I. Educational Purpose:

Cardiovascular diseases are the most common forms of disease in the United States. The goal of resident training on the cardiology consultation service is to train the residents to recognize and treat a wide variety of simple to complex cardiovascular diseases that are present in patients on all services in the hospital. Appropriate conduct of the consultant in relation to patients on other services who are the primary responsibility of other physicians is also emphasized.

II. Teaching Methods:

A. Supervised Direct Patient Care Activities: Residents will learn through direct patient care with attending supervision. Resident will first evaluate the patient and then present the patient to the attending for discussion during daily teaching and management. During teaching rounds, history taking skills are reviewed and residents receive instruction and feedback. Differential diagnoses are constructed, and the etiology, pathogenesis (including environmental, behavioral, occupational, and socioeconomic issues), clinical presentation and natural history of the disease is discussed. Methods of assessing the patient’s prognosis and risk are discussed, and indications for requesting further diagnostic tests are also discussed. Potential treatments, including pharmacologic and behavioral, are discussed along with the clinical evidence for each treatment.

B. Bedside Physical Exam and Cardiac Procedures Teaching: During bedside teaching, each patient is briefly represented and physical examination is emphasized. The patients are examined in the presence of the attending, and pertinent exam skills and physiology are reviewed. All pertinent cardiology procedures, such as electrocardiograms, echocardiograms, nuclear scintigrams, and cardiac catheterizations are reviewed, and management recommendations are made.

C. Cardiology Teaching Conferences: There are also three weekly cardiology teaching conferences that the resident will attend. These include a general cardiology conference, an imaging conference (cath, echo, electrophysiology, nuclear), and a research seminar. There is also a monthly journal club where recent important articles are rigorously discussed.

III. Educational Goals and Objectives

The cardiology consult service will focus on patient evaluation and management in a diverse
clinical setting with an interdisciplinary staff. The rotation will consist of three components: 1) inpatient, 2) cardiology procedures, 3) outpatient specialty clinics. Hospital skills will emphasize the ability to manage patient across multiple specialties, with the residents functioning as the specialist with attending supervision. Cardiology fellows are also part of the inpatient consult service and act as an additional educational resource for the residents. Outpatient skills will emphasize the ability to manage patients with commonly seen, but complex medical problems. Emphasis will be upon skills required of a general internist including history taking, physical examination, formation of a differential diagnosis, therapeutic intervention, cost effective management, and procedures such as electrocardiography and exercise stress testing.

B. Rotation Specific Competencies:
The following areas will be evaluated to determine the progress of each resident at the end of the rotation. As the rotation is taken only once by residents at all levels of training, there are no PGY-year specific competencies. By the end of the rotation, the resident will be able to demonstrate the following competencies:

- **Patient Care**
  - Clinical skills –
    - obtains accurate and complete information though medical interviews, physical examination, medical records review appropriate to presenting complaint.
    - Performs procedures safely and considerately
    - Reviews all available records and test results in timely manner
    - Able to perform complete cardiovascular exam of heart and vascular system.
    - Able to assess jugular venous pressure
    - Able to recognize common heart sounds and murmurs (AS, AI, MR, S3, S4)
    - Able to read most ECGs. Demonstrates structured approach to ECG reading.
  - Patient management skills - synthesizes the case and combines the scientific and clinical fund of knowledge; demonstrates sound clinical judgment; incorporates patient preference; able to integrate patient care
    - Able to describe the approach to managing atrial fibrillation with rapid ventricular response, including rate control, rhythm control, and indications for and goals of anticoagulation
    - Able to describe the approach to management of acute and chronic CHF
    - Able to evaluate and manage tachy- and brady-arrythmias
    - Able to demonstrate appropriate pre-operative cardiac evaluation

