CARDIOVASCULAR MEDICINE DIVISION 2013-2014

FACULTY

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Luis Castellanos, M.D.          Ehtisham Mahmud, M.D., Chief
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Lori Daniels, M.D.              William Penny, M.D.
Anthony DeMaria, M.D.           Kirk Peterson, M.D.
Sylvia Evans, Ph.D.             Brian Petrich, Ph.D. (R)
Greg Feld, M.D.                 Ajit Raisinghani, M.D.
Leda Felicio, M.D.              Robert Ross, M.D.
Ulrika Green, M.D.              Farah Sheikh, Ph.D. (R)
Barry Greenberg, M.D.           Jorge Silva Enciso, M.D.
Kirk Hammond, M.D.              Charles Tate, M.D.
Masahiko Hoshijima, M.D., Ph.D. (R) Pam Taub, M.D.
Jonathan Hsu, M.D.              Sam Tsimikas, M.D.
Mohit Jain, M.D., Ph.D. (R)     Francisco Villarreal, M.D., Ph.D. (R)
Andrew Kahn, M.D., Ph.D.        Thomas Waltman, M.D.
William Keen, M.D. (Kaiser)     Joel Wilson, M.D.

FELLOWS

Heart Failure:                    Patrick McCann, M.D.

EP:                               Thomas McGarry, M.D.
Nicholas Olson, M.D.              Amir Schricker, M.D.
                                     Gautam Lalani, M.D.

Interventional:                   Ryan Reeves, M.D.
Arturo Dominguez, M.D.            John Bahadorani, M.D.

1st Year                          Gordon Ho, M.D.
Jenny Papazian, M.D.              David Cork, M.D.
Lawrence Ang, M.D.                Tina Baykaner, M.D.

2nd Year                          Bradley Nelson, M.D.
Michael Gibson, M.D.              James Kim, M.D.
                                     Anya Narezkina, M.D.

3rd Year                          Brendan Daly, M.D.
Jesse Naghi, M.D.                 Peter Morcos, M.D., Chief Fellow
                                     Yang Xue, M.D.

General Cardiology                Daniel Blanchard, M.D., Program Director
Electrophysiology                 Greg Feld, M.D., Program Director
Interventional                    Ehtisham Mahmud, M.D., Program Director
Heart Failure                     Eric Adler, M.D., Program Director
Fellowship Coordinators           Lauren Kaufman: General, Interventional, & Heart Failure
                                     Gini Roberts: Electrophysiology
CLINICS

Fellows attend clinic at the VA and Hillcrest (Ambulatory Care Center/Medical Offices South). Each fellow attends one clinic a week, alternating between Hillcrest and the VA. Clinic at Hillcrest starts at 1:00 pm on Wednesdays and at the VA at 1:00 pm on Tuesdays.

It is the fellow’s responsibility to inform the clinic of vacation times well in advance so that your clinic may be rescheduled.

CONFERENCES

Fellows are required to attend all of the following conferences.

Throughout the year a core curriculum series is held for the fellows on Tuesdays at 7:30 am in the Cardiology Conference Room at Hillcrest or the SCVC 4th floor conference room.

Cardiovascular Medicine Grand Rounds are held every Friday at 8:00 am in the East Campus Office Building during the academic year.

The Resident Core Lectures are held the 3rd Wednesday of each month from 12:00 – 1:00 pm in the UH Auditorium and VAMC, 3rd Floor Conference Room. Attendance is required for ACGME certification.

Cath Conference is held every Thursday at 4:30 pm in the East Campus Office Building. Cases to be presented will be selected on Wednesday. It is the responsibility of the cath fellow to present the clinical data as well as relevant literature citations. The echo fellow is responsible for editing the relevant echo images for presentation. The cath fellow must be present at Cath Conference.

Friday research conference is held at 11:30 am on Campus (CNCB Large Conference Room) during the academic year. Fellow attendance is required except in case of an emergency.

ON-CALL SCHEDULES

As required by UCSD Communications, please adhere to the following:

Any changes to the call schedule need to be given to Lauren Kaufman at 858-657-8030. If a change is made after normal work hours, you need to contact the operator to enter the change (x36444).

PROCEDURE LOGS

According to ACGME requirements, fellows must keep a log of all procedures, including cardiac catheterizations and percutaneous interventions, TEEs, cardioversions, pericardiocenteses, right heart catheterizations, and placement of arterial and central venous sheaths (essentially, any activity where a procedure note is dictated. Be sure to include the date of the procedure, the attending, the indication for the procedure, and any complications. These logs will be reviewed with the fellowship director twice a year and should be forwarded to Lauren Kaufman (lekaufman@ucsd.edu) yearly. During the Noninvasive Lab Rotation the echo interpretation program will keep numbers of echo and stress echo procedures, but make sure your name is selected on the echo program’s “Home Page.”
EVALUATIONS

According to ACGME requirements, evaluations are to be submitted on a monthly basis. You will receive an email generated through the New Innovations Residency Management Program notifying you that an evaluation needs to be completed. Please contact Lauren Kaufman at 858-657-8030 for questions regarding New Innovations and the procedure for completing an evaluation. Evaluations are not optional but are required by all training programs to comply with accreditation requirements.

ABSENCES

Fellows are granted four weeks of vacation per year. Vacation requests must be submitted in writing or emailed to the fellowship director and cc’d to Dr. Mahmud. It is your responsibility to obtain coverage.

RESEARCH

Fellows are required to submit to Dr. Mahmud in advance their plans for research months. This should be signed by the research mentor. Fellows that are doing more than two months of research in a year are required to submit a quarterly progress report, signed by the research mentor, at the beginning of the new quarter.

Updated 2013 EM
The Sulpizio Family Cardiovascular Center – CV-CCU/Cardiovascular Medicine Inpatient Service is responsible for care of patients with cardiovascular diseases that are admitted to the Sulpizio Cardiovascular Center (CVC) as described below. Patients will be primarily located in:

- The Cardiovascular Intensive Care Unit (3A)
- The Progressive Care Unit on 3B-CVC
- Overflow patients on the Progressive Care Unit 4A/B-CVC

The team assigned to the Sulpizio Family Cardiovascular Center – CV-CCU/Cardiovascular Medicine Inpatient Service will consist of the following:

- An Internal Medicine Residency team
- A General Cardiology Fellow
- A Physician’s Assistant,
- A General Cardiology Attending Physician
- An Advanced Heart Failure/Heart Transplant Attending Physician

The Cardiovascular Intensive Care Unit is located on the 3rd floor of the (CVC). It is a combined cardiovascular intensive care unit with Cardiology and Cardiothoracic (CT) Surgery. The CCU portion of the unit is directed by Dr. Lori Daniels. The CT Surgery portion of the unit is directed by Dr. Anthony Perricone. The CCU/cardiology team is responsible for the care of patients on the general cardiology and congestive heart failure services, and assists with patients who are recovering from CT surgery (CABG and valve replacement).

Progressive Care Unit-3B-CVC: Patients on the Cardiovascular Medicine service being managed outside of the Cardiovascular Intensive Care Unit will be primarily managed on 3B-CVC which is a progressive care unit. Overflow of cardiac patients will be managed on the 4th floor CVC progressive care beds.

The purpose of this orientation packet is to clarify and facilitate the workings of the unit, as well as clarify the responsibilities of the CCU/Cardiology Fellow, Residents and Interns.

