of Medicine
Charles Fruehan, MD	Associate Professor of Medicine
Hani Kozman, MD	Assistant Professor of Medicine
Saktipada Mookherjee, MD	Professor of Medicine
Harold Smulyan, MD	Professor of Medicine

I. Educational Purpose

The general internist may be responsible for management of more complex cardiovascular disorders that require intensive hemodynamic monitoring (for example, balloon-tipped pulmonary artery catheters).

II. Learning Venue

A. Rotation Description-The ACUTE CARDIOLOGY SERVICE team typically consists of 3-4 members including the attending, a fellow, a senior resident, possibly 1 intern, and 1-3 medical students. The patient population is diversified. The average number of patients is 4-6.

Expectations of PGY-1 The intern is expected to write daily progress notes on each patient admitted to the service with an extensive knowledge of the patients including laboratory results and any special testing done while in the hospital. They will be required to pre-round on the patients in order to facilitate morning rounds on a daily basis. They will be responsible for presenting new patients to the team as well as old patients during morning rounds. They will be responsible for signing out the team's patients to the night float and discharging patients when medically stable. They will play a role in the education of the medical students as well as themselves on a daily basis.

Expectations of Senior Residents-The residents have the same expectations as the interns in addition to their supervisory role. They will be responsible for teaching the interns, students and the team as a group. The will oversee all duties of the team and ensure quality medical care with timely and appropriate discharge planning. They will be responsible for timely dictations of discharge summaries. They will also partake in the admission of patients to other teams as required by the admitting resident. Senior residents are expected to model professionalism, interpersonal and communication skills, and the style of evidence based practice.

B. Teaching Methods

1. Patient care and attending rounds - Work rounds will begin at 0730 daily. The entire team including the attending will meet in the ACS. Each patient will be examined and discussed at the bedside. Teaching will be

done at all levels from the attending to the medical student during rounds with the attending playing a predominant role. Teaching will include proper interview techniques, physical exam skills, laboratory interpretation, note writing and didactic teaching. Formal teaching will be available in the form of lectures and conferences including: a daily noon conference with a wide range of medical topics, a Coronary Catheterization Conference every Monday from 0900-1000, an Echocardiography Conference every Monday from 1200-1300, an EKG Conference every Tuesday from 1200-1300, and a Cardiology Fellow's Conference every Friday from 1600-1700. Additional teaching will come in the form of formal brief presentations by the attending, resident, intern and students to the team as a group throughout the week. The presentations will be based on clinical problems or general cardiology topics encountered while caring for specific patients.

2. Recommended Reading

CAD, MI, Unstable Angina and Chest Pain

Chronic stable angina. Abrams J. *New England Journal of Medicine*. 352(24):2524-33, 2005 Jun 16.

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

Restrictive Cardiomyopathy

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

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

Valvular Disorders

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

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.

Atrial Fibrillation:

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

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

3. Unique Learning Opportunities - In addition to the conferences listed above, the inpatient cardiology service provides several unique opportunities. Team members have access to all cardiac catheterizations including angioplasties and stenting. They also take care of patients in an ICU setting including patients on ventilators and IABPs. Throughout most of the year there is a pharmD graduate and/or student present during rounds to provide detailed pharmacological information.

III. Mix of Diseases-The following list includes most of the diseases encountered while on the inpatient cardiology service.

A. Common Clinical Presentations
Abnormal heart sounds or murmurs
Chest pain
Dyspnea
Effort intolerance, fatigue
Hypertension
Intermittent claudication
Leg swelling
Palpitations
Peripheral vascular disease
Risk factor modification
Shock, cardiovascular collapse
Syncope, lightheadedness

B. Procedures
Advanced cardiac life support
Insertion of balloon-tipped pulmonary artery catheter (optional)
Insertion of temporary pacemaker (optional)
Stress electrocardiography (optional)
Echocardiography
Electrophysiology testing
Left ventricular catheterization and coronary angiography
Nuclear scan wall motion study
Right ventricular catheterization (including flotation catheter)
Stress electrocardiography and thallium myocardial perfusion scan
Tilt-table physiology study
External Pacing

IV. Educational Content

Arrhythmias
- Atrial (flutter, fibrillation, etc)
- Conduction abnormalities
- Pacemaker management
- Ventricular

Congenital Heart Disease
Congestive Heart Failure
- Acute pulmonary edema

Chronic congestive heart failure
- Diastolic
- Systolic

Coronary Artery Disease
- Angina pectoris, chronic stable
- Angina Pectoris, unstable
- Myocardial infarction, complicated
- Myocardial infarction, uncomplicated

- Myocardial infarction follow up
- Postoperative care (CABG, PTCA)

Endocarditis

Hypertension
- Chronic stable hypertension
- Hypertensive crisis
- Secondary Hypertension

Myocardial disease
- Cardiomyopathy
- Myocarditis

Pericardial Disease
- Acute pericarditis
- Pericardial Tamponade

Preoperative evaluation of the cardiac patient

Vascular Disease
- Aneurysm (atherosclerotic, mycotic)
- Aortic Disease
- Arterial insufficiency
- Chronic venous stasis
- Deep Venous Thrombosis
- Dissecting Aneurysm
- Valvular heart disease

Patients with chest pain of unknown etiology

Pulmonary hypertension

Skills
- Diagnosis and management of angina, unstable angina and acute MI (Acute Coronary Syndromes)
- Diagnosis and management of acute and chronic CHF
- Diagnosis and management of acute and chronic atrial fibrillation/flutter
- Diagnosis and management of life threatening ventricular and atrial arrhythmias as outlined in the ACLS protocol
- Diagnosis and management of patients with chest pain of unknown etiology
- Evaluation of markers of myocardial injury
- Indications for angioplasty, CABG and medical therapy in patients with CAD
- Recognition of infarct patterns on a surface 12 lead EKG
- Interpretation of PA catheter waveforms
- Post-MI evaluation, risk stratification and management
- Indications for noninvasive and invasive cardiac evaluation
- Complications of cardiac catheterization and PTCA

IV. Method of Evaluation

Six core competencies are used for evaluation of team members. Interim evaluations are done throughout the rotation for praise of outstanding work and correction of substandard performance. At the end of each rotation all team members complete formal evaluations of each team member using the web-based E-value evaluation software.

V. Rotation Specific Competencies

Patient Care-Members of the ACS service must learn to treat some of the most complex medicine patients. Many of the patients found on the service have multiple diseases linked with or caused by their concomitant heart disease. This requires team members to have an integral understanding of the patient's entire physical well being rather than simply one perspective.

Medical Knowledge-Additional medical knowledge required to master while on the inpatient cardiology service includes understanding IABP, pacemakers, EPS, and cardiac catheterization.

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.

Interpersonal and communication skills-With consideration of the above, members of the inpatient cardiology service need to hone their communication skills not only with patients but also with family members in order to discuss sensitive topics such as end of life issues.

Practice based learning-Link to competency document.

Systems based learning-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.

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