- **Medical Knowledge**
  - Knowledge base in Internal Medicine and Cardiology
    - Can describe management of common cardiac conditions, including CHF, Acute coronary syndromes, atrial fibrillation, bradycardia, aortic stenosis, mitral stenosis, acute chest pain, tachycardia.
    - Can describe differential diagnosis of elevated troponin
    - Knows risk and benefits of cardiac catheterization and noninvasive ischemic testing
    - Knows when to use invasive imaging (catheterization) versus using noninvasive ischemia testing
    - Can describe pathophysiology of congestive heart failure and acute
coronary syndromes
  o Interest in learning and the mechanism of disease
  o Applies an open-minded and analytical approach to acquiring knowledge
  o Accesses and critically evaluates current medical information and scientific evidence

• Practice-Based Learning and Teaching
  o Critiques own performance, especially on ECG interpretation
    ▪ Identifies personal areas of weakness in knowledge, asks for help when needed, and performs focused reading for self-improvement throughout the rotation as demonstrated through patient care discussions with fellow and attending.
  o Receptive to constructive criticism
  o Learns from errors
  o Uses errors to improve patient care on both a personal and system-wide level
  o Uses information sources effectively to support patient care decisions and to educate self, patients and other physicians

• Interpersonal and Communication Skills
  o Develops a good working relationship and rapport and communicates clearly with other physicians, health professionals and patients
    ▪ Contacts primary team after rounding with attending/team to provide impressions and recommended treatments
  o Presents cases concisely and in a well-thought out manner
  o Maintains comprehensive, timely and legible medical records

• Professionalism
  o Demonstrates respect, compassion and integrity in working with patients, families, colleagues and other health professionals regardless of their background
  o Adheres to principles of confidentiality, scientific and academic integrity and informed consent
  o Recognizes and identifies deficiencies in peer performance in a constructive manner
  o Takes responsibility for patient care; acknowledges mistakes

• System-Based Practice
  o Able to work with and within the health care system at UC Davis Medical Center to deliver optimal patient care
  o Participates actively in improving the health systems to optimize patient care.

IV. Educational Content

A. Mix of diseases, patient characteristics, and types of clinical encounters, procedures, and services: A very wide variety of cardiology problems are seen on the consult service. Patients are male and female, young and old, with and without known cardiac disease, and with acute and chronic problems. While the entire spectrum of cardiac disease is encountered on the consult service, common problems seen include preoperative evaluation of cardiac patients for noncardiac surgery, management of post-operative complications, assessment of chest pain,
management of arrhythmias such as atrial fibrillation and ventricular tachycardia, management of congestive heart failure, management of common valvular diseases, and management of pulmonary hypertension. The patient population includes diverse ethnic groups (e.g., Hispanic, Asian, African-American, Middle Eastern, Eastern European). The hospital has an active interpreting service for non-English speaking patients.

Clinical encounters include inpatients (intensive care unit, general bed, post anesthesia recovery room) and outpatients (emergency department, anesthesia pre-op). The consult requests may be emergent, urgent, or elective. Residents may participate in the performance of pericardiocentesis, central line placement, or temporary pacemaker placement under the direct supervision of the cardiology attending physician and/or the cardiology fellow.

V. Ancillary Education Materials

A. Reading lists, pathological material, and other educational resources to be used: The residents are referred to the American College of Cardiology website (http://www.acc.org/qualityandscience/clinical/statements.htm) where up to date practice guidelines can be found. These guidelines form the basis for formal instruction in risk management, cost effectiveness, and health care policy. The resident will read independently to answer questions that may arise about patient care in the clinic setting using the above mentioned resources. There are some teaching ECGs in the Division library.

The resident attends the didactic and case-based conferences of the Division previously described. The Division library also has numerous cardiology textbooks, as well as several journals, such as Circulation, Journal of the American College of Cardiology, and the American Heart Journal, for reference. Internal Medicine maintains the Mandelbaum Library on the 6th floor of the South wing which contains numerous cardiovascular textbooks and on-line computers, and the Hospital maintains a medical library in the Education Building. Lastly, the health system has on-line access to cardiology journals, textbooks, and UpToDate.