**Nurse Manager:** Mobe Montesa  
(CV-ICU; 3A)  
Office: 858-657-8324  
Pager: 619-290-1044

**Asst Nurse Manager:** Laura Lubomirsky  
(CV-ICU; 3A)  
Office: 858-657-6770

**Nurse Manager:** Aldrin Poblete  
(3B)  
Office: 858-657-8428  
Pager: 619-290-1413

**Nurse Manager:** Peter Petropolous  
(4A and B)  
Office: 858-657-8477  
Pager: 619-290-0206
Nurse Educator (CVC): Cassia Chevillon  
Office: 858-657-6727

Unit Phone Numbers:  
Tel: 858-657-8330  
Fax: 858-657-1226

Educational purpose and learning objectives

The educational purpose of this rotation is to train fellows in the treatment of inpatients with cardiac and vascular disease, particularly those who are critically ill and hemodynamically unstable. Learning objectives include competence in the optimal treatment of inpatients with CAD, acute MI, acute coronary syndromes, shock, congestive heart failure, critical limb ischemia, recent CT surgery, and valvular heart disease.

Teaching methods

Teaching methods include patient-specific instruction during CCU/cardiology rounds as well as didactic lectures during post-rounds teaching sessions. Fellows also attend cardiovascular catheterization conference and present cases at this conference during the rotation.

Disease mix/patient characteristics

The patient population on this service is quite varied. Both men and women are well-represented. The majority of patients are >60 years of age, but there is a significant minority of younger patients with CAD, nonischemic cardiomyopathy, endocarditis, valvular heart disease, and peripheral arterial disease.

Type of clinical encounters/procedures/services

The fellow, in combination with the Internal Medicine Residents, is involved in Emergency Department evaluations of patients with cardiovascular complaints, and is responsible (with attending supervision) for decisions regarding admission to the CCU/Cardiology service. **No patient may be discharged from the ED without discussion with a cardiology attending physician.** The fellow is the first point of contact for cardiology patients (except heart failure ones) admitted to the ED Observation Unit, and will be responsible for evaluating the patients and staffing them with the General Service Attending. The fellow is also responsible for daily evaluation of each patient on the service and helps to facilitate their care. Fellows are encouraged to participate whenever their patients undergo catheterization laboratory procedures. Urgent/emergent consultations requiring transfer from the Thornton Hospital to the SCVC are triaged by the fellow.

Level of fellow supervision by faculty

Under attending supervision, the fellow manages the CCU/cardiology service. Although attending supervision is constant, fellows are granted some leeway in clinical decision-making. Attending physician input and approval is required, however, for significant changes in management or referral for invasive testing.
**Reading list**

Braunwald’s “Heart Disease”
Hurst’s “The Heart”

**Pathological material and other educational resources**

Teaching files of interesting echocardiograms, angiograms, and stress tests are available on-line on the hospital's digital cardiac imaging system.

**Method of Fellow evaluation**

ACGME core competencies are evaluated monthly by the attending faculty. These evaluations are discussed with the fellows and forwarded to the program director. First-year fellows are expected to have a mean evaluation score of 5 or greater on the standard 1-9 scale of the 6 ACGME core competencies. Second-year fellows are expected to have a mean score of 6 or above; third-year fellows do not rotate on the CCU/cardiology service.

Expectations of fellow performance vary by year of training. First-year fellows are expected to have a basic understanding of cardiac pathophysiology, treatment of acute coronary syndromes, treatment of valvular heart disease, treatment of heart failure, and treatment of peripheral vascular disease and critical limb ischemia. Specifically, first-year fellows are expected to (1) master transthoracic echo imaging in acute coronary syndromes, valvular disease, and possible cardiac tamponade; (2) perform right-heart catheterization independently and left-heart catheterization under attending supervision; (3) provide cardiology consultations in the acute setting with substantial attending input and supervision, and (4) manage acute heart failure with substantial attending input and supervision. Second-year fellows are expected to be fully competent in the treatment of acute coronary syndromes, congestive heart failure, endocarditis, valvular heart disease, peripheral vascular disease, critical limb ischemia, and shock. Specifically, second-year fellows are expected to master both transthoracic and transesophageal imaging techniques in acute coronary syndromes, valvular disease and possible cardiac tamponade; (2) perform both right and left heart catheterization with minimal supervision, (3) provide cardiology consultations in acute settings with minimal attending supervision, and (4) manage acute heart failure with minimal attending input.

**Educational Purposes and ACGME Core Competencies**

Specific activities during this rotation that will enhance the fellows’ skills in the 6 core competencies include:

1. **Patient Care and Medical Knowledge:** The fellow will encounter a large group of patients with a wide variety of acute cardiovascular illnesses. The fellow will direct the care of these patients and assist in procedures performed. They will learn from the attending faculty during patient rounds and teaching rounds, and also from self-directed review of the literature.

2. **Interpersonal and Communication Skills:** The fellow will interact with medical staff, nurses, pharmacists, and other ancillary personnel. They will also communicate with patients’ families and cardiac surgery faculty. They will be expected to keep accurate, timely-signed medical records.

3. **Professionalism:** The fellow will gain experience in the respectful treatment of all the above-mentioned groups, and will also maintain accurate procedure logs and hospital privileges.
4. Practice-Based Learning: The fellow is expected to gain knowledge from self-directed literature review, and facilitate the education of internal medicine residents. The fellow will also present cases from the CCU during weekly catheterization conference and discuss pertinent literature.

5. Systems-Based Practice: The fellow will work within a team of health care professionals and participate in inpatient management, transfer facilitation (from UCSD Hillcrest campus and other referring facilities), and discharge planning. The fellow will be exposed to patient concerns such as cost of medication, ambulatory follow-up, and end-of-life issues.

CCU/CARDIOLOGY SERVICE: ADDITIONAL INFORMATION for FELLOWS

1. Bed allocation and triage in the CVC – ICU
Patients with acute myocardial infarction, PCI with sheaths in place, or with an IABP should be given priority for CCU beds. In general, patients with acute coronary syndrome and rising troponins should be sent to the CCU, and not to the floor. Patient welfare should be the predominant consideration in bed allocation. Post-PCI patients who have had sheaths removed in the Cath Lab can typically be placed on the progressive care unit (PCU). Cardiovascular patients have first priority for admission to the CVC-ICU, and we expect overflow from other services (Thornton ICU) to be minimal. We expect that this unit will frequently be at capacity. It is imperative to review the need of each patient for a critical care bed early in the day so that appropriate transfer to the PCU can be achieved in a timely manner. If no beds are available then patients need to be boarded in other units.

2. Admission to the Cardiology Service
All patients with primary cardiac problems should be admitted to the cardiology service. Patients who are enrolled in the heart failure program should be admitted to the heart failure service. Both services admit patients to the 3rd floor of the CVC (CCU and 3A). Patients with the following diagnoses require admission to the CCU:

A. Myocardial infarction, proven or highly suspected, with symptoms <48 hours.
B. Acute Coronary Syndromes (ST changes and elevated troponins). Mild troponin elevations without recurrent chest pain on treatment may be admitted to telemetry, if there is no ongoing chest pain and enzymes are not rising and the attending physician concurs.
C. Documented or suspected MI of any duration currently complicated by:
   1. Sustained VT (>30 seconds)
   2. Symptomatic arrhythmias
   3. Hypotension
   4. Thromboembolism
   5. Recurrent angina or dyspnea
   6. Other serious management problems with potential for high morbidity or mortality
D. Serious arrhythmias/conduction disturbances
E. Other severe cardiovascular disorder
   1. Acute pulmonary edema
   2. Acute pulmonary embolism
   3. Acute hypertensive crisis
   4. Dissecting aneurysm
   5. Cardiac tamponade
   6. Tricyclic antidepressant overdose
   7. Any drug overdose with potential for serious cardiac complications
8. Endocarditis with overt heart failure or conduction abnormalities
9. Severe heart failure of any etiology
F. Angioplasty/coronary interventions during STEMI
G. Other cases which in the judgment of the CCU team have potential for either high mortality or morbidity or conversely, could benefit from intensive cardiac monitoring and therapy.

A patient with a “Do Not Attempt Resuscitation” order will not be excluded from the CCU when the patient has potentially reversible condition which necessitates CCU admission.

No guideline can envision all clinical situations. Use common sense, and when in doubt page the CCU attending. The CCU attending should be contacted when a bed shortage occurs.