VI. Method of evaluation of residents’ performance:

The written learning objectives and expectations will be reviewed with each resident at the beginning of the rotation. Residents are given feedback with each case presented on areas needing further study and improvement. Using the standardized Internal Medicine evaluation form, residents are evaluated for clinical judgment, medical knowledge, history taking skills, physical examination skills, procedural skills, humanistic qualities, professional attitudes and behavior, medical care, audit of the medical records, and overall clinical competence. This evaluation is discussed with the resident at the end of the rotation and earlier feedback on progress is provided during the rotation. The methods used to perform these evaluations will include direct observation on teaching and management rounds active participation during discussions on teaching rounds, chart audit and review, and input from peers and support personnel. The evaluation form is forwarded to the Training Director. The residents will evaluate the rotation and each attending at the end of the rotation.

VII. Structure of Rotation
A. Clinical experience description: The service is 2 to 4 weeks in duration. There is one cardiology fellow and a variable number (usually 2) of residents and medical students on the service. On a rotating call, the housestaff are responsible for consults requested from 8 AM to 5 PM, seven days a week. Night call is provided by the cardiology inpatient service on-call resident. Rounds are made daily and are variable in length depending on the number and complexity of patients seen, but generally last 4 to 6 hours. A wide variety of clinical problems are seen by the residents on this service, all being ones encountered by patients cared for by other services which pose diagnostic or management problems to those services. The patients seen are predominantly inpatients and include the spectrum listed under the Mix of Diseases section. The cardiology consult resident on call is responsible for seeing the patient as soon as possible after receiving the request for consultation. In performing the patient evaluation, the resident will review the medical record and discuss the patient with the nurse and requesting physician. The cardiology fellow is always available for questions or clarifications. The resident will review cardiology tests with the attending in the catheterization, echocardiography, electrocardiography, and nuclear laboratories. Following discussing the case with the cardiology attending, the resident’s evaluation of the patient is placed in the medical record. The requesting physician is then contacted by the resident and management recommendations are discussed.

Rounds will not be conducted during the cardiology conferences or during the Internal Medicine Monday afternoon conferences so that the residents can attend these conferences.

Residents not on call are expected to attend two half day clinics of their choice each week.

B. Definition of the residents’ supervision by the faculty: The cardiology consult attending is responsible for each patient seen on the consult service. The attending reviews the resident’s recommendations daily and approves or amends them as needed before they are made to the requesting service. All consultation functions by the resident are performed under the direct supervision of the cardiology consult attending, including history, physical examination, procedures, interpretation of test, and recommendations made. All patients on whom consultations are requested are seen within 12 hours and acutely ill patients are seen immediately by the resident, usually with the cardiology fellow in attendance. Patients are presented to the cardiology attending within 12 hours, or sooner if urgent. The consult attending is available at all times by pager. When the consult attending is in clinic, the cardiology inpatient and cardiac catheterization attendings provide back up to staff emergent patients.

C: Integration of medical problems, health promotion, and cultural, socioeconomic, ethical, occupational, environmental, and behavioral issues: Comprehensive care of the patient is emphasized which requires an understanding of the context of the illness (patient’s culture, habits, attitudes regarding medical care). The social and family history of each patient is presented and accounted for in management recommendations. Social service consultation is requested for help in selected cases of financial hardship so that care is not limited by economic circumstances.

D. Teaching rounds and conferences: Teaching rounds are held daily prior to management rounds. There are three weekly cardiology teaching conferences that the resident will attend. These include a general cardiology conference, an imaging conference (cath, echo, electrophysiology, nuclear), and a research seminar. There is also a monthly journal club where recent important articles are rigorously discussed.
E. Emphasize the importance of humanistic qualities: Respect for patients and their families will be a cornerstone of the approach to patient management transmitted to the residents. This will be discussed in rounds away from the patients and demonstrated when the patient is seen by the resident and residents with the faculty member. This approach will be based on sensitivity, courtesy, respect, and empathy for patients and their families.