Acceptance of admissions from community affiliated physicians is encouraged but contingent on approval from the CCU attending.

**Heart Failure Admissions**
Patients who are followed by a UCSD heart failure attending will be admitted to the heart failure service.

Patients with newly diagnosed heart failure will be admitted to the general cardiology service for the initial work-up. Patients who are followed by a general cardiologist at UCSD or who are new to UCSD will be admitted to the general cardiology service, except in cases where the primary cardiologist or transferring MD requests admission to the heart failure service. **Any transfers between the two subservices will be coordinated on an attending physician level.**

3. **Emergency Department Evaluations**
Most patients admitted to the CCU are admitted through the ED at the CVC or through the ED at Hillcrest. Every patient with chest pain of suspected cardiac etiology from the CVC ED must be evaluated by the CCU team. The CCU resident should evaluate the patient first. In cases where the patient presents with cardiac arrest, cardiogenic shock, or pulmonary edema, the ED may and is encouraged to page the CCU Fellow and/or the CCU attending directly in addition to the CCU resident. In the setting of a STEMI, the CVC ED physician should call the CCU attending directly to activate a “code STEMI.”

Patients who are admitted from the Hillcrest ED will arrive by ambulance and be taken directly to the 3rd floor of the CVC, without being re-evaluated in the ED at the CVC. The CCU team will be notified upon arrival of the patient, and must evaluate them within 30 minutes.

**In cases where the ED attending believes that the patient should be admitted but the cardiology fellow disagrees, the fellow must evaluate the patient in person and call the CCU attending.**

ECGs of CCU evaluations must be reviewed by the Fellow (ECGs may be faxed home).

All admissions to the CCU must be seen within 8 hours by the Fellow.

4. **ST Elevation Myocardial Infarctions**
For STEMI cases (including possible STEMIs, ie equivocal ECGs) the ED attending will page the CVC general attending directly. The attending is responsible for activating the cath lab, if necessary. The cardiology service should aim for activating the cath lab within **5 minutes** of receiving the initial page from the ED.
In cases where there is not a clear-cut STEMI, and/or further information or evaluation is needed prior to activating the cath lab, the fellow or attending must clearly document the need for this delay in the chart.

5. ED Observation Patients
ED physicians will determine which patients they believe are suitable for admission to the ED Observation Unit (“ED Obs”) using pre-specified inclusion/exclusion criteria to identify low-risk patients. The ED attending will call cardiology for consultation on ED Obs patients as follows:

- Heart failure patients – The Advanced Heart Failure Attending will be called directly; if they are unavailable, the Heart Failure Fellow or NP may be called.
- All other cardiology patients – the CCU fellow will be called. The fellow is responsible for evaluating the patient, and staffing the patients with the CVC General Attending.

For patients admitted overnight to the Obs Unit, the ED attending will call cardiology in the morning at change of shift (~7am). For patients admitted during the daytime, the ED will call cardiology as soon as they are admitted to the Obs Unit. The cardiology fellow and attending will be expected to round on the Obs Unit patients upon completion of their housestaff rounds at 10:00AM.

6. Daily Routine
8:00-10:00 am: CCU/Cardiology Attending Rounds
(On Tuesdays the fellow will arrive at 8:30)

10:00-11:00 am: Cardiomyopathy Service Rounds

It is important to identify the patients who are ready for discharge the night before in order to have discharge orders reviewed and signed on rounds.

7. Teaching Conferences for Housestaff
Tuesday (noon): didactic lecture

Thursday (noon): case based teaching

Thursday (4:30-6:00PM): Cardiovascular Catheterization Conference

Friday (8:00AM-9:00AM): Cardiovascular Medicine Grand Rounds

8. Nonteaching Patients and Resident Service Caps
Patients admitted by nonteaching attendings will not be followed by the housestaff. Patients who are admitted for routine post-procedure care (i.e. Interventional and EP) will be kept on the subspecialty service. Patients transferred from Hillcrest to the SCVC for PCI with a plan for next-day discharge will be managed by the Interventional Cardiology team, unless the Interventional attending physician decides otherwise. However, all patients will be evaluated by the housestaff if they become unstable, at the request of nursing or the attending physician.

Housestaff service is capped at 16 patients (maximum 4 critically ill in the CCU e.g. intubated, or with IABP and Swan Ganz catheter in place). The cap for CHF patients is 4 but does not apply if the service is not capped. Patients are moved from the teaching service to the fellow/PA service when the service is capped or close to it. Patients with limited teaching value should be
moved first. Once patients are moved to the fellow/PA service they cannot be placed back on the teaching service, unless there is a significant change in their level of care/status.

9. Invasive Procedures
The fellow must be present and supervise all central lines, including femoral arterial lines.

Attending presence must be requested whenever technical difficulties are encountered or expected. All pericardiocentesis procedures require attending presence, except during a code blue.

For billing purposes, only procedures in which the attending is present can be dictated with the attending as supervising the procedure.

Fluoroscopy requires the presence of a licensed fluoroscopy supervisor.

In emergency situations such as code blue, the most senior member may proceed without attending presence.

10. Orders
All verbal orders must be signed within 24 hours. All medical students orders must be cosigned by a physician.

A standard CAD order set is available and should be used for every CAD admission. In addition, patients with CAD need to have a Quality of Care (CQI) Form filled out to ensure and document compliance with national guidelines.

Special discharge ordersets are available for CAD/MI patients and should always be used to ensure compliance with evidence based guidelines (Get with the Guidelines Initiative).

11. Emergencies and Code Blue
All members of the CCU team must have received ACLS certification.

12. DNAR (Do Not Attempt Resuscitation) Orders
DNAR orders must be cosigned by an Attending Physician. A progress note must accompany the order and document discussion with the patient or appropriate family member.

13. Deaths
Notify the attending and fellow immediately. Notification of next of kin must be done by an MD (Resident or higher). An autopsy should be requested in all cases, and organ donation discussed with the family.

14. Additional CCU Fellow Responsibilities
1. Provide Consults and STAT echo coverage from 5 pm to 8 am and on week-ends/holidays. (Echo techs are on call but are only asked to come in if the cardiology fellow cannot obtain an adequate image for the relevant diagnosis.)
2. Inform the cardiac cath fellow of all possible catheterization cases the night before or as soon as possible in the morning.
3. Be a teaching resource to the housestaff and nursing.
4. Notify the primary cardiologist when one of their patients is admitted to the service.
5. Be familiar with ongoing clinical trials at UCSD and help identify possible candidates.
6. Fellows are required to attend all divisional teaching conferences.
Educational purpose and learning objectives:
The educational purpose of this rotation is to give the fellow the experience in dealing with patients with heart failure in all its stages and various presentations and to introduce them to pre-and post-cardiac transplantation evaluation and management. Specific learning objectives include gaining expertise in the following areas:

1) inpatient management of patients with decompensated heart failure,
2) determination of the need for and selection of devices including left ventricular assist devices, intra-aortic balloon and other investigational devices
3) inpatient consultation of patients with heart failure
4) emergency room evaluation of patients with heart failure,
5) outpatient management of heart failure patients
6) right heart catheterization and endomyocardial biopsy,
7) integration of results from invasive, noninvasive and blood tests in determining the presence, etiology and severity of heart failure
8) cost-effective management of hospitalized patients with cardiac disease
9) assessment of patients for cardiac transplantation
10) postoperative management of cardiac transplant recipients
11) outpatient management of transplant recipients
12) inpatient management of complications and long-term morbidities that occur in post-cardiac transplantation patients.

Teaching methods:
These include teaching rounds with attending staff and direct faculty supervision of procedures such as cardiac catheterization. The fellows will also attend 2 regularly scheduled half day heart failure and heart transplant clinics as well as didactic sessions and meetings, including weekly Heart Transplant Meeting, Referral Tracking Meeting and Heart Failure Didactic Conference.

Disease mix/patient characteristics:
The patient population seen at UCSD represents a broad and representative mixture of the heart failure population in that includes patients of varying age, gender, race, socio-economic status etiology of heart failure, severity of heart failure, etc. In addition, patients with heart failure due to systolic dysfunction as well as those with preserved systolic function are both well represented.

Type of clinical encounters/procedures/services:
Admissions, ER evaluations, consultations and out-patient visits are generally seen first by the fellow and then together with the faculty attending. Fellows are strongly encouraged to assist with procedures and are expected to directly review all primary data on patients referred for evaluation.

Level of fellow supervision by faculty:
Independent analysis of patient information by the fellow is encouraged, but all inpatients and consultations are seen by the faculty and reviewed with the fellow. All major clinical decisions are discussed by the fellow and faculty. Faculty will directly supervise procedures performed in the catheterization laboratory.
Level of fellow supervision by Senior Heart Failure Fellow:

The rotating general cardiology fellow on the service will be on service at the same time dedicated heart failure fellow. Inpatients will be distributed between the two fellows, with the perioperative and complicated patients being followed primarily by the dedicated heart failure fellow. The dedicated fellow will also help provide additional supervision to the rotating fellow.

Schedule

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Reading list:
Hosenpud and Greenberg’s “Congestive Heart Failure”
Greenberg and Barnard’s “Handbook of Heart Failure”
HF Fellow Handbook (see attached).
HF dropbox containing relevant recent and classic literature in heart failure, mechanical circulatory support and cardiac transplantation (fellow to be given access when starts rotation)

Lectures/Meetings:
Lectures/Meetings will include a weekly heart failure case conference, as well as a transplant selection meeting. In addition the fellow is expected to present 1-2 cases from the heart failure service during the weekly Cath Lab conference.
Call:
The fellow will take no overnight call. Home call will alternate weekly with the heart failure fellow. The rotating fellow will also be expected to come in 2 weekends of the month to assist with the inpatient service.

Pathological material and other educational resources:
Teaching files of interesting echocardiograms, angiograms, and stress tests are available on-line on the hospital's digital cardiac imaging system. Pre-transplantation cardiac biopsy specimens are reviewed on a bi-weekly basis during Referral Selection Meeting.

Method of resident evaluation:
ACGME core competencies are evaluated monthly by the attending faculty. These evaluations are discussed with the fellows and forwarded to the program director.

At the time of evaluation, first-year fellows are expected to have an introductory level of exposure to guidelines and treatment regimens for heart failure, as well and an introductory level of experience in the hemodynamic assessment of patients with heart failure and cardiac transplantation. Specifically, first-year fellows should (1) master the examination and evaluation of patients with heart failure with significant attending supervision and input; (2) perform right heart catheterization with minimal attending input and left heart catheterization with direct attending supervision; and (3) perform right heart biopsy under direct attending supervision. Second-year fellows are expected to show full competency in the treatment of patients with heart failure, as well as competency in performance and interpretation of right heart catheterization. Specifically, second-year fellows should (1) master the examination and evaluation of patients with heart failure with minimal attending supervision and input; (2) perform right and left heart catheterization with minimal attending supervision; and (3) perform right heart biopsy with minimal attending supervision.

Educational Purposes and ACGME Core Competencies
Specific activities during this rotation that will enhance the fellows’ skills in the 6 core competencies include:

1. **Patient Care:** The fellow will see between 4 and 8 outpatients during half-day clinic session at the UCSD cardiomyopathy/heart failure outpatient clinic. The fellows will also round on the inpatient heart failure service, and perform both right heart catheterizations and right ventricular biopsies in heart failure/transplant patients.

2. **Medical Knowledge:** The fellow will gain experience in both ambulatory and inpatient care and management of patients with heart failure. The treatment plan for each patient seen by the fellow will be reviewed by the faculty attending. The fellow will gain knowledge through discussions with faculty and also through didactic lectures, self-assessment case review sessions, and self-directed reading.

3. **Interpersonal and Communication Skills:** The fellow will interact with patients and their families, nursing staff, clinic staff, and pharmacists. They will be expected to keep accurate, timely-signed medical records, clinic dictations, and procedure reports.

4. **Professionalism:** The fellow will gain experience in the respectful treatment of all the above-mentioned groups, and will also maintain accurate procedure logs and their hospital privileges.
5. **Practice-Based Learning:** The fellow is expected to gain knowledge from self-directed literature review concerning interesting cases they encounter, and facilitate the education of internal medicine residents rotating on the CCU service. The fellow will also present cases and discuss pertinent literature during journal club or weekly catheterization conference.

6. **Systems-Based Practice:** Fellows will deal first-hand with patient concerns regarding costs of medications and health care in general. They will also advocate for quality patient care and work with multiple allied health professionals to facilitate prompt medical testing and procedures. They will also address cost-benefit concerns in patients who become candidates for heart transplantation.

Updated, 2013 EA
The Hillcrest cardiology service includes cardiology and vascular medicine inpatients on:
- The Cardiac Care Unit (CCU),
- The 10E telemetry unit, and
- Occasional patients on other units.

In addition, this team will be responsible for all in-house cardiology consults from other services. It is anticipated that this team will coordinate decisions regarding appropriate patient placement and transfers with the Cardiology Team at the Sulpizio Cardiovascular Center.

The CCU is located on 10 West. It is a combined unit with the Medical Intensive Care Unit (MICU), and together is termed the 10<sup>th</sup> floor Critical Care Unit. The Cardiology team takes care of all patients on the Cardiology services that are in the CCU. Non-CCU, “floor” Cardiology patients are typically placed on 10E, with occasional patients on IMU floors or the 11<sup>th</sup> floor which also has telemetry. The MICU is directed by Peter Fedullo, M.D.

The purpose of this orientation packet is to clarify the daily schedule and workings of the clinical cardiology service at Hillcrest.

**Nurse Manager:**
- CCU: Laura Wade, RN
- CCU Nurse Specialist: Patty Graham RN
- 10E: Ramona Lumbrersa, R.N.

**Case Manager:**
- Evelyn Temple
- Pager: 7932

**Unit Phone Numbers:**
- Tel 543-6592
- Fax 543-7149

**10E Phone Number:**
- Tel 543-6300

**Daily Schedule**

This rotation is designed to work seamlessly with the Sulpizio CVC Cardiology service. The team assigned to the Hillcrest Cardiology Service is comprised of:
- An inpatient/consult cardiology attending,
- A physician’s assistant, and
- One cardiology fellow (from 7AM-7PM). A second fellow covers from 7PM-7AM inhouse.
  - It is expected that at least one cardiology fellow be in house daily.
- On occasion a medical student or medical resident might also be on service as an elective.

**Workflow for this rotation is as follows:**

- Fellow #1: Inhouse 7AM-7PM (M-F)
- Fellow #2: Inhouse 7PM-7AM (M-F).
- Weekends (Saturday/Sunday)/Holidays: On Call Fellow 7AM-1PM in house, and home call from 1PM-9PM.
- Weekends (Saturday/Sunday)/Holidays: Moonlighting Fellow 9PM-7AM
- Daily didactic teaching will be following work rounds.
- The echo lab manager, Monet Strachan will provide a key to the echo lab.
- Fellows in Hillcrest do have access to a call room. Ask your chief fellow how to obtain access.

**Educational purpose and learning objectives:**

The educational purpose of this rotation is to give the fellow the experience and varied responsibilities of a practicing clinical cardiologist. Specific learning objectives include gaining expertise in the following areas:

13) consultative inpatient cardiology,
14) emergency room evaluation of patients with cardiac and vascular disease,
15) cardiac catheterization,
16) echocardiography, and
17) cost-effective management of hospitalized patients with cardiac disease.

**Teaching methods:**

These include teaching rounds with attending staff and direct faculty supervision of procedures such as cardiac catheterization, stress echocardiography and transesophageal echocardiography. The fellows will also attend regularly scheduled didactic sessions.

**Disease mix/patient characteristics:**

The patient population on this service is quite varied. Both male and female genders are well-represented. The majority of patients are >60 years of age, but there is a significant minority of younger patients with CAD, non-ischemic cardiomyopathy, endocarditis, and valvular heart disease. This is a busy emergency room where a high volume of acute cardiovascular disease patients and STEMI patients are evaluated.

**Type of clinical encounters/procedures/services:**

Admissions, ER evaluations, and cardiology consultations are generally seen first by the fellow or PA and then together with the faculty attending. Fellows are strongly encouraged to assist with cardiac catheterizations, transesophageal echos, elective cardioversions, and percutaneous coronary interventions. Fellows are expected to interpret echocardiograms while on the Hillcrest rotation. Faculty members will interpret echocardiograms each afternoon, and the fellow should participate whenever possible.

The fellows and PA will evaluate and admit patients to the cardiology service. Consultative cardiology services will be provided to other services by the same team. The team will preferentially transfer patients requiring cardiac procedures to the Sulpizio CVC. **For patient transfers an accepting attending physician (SCVC inpatient attending or catheterization lab attending) needs to be identified, case discussed with him/her or designee and documented in the medical record.** However, acute STEMIs or unstable cardiovascular patients will be managed and catheterized at the Hillcrest facility.

**Level of fellow supervision by faculty:**

Independent analysis of patient information by the fellow is encouraged, but all inpatients and consultations are seen by the faculty and reviewed with the fellow. All major clinical decisions are discussed by the fellow and faculty. **Cardiology fellows need to discuss any cardiology**
consult planned to be discharged directly from the Emergency Department with the attending physician. Faculty directly supervises transesophageal echocardiograms and procedures performed in the PACU or CCU. Daily rounds on the inpatient service and consultation service are performed by the attending physician, fellow and PA.

**Reading list:**

Braunwald's "Heart Disease"
Hurst's "The Heart"
Feigenbaum's "Echocardiography."

**Pathological material and other educational resources:**

Teaching files of interesting echocardiograms, angiograms, and stress tests are available on-line on the hospital's digital cardiac imaging system.

**Method of resident evaluation:**

ACGME core competencies are evaluated monthly by the attending faculty. These evaluations are discussed with the fellows and forwarded to the program director. First-year fellows are expected to have a mean evaluation score of 5 or greater on the standard 1-9 scale of the 6 ACGME core competencies. Second-year fellows are expected to have a mean score of 6 or above; third-year fellows are expected to have a mean score of 7 or above.

Expectations of fellow performance vary by year of training. First-year fellows are expected to be able to perform an adequate history and physical examination, and to understand the basic concepts of consultative cardiology, including (but not limited to) preoperative assessment and “cardiac clearance,” as well as evaluation for heart failure, coronary disease, arrhythmia, and valvular heart disease. First-year fellows are also expected to hone their skills in inpatient management of acute coronary syndromes, acute CHF, and valvular disease. They should perform right heart catheterizations independently and left heart catheterizations with attending input and supervision. Finally, fellows are expected to show empathy with patients and their families, and to communicate well with patients, their families, and ancillary staff.

Second-year fellows are expected to show continued clinical maturation: they should act with increased levels of independence in patient care activities, and should act as the leader of the inpatient service. They should also serve as primary operators for cardiac catheterization and TEE procedures, with less attending input. Third-year fellows should have mature clinical skills and instincts, and should perform consultations, catheterizations, and TEE with minimal attending supervision.

**Educational Purposes and ACGME Core Competencies**

Specific activities during this rotation that will enhance the fellows’ skills in the 6 core competencies include:

1, 2. Patient Care and Medical Knowledge: The fellow will encounter a large group of patients a wide variety of acute and chronic cardiovascular illnesses. The fellow will direct the care of these patients and assist in procedures performed. They will learn from the attending faculty during patient rounds and teaching rounds, and also from self-directed review of the literature.
3. Interpersonal and Communication Skills: The fellow will interact with medical staff, nurses, pharmacists, and other ancillary personnel. They will also communicate with patients’ families. There are no internal medicine residents working with the fellow during this rotation, so the fellow is the main contact person for family members, discharge planners, ancillary personnel, etc. The fellow is expected to keep accurate, timely-signed medical records.

4. Professionalism: The fellow will gain experience in the respectful treatment of all the above-mentioned groups, and will also maintain accurate procedure reports and logs.

5. Practice-Based Learning: The fellow is expected to gain knowledge from self-directed literature review. The fellow will also present cases from the Thornton hospital during weekly catheterization conference and discuss pertinent literature.

6. Systems-Based Practice: The fellow will work within a team of health care professionals and participate in inpatient management, facilitation of transfers, and discharge planning. The fellow will be exposed to patient concerns such as cost of medication, ambulatory follow-up, and end-of-life issues.

Updated, 5/17/2013 LC
Introduction

The Cardiovascular Catheterization Laboratory in the Sulpizio CVC is a second and third year fellow rotation. The fellow plays an integral role in the daily work of the laboratory and is also expected to make contributions to conferences and clinical research efforts.

Educational Purpose and Learning Objectives

The fellow is expected to obtain knowledge regarding the indications for the various procedures that are performed in the catheterization laboratory. These procedures include right and left catheterization, coronary angiography, ventriculography, aortography, peripheral angiography, right ventricular biopsy, evaluation of pulmonary hypertension, intraaortic balloon pump placement and pericardiocentesis. Interventional procedures include angioplasty with stenting, rotablator, cutting balloons, IVUS, fractional flow reserve, transseptal catheterization, valvuloplasty, TAVR, septal defect closures and peripheral vascular interventions. In addition to understanding the indications and the techniques, the fellow needs to become trained in the follow-up of these patients including recognition and treatment of the complications that arise from these procedures.

By the end of their training, fellows are expected to become competent in the performance of:
- Arterial and central venous sheath placement
- Right and left heart catheterization
- Diagnostic coronary angiography (including native coronary arteries, saphenous vein grafts, and internal mammary arteries)
- Left ventriculography
Aortography
Interpretation of coronary and peripheral angiography
Percutaneous closure of sheath insertion sites
Percutaneous right heart biopsy

Teaching methods

Fellows will be taught in didactic conferences and during cardiac catheterization conference, but also (and primarily) by direct supervision of the attending physician during cath lab procedure. Initially fellows will be expected to scrub in and observe procedures, then to participate actively in the procedures, and finally to act as primary operator. Catheterization films will be reviewed together with the attending physician prior to procedure report dictation.

Disease mix/patient characteristics

The majority of catheterization cases are performed in patients with coronary artery disease, though a significant fraction of cases are performed in patients with (1) nonischemic cardiomyopathy, (2) valvular heart disease, (3) peripheral arterial disease, and (4) cerebrovascular atherosclerosis. There are slightly more male patients than female.

Type of clinical encounters/procedures/services

Patients are generally first evaluated by the fellow in the Procedure and Treatment Unit (for outpatients) and in the hospital (for inpatients). The fellow is expected to perform a thorough evaluation and ensure the completion of the history/physical prior to the procedure. Following the catheterization, the fellow is expected to re-evaluate the patient for any postprocedural problems or complications.

Level of fellow supervision by faculty

The degree of fellow participation in the catheterization procedure is based on the fellow’s level of experience. During the first year of training, the fellow is not expected to be able to do an entire procedure by him or herself. By the end of the third year of training, however, the fellow should be able to perform a procedure with minimal input from the attending. This includes not only selecting and engaging the catheters, but selecting and planning the best angiographic views and selecting the optimal hemodynamic evaluation for patients with valvular heart disease.

Reading list

Braunwald: "Heart Disease,"
Hurst's "The Heart,"
Baim and Grossman: "Cardiac Catheterization, Angiography, and Intervention."

Pathological material and other educational resources

All catheterization images (including teaching studies) are digitally stored and available for fellow review.

Method of resident evaluation

ACGME core competencies are evaluated monthly by the attending faculty. These evaluations are discussed with the fellows and forwarded to the program director. Second-year fellows are
expected to have a mean score of 6 or above on the standard 1-9 scale of the 6 ACGME core competencies; third-year fellows are expected to have a mean score of 7 or above.

As mentioned above, expectations of third-year fellows are more rigorous than those of more junior fellows. To re-state, the degree of fellow participation in the catheterization procedure is based on the fellow’s level of experience. During the first year of training, the fellow is not expected to be able to do an entire case by him or herself: significant attending supervision and input will be required. By the end of the third year of training, however, the fellow should be able to perform a case with minimal input from the attending. This includes not only selecting and engaging the catheters, but selecting and planning the best angiographic views and selecting the optimal hemodynamic evaluation for patients with valvular heart disease.

**Educational Purposes and ACGME Core Competencies**

Specific activities during this rotation that will enhance the fellows’ skills in the 6 core competencies include:

1. **Patient Care:** During this rotation, the fellow will learn how to maximize patient comfort and stability during elective cardiac catheterization, but will also gain experience in the management of patients with acute coronary syndromes, acute MI, cardiogenic shock and peripheral vascular disease.

2. **Medical Knowledge:** The fellow will gain knowledge and first-hand experience in vascular access, right- and left-heart catheterization, coronary angiography, and vascular closure devices. Each case will be supervised (and later reviewed with the fellow) by a faculty attending. The fellow will also learn during catheterization conference, during review of teaching files, and during self-directed reading.

3. **Interpersonal and Communication Skills:** The fellow will interact with referring physicians, catheterization lab technologists, nurses, and administrative staff. They will be expected to maintain accurate, timely-signed medical records and procedure reports.

4. **Professionalism:** The fellow will gain experience in the respectful treatment of all the above-mentioned groups, and will also maintain accurate procedure logs and their hospital privileges.

5. **Practice-Based Learning:** The fellows are expected to gain knowledge from self-directed literature review regarding interesting cath lab cases they encounter, and facilitate the education of internal medicine residents rotating through the CCU service (as many patients on this service undergo cardiac catheterization). The fellow will also present cases during weekly catheterization conference and discuss pertinent literature.

6. **Systems-Based Practice:** The fellow will interact with various medical centers and systems while arranging transfers of patients for angiographic procedures. The fellow will also consider cost-effectiveness when deciding whether to recommend medical treatment, percutaneous coronary intervention, or coronary artery bypass surgery for patients with coronary artery disease.
Additional Cath Fellow Information and Responsibilities:

A. Pre-catheterization evaluation

Every patient undergoing a procedure in the Cardiac Catheterization Laboratory needs to be evaluated beforehand by the fellow. It is preferable, that the evaluation takes place in the evening before the procedure if the patient is an inpatient. However, many of our patients are outpatients and the evaluation has to take place the morning of the procedure. Pre-catheterization evaluation should begin with a review of the chart to know exactly what the consultant requests of the catheterization laboratory. All charts must contain a copy of the most recent history and physical or consultation describing the indication for catheterization, and a copy of the patient’s most recent cath report and cardiac surgery operation summary if either have been done previously. After reviewing the chart and obtaining a directed history, a brief examination is necessary to determine adequate vascular access and to examine the patient for the presence of cardiac abnormalities which would need evaluation during the procedure. Laboratory tests which should be noted and on the chart include electrolytes, BUN, creatinine, CBC, INR, PTT. Important ancillary tests such as the electrocardiogram, chest x-ray and echocardiogram should be reviewed.

Following the history, physical exam and reviewing the laboratory tests, it is essential to explain the goals and risks of the procedure, including the risks of anesthesia or moderate sedation, in detail with the patient and family before the procedure. Following this discussion, a consent form for the appropriate procedure should be signed.

Finally, it is essential to document in the chart the pre-cath evaluation, including history and physical, lab tests, and the informed consent process. There are certain special circumstances where cath attending or laboratory personnel must be notified ahead of time. They are as follows:

1. **Diabetes Mellitus**
   
   If the patient is an insulin-dependent diabetic, please notify the laboratory that the procedure will need to be performed in the morning as early as possible to prevent fasting hypoglycemia. In addition, the patient’s morning insulin regimen should be reduced by half to reduce the incidence of hypoglycemia.

2. **Chronic Renal Failure**
   
   If the patient has significant chronic renal failure, it is advisable to consult with a Nephrologist the day before the procedure so that they can follow the patient after the catheterization for the development of renal failure and the implementation of temporary dialysis if necessary. Further deterioration of preexisting renal dysfunction can be prevented by adequate pre-procedure hydration with saline, and administration of adjunctive pharmacotherapy. The cath lab protocol with respect to this needs to be followed.

3. **Contrast Allergy**
   
   In a patient with a previous allergy to contrast, it is necessary to document this on the chart. It is also important to document the type of reaction (either hives or anaphylaxis) and alert the attending before the case. In the situation of pre-existing allergy, both an antihistamine and a steroid should be given to the patient before the procedure. Although there are numerous regimens to prevent contrast-induced allergy, most people recommend Benadryl 50 mg on call to the cath lab along with oral prednisone 40 mg the night before and on call to the cath lab. Additionally, the use of an H2 blocker (such as Cimetidine 300 mg) on call is preferred.
4. **Previous Coronary Surgery**  
In the patient who has undergone previous coronary artery bypass grafting, it is essential to know exactly the number of grafts, what type of grafts were placed and where they were attached. These records are frequently not obtained by the housestaff, but it is incumbent upon the Cath Fellow to obtain these records prior to the catheterization to reduce the time spent searching for grafts and the amount of contrast given to the patient in these prolonged graft searches.

5. **Anticoagulant Therapy**  
If the patient is on Coumadin, it is necessary to document the prothrombin time before the procedure. Patient’s with an INR of greater than 1.8 generally should not undergo a femoral approach. If the patient is on intravenous heparin, it is generally appropriate to stop the heparin on call to the catheterization laboratory. However, if the patient has had truly unstable angina or recent acute infarction or has received thrombolytic therapy, the heparin should be continued up to the time of the procedure. Glycoprotein IIb/IIIa inhibitors can be continued throughout.

B. **Catheterization Procedure**  
The catheterization is performed to varying degrees based on the fellow’s experience by the fellow and attending. In the initial rotation, the fellow is not expected to be able to do an entire case by him or herself but by the end of the third year, the fellow should be able to perform a case with minimal input from the attending. This includes not only selecting and engaging the catheters, but selecting and planning the best angiographic views and selecting the optimal hemodynamic evaluation for patients with valvular heart disease.

In cases where two procedures are scheduled simultaneously, the fellow should scrub into the following types of cases:

1. Emergency diagnostic procedures
2. Routine diagnostic cardiac catheterization, whichever case is more complex or involves a more ill patient
3. Peripheral vascular diagnostic procedures
4. Cardiac biopsy
5. Right heart catheterization

C. **Post Catheterization Care**  
The fellow is responsible for care of the patient following the catheterization. Generally, that includes pulling the sheaths (although sheaths are almost always pulled in the cath lab) and following the patients until they are discharged from the hospital. **Electronic orders need to be placed in the chart immediately after case completion and prior to patient arrival in the PTU.** Patients should be evaluated for the development of complications of angiography, including acute stroke, renal failure, etc., as well as for the development of groin complications such as AV fistula or pseudoaneurysm and hematoma development. Any complications should be immediately reported to and discussed with the attending.

D. **Data Review**  
Each day, the fellow and attending should review each procedure that is performed and analyze the films and hemodynamics prior to the dictation of the catheterization report. It is the responsibility of the fellow to gather the data.
E. Dictation
Each procedure needs to be dictated the day that they are performed. Dictations of coronary angiograms should include detailed description of each coronary artery and the major branches. It is unacceptable to dictate “the coronary angiogram was normal”. For ventriculography, an estimate of LV ejection fraction should be made and wall motion described by segment. The referring physician should be dictated in all reports and a copy sent to them. Results need to be discussed with the referring physician by the attending or fellow at case completion.

F. Cath Conference
Catheterization Conference is held each Thursday at 4:30 pm. It is the responsibility of the Cath Fellow to organize the conference, including case selection and gathering of primary information for a complete case presentation. This includes being able to present a concise but complete history and physical exam, obtaining the chest x-ray for display, obtaining the electrocardiograms for display and obtaining the films for viewing. Additionally, hemodynamic tracings should be brought for display and discussion as well. The Cath Conference is mandatory for fellows on the catheterization rotation and cannot be missed without approval of the Cath Lab Director.

Updated, 2013 EM
CARDIAC ELECTROPHYSIOLOGY PROGRAM:
CARDIOVASCULAR MEDICINE FELLOW ROTATION

UCSD Medical Center/SCVC,
University of California, San Diego and
Veterans Administration Medical Center,
La Jolla, CA

1. Faculty Members and Staff:

Gregory K. Feld, M.D.  Professor of Medicine
                     Director, EP Program UCSD
                     Director, EP Fellowship Training UCSD

Sanjiv M. Narayan, M.D., Ph.D.  Professor of Medicine in Residence
                                 Director EP Program, VA Medical Center

Ulrika Birgersdotter-Green, M.D.  Clinical Professor of Medicine
                                 Clinical Electrophysiologist, UCSD
                                 Director, Pacemaker and ICD Clinic UCSD

David Krummen, MD  Associate Professor of Medicine
                    Clinical Electrophysiologist, VAMC
                    Clinical Electrophysiologist, UCSD

Vincent Chen, MD  Clinical Electrophysiologist UCSD
                   Research Fellow, Burnham Institute

Charles Tate, MD  Clinical Electrophysiologist UCSD

Jonathan Hsu, MD  Clinical Electrophysiologist UCSD

Ramesh Sivagnanam, MS  EP Program Manager

Joycelle Martinez, NP  EP Nurse Practitioner, UCSD

Vivika Wax, NP  EP Nurse Practitioner, UCSD

Stephanie Yoakum, NP  EP Nurse Practitioner, VAMC

Mary Parker, PA-C  EP Physicians’ Assistant, VAMC

Holly Sink, RN  EP Lab Nurse

Dawna Steltzner, RN  EP Lab Nurse

Claudia Stein, RN  EP Lab Nurse

Thomas Collins, RN  EP Lab Nurse
2. **Educational Purpose and Learning Objectives**

EP rotations account for a total of 2 months during fellowship. During these rotations, the Cardiovascular Disease fellow will (1) obtain experience and training in the diagnosis and management of bradyarrhythmias and tachyarrhythmias, (2) learn the indications and limitations of invasive and non-invasive electrophysiology tests, and (3) learn the fundamentals of pharmacologic and nonpharmacologic therapy, including antiarrhythmic drugs, device therapy and ablation. The trainee will be exposed to noninvasive and invasive techniques related to the diagnosis and management of patients with cardiac arrhythmias, including ambulatory ECG monitoring, event recorders, exercise testing, tilt table testing, invasive electrophysiology testing, and implantation of pacemakers and ICDs. The trainee will be taught ECG and intracardiac hallmarks of arrhythmias via formal ECG conferences, didactic lectures and conferences, and on the EP consultation service. During consultations, the trainee will gain first-hand experience in arrhythmias and their management in patients with (1) congenital heart disease, (2) acquired heart disease (3) recent surgery (cardiac and non-cardiac), and (4) recent cardiac transplantation.

An important component of training for the fellow is to learn the fundamentals of cardiac pacing, including recognition of normal and abnormal pacemaker function, indications for temporary and permanent pacing, pacing modes, and the general approach to programming and surveillance requirements for pacemakers and defibrillators. The trainee will receive formal instruction in insertion, management and follow-up of temporary pacemakers, including pacing and sensing threshold testing. The fellow will insert a minimum of 10 temporary pacemakers by the end of clinical training. The trainee will also be taught the indications and technique for elective and emergency cardioversion.
Advanced training for additional skills in Cardiac Electrophysiology, including permanent pacemaker implantation and management and assisting on electrophysiology studies and ablations, is available on special elective rotation.

3. Facilities and Resources Available to CCEP Program:

CCEP program facilities available at UCSD Medical Center and VA Medical Center for patient care, education and training, research, include a dedicated Electrophysiology Laboratory, CCU, ICU, Heart Station, Cardiac Catheterization Laboratory, Ambulatory Clinic, Pacemaker & ICD Clinic, Cardiac Surgery, Ancillary Personnel (e.g. secretary, nurses, technicians), Arrhythmia Research Laboratory.

4. Teaching Methods

These include (1) in-patient consultative teaching rounds with attending physicians, (2) out-patient clinic sessions with attending supervision, (3) didactic teaching sessions, (4) device interrogations and other non-invasive testing with attending supervision, and (5) electro-physiologic studies and ablations with attending supervision and instruction.

5. Disease Mix/Patient Characteristics

The disease variability is quite wide within the fellowship program, in part due to the various institutions included in the program (UCSD Medical Center, San Diego VA Medical Center and Thornton Hospital). The age range of treated patients is quite broad. Overall, the gender representation is approximately equal (though most patients at the VA Medical Center are male). The majority of patients tend to be middle-aged to elderly.

6. Fellowship Timetable During EP Rotation

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EP Studies at Thornton Hospital: Drs. Green, Feld, Tate, Hsu, Narayan, Krummen, Chen
EP Studies at VA Medical Center: Drs. Narayan, Krummen, Holland

7. Attending coverage of the EP Consult Service:

UH/SCVC – Green, Feld, Tate, Hsu
VA Medical Center – Narayan, Krummen

8. EP Attending Timetables

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<th>UCSD/SCVC Procedural Schedule. Please refer to online schedules for UCSD/VAMC</th>
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All Cardiovascular Disease residents rotating on the CCEP service are required to attend 2-3 half-day clinics per week. The Cardiovascular Disease resident will see several patients during each clinic with arrhythmias, pacemakers or defibrillators. After performing a history and physical exam, interpreting the ECG, and performing pacemaker or ICD interrogations (with assistance of the EP staff), the patient will be presented to the attending for determination of further treatment and follow-up.

9. Type of clinical encounters/procedures/services

All Cardiovascular Disease fellows rotating on the CCEP service are required to attend two UCSD clinics and 1-2 VA Medical Center clinic each week. The fellow will see several patients during each clinic with arrhythmias or implanted devices (Loop recorders, pacemakers or defibrillators). After performing a history and physical exam, interpreting the ECG, and performing any pacemaker or ICD interrogations (with assistance of the EP staff), the patient will be presented to the attending for determination of further treatment and follow-up.

All patients referred to the Clinical Cardiac Electrophysiology (CCEP) service for outpatient procedures (i.e. <24 hour stay), including diagnostic electrophysiology procedures, catheter ablation, pacemaker and ICD implantation, tilt tests, and cardioversions, may be admitted for observation to the CCEP service, where they will be evaluated and treated by the CCEP service fellow under the direct supervision of the CCEP faculty attending.

All patients admitted for inpatient treatment (i.e. >24 hours) are to be admitted to the Cardiology service, where the Internal Medicine residents and general cardiology fellow will provide continuous patient care under supervision of the admitting CCEP attending.

10. Night and Weekend Call:

The Cardiovascular Disease resident is not required to take night or weekend call, but attendance at weekend rounds on any patients that the fellow is taking care of is encouraged. This should be coordinated with the attending scheduled to be on call.

11. CCEP Conferences and Educational Resources:

The Cardiovascular Disease resident is required to attend the CCEP program clinical conferences. These will be held each Wednesday and Thursday at 8:00 AM. The conference locations will be circulated on a dedicated CCEP conference schedule and available from Pam Alford at the beginning of the academic year.

Each conference has a different focus. The Wednesday lecture is a Core Lecture from the curriculum (once per week), and Journal Club and Research Conference (once each per month).
The Core Lectures cover required didactic subjects and are presented by the CCEP faculty, with some topics presented by senior fellows. These lectures are comprehensive and current reviews of each assigned topic, and require textbook and current literature reading in preparation.

The weekly Thursday conference will take the form of a Clinical Case Conference. At Clinical Case Conference, several current cases will be discussed that represent common and straight-forward arrhythmias, or unusual and complex arrhythmias, and the salient points of each case will be discussed in detail by the CCEP faculty with the residents. The CCEP fellow is also responsible for selecting and presenting one or two articles at Journal Club each month, which will be presented and then discussed by the CCEP clinical team.

Clinical EP procedures are reviewed three days a week, usually after completion of all cases that day, by the CCEP attending with the CCEP resident for interpretation of tracings, findings, diagnosis and treatment plan. Cardiovascular Disease residents and students are encouraged to attend these study interpretation sessions.

In addition to these CCEP conferences the Cardiovascular Disease resident must continue to attend Cardiology Grand Rounds and Catheterization Conference held each week while on the CCEP service rotation. The Cardiovascular Disease resident should also attend the VA weekly ECG conference.

Cardiovascular Disease residents should collect a reading packet that includes seminal articles in electrophysiologic disorders and management. This packet is available in electronic (CD-ROM) or print form from Pam Alford or Dr. Narayan’s office (VA x3539).

12. Level of Fellow Supervision by Faculty:

The Cardiovascular Disease fellows are responsible for seeing and evaluating all new consultations to the CCEP service. The Cardiovascular Disease fellow will round on all in-patients by 8:30 AM. New patients will be seen and presented to the attending on EP Consult service the same day whenever possible, but certainly within 24 hours. Continuing care and communication with referring physicians is the responsibility of the Cardiovascular Disease fellow with the supervision of the CCEP attending on the consult service. Interrogation and programming of pacemakers and ICDs on inpatients may be performed by the Cardiovascular Disease fellow on the CCEP Consult service under supervision of a CCEP subspecialty fellow or attending.

When the Cardiovascular Disease fellow has completed his/her duties with respect to new consultations and inpatient follow-up, they should report to the Electrophysiology laboratory or clinic. During the diagnostic portion of any cardiac electrophysiology procedures, the Cardiovascular Disease fellow on service is to be present whenever possible and will be instructed in the techniques of venous access and electrophysiologic recording. This instruction may be provided in part by the CCEP subspecialty fellow, under the direct supervision of the CCEP attending. All other aspects of the EP procedure and/or pacemaker and ICD implantation are performed by the CCEP fellow under supervision of the CCEP attending. Following venous cannulation and catheter placement, the Cardiovascular Disease fellow will observe the EP procedure as it progresses with additional teaching provided by the CCEP attending (including relevant reviews and summaries of the findings, interpretation of tracings, diagnosis, and subsequent treatment plans). Subsequent interpretation of EP tracings may also be reviewed by the CCEP fellow with the Cardiovascular Disease fellow.

13. Reading List

Fogouros: “Introduction to Electrophysiologic testing”
Prystowski and Klein “Basics of Cardiac Electrophysiology”
Josephson’s “Cardiac Electrophysiology”, 3rd edition
UCSD CCEP Reading Packet on CD-ROM
General Cardiology texts, including:
Hurst’s “The Heart”
Braunwald’s “Heart Disease”

14. **Pathologic Material and other Educational Resources**

Teaching files and electrophysiologic tracings of interesting electrophysiologic studies and ECG case demonstrations are available on the hospital’s digital imaging system. Dr. Narayan and Feld have also made several teaching cases on print and digital format.

15. **Method of fellow evaluations**

The Cardiovascular Disease fellow must complete an evaluation of each attending and the CCEP rotation in general upon completion of their rotation on the CCEP Service. These forms will be forwarded to the fellow via e-mail from the cardiology fellowship director.

The Cardiovascular Disease fellow will be evaluated by the appropriate CCEP faculty member at the end of each rotation. ACGME core competencies will be evaluated monthly by the attending faculty. These evaluations will be discussed with the fellows and forwarded to the program director. First-year fellows are expected to have a mean score of 5 or above on the standard 1-9 scale of the 6 ACGME core competencies. Second-year fellows are expected to have a mean score of 6 or above on the standard 1-9 scale of the 6 ACGME core competencies; third-year fellows (when applicable) are expected to have a mean score of 7 or above.

Expectations of senior fellows are more rigorous than those of more junior fellows. During the first year of training, the fellow is expected to (1) perform a history, physical exam, and consultation with significant attending input and supervision; (2) understand the basic indications for electrophysiologic testing; (3) perform elective cardioversion with directed attending supervision; and (4) assist minimally during electrophysiologic testing procedures. At the end of the second year of fellowship training, the fellow is expected to (1) perform a history, physical exam, and consultation with minimal attending input and supervision; (2) interpret electrophysiologic recordings of common conduction system abnormalities (i.e., atrial fibrillation, SVT, VT, heart block); (3) perform elective cardioversion with minimal attending supervision; and (4) assist during electrophysiologic testing procedures and pacemaker insertions.

16. **Educational Purposes and ACGME Core Competencies**

Specific activities during this rotation that will enhance the fellows’ skills in the 6 core competencies include:

1. **Patient Care:** Fellows will see numerous patients on the inpatient EP consult service and in the outpatient clinics. They will also assist in electrophysiologic studies, ablation procedures, and pacemaker implantations, and will learn to maximize patient comfort during these procedures.

2. **Medical Knowledge:** The fellow will gain experience and knowledge in electrophysiology during the performance of EP studies, temporary and permanent pacemaker implantation, electrical cardioversion, and pacemaker interrogation; during ECG teaching rounds with attending faculty, during weekly EP teaching conference, during review of teaching files, and during self-directed reading and review.

3. **Interpersonal and Communication Skills:** The fellow will interact with attending physicians, electrophysiology sub-specialty fellows, EP technologists, and nursing staff. They will be expected to keep accurate, timely-signed medical records and procedure reports.
4. Professionalism: The fellow will gain experience in the respectful treatment of all the above-mentioned groups, and will also maintain accurate procedure logs and their hospital privileges.

5. Practice-Based Learning: The fellows expected to gain knowledge from self-directed literature review concerning interesting EP cases they encounter. The fellow may also present cases and discuss pertinent literature during EP conference, journal club, and weekly catheterization conference.

6. Systems-Based Practice: The fellow will interact with various medical centers and systems while arranging transfers of patients for electrophysiologic procedures. The fellow will also consider cost-effectiveness when deciding whether to recommend EP procedures and/or implanted devices (such as implantable cardiac defibrillators and bi-ventricular pacemakers) for patients with arrhythmias or heart failure.

17. Cardiovascular Disease Fellow Schedule

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<tr>
<td>AM</td>
<td>VA Device Clinic Area 2</td>
<td>SCVC Clinic or Case</td>
<td>SCVC Case</td>
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<td>SCVC Case</td>
<td>SCVC/VA Case</td>
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Updated, June 2013, GKF
UCSD Noninvasive Cardiovascular Imaging Laboratory
Fellow Orientation (FY 2013-2014)

Cardiac Non-Invasive Staff Personnel

Ajit Raisinghani, M.D. – Medical Director (pager 290-4307)
G. Monet Strachan, RDCS Manager and Technical Director
Mahtab Abbasi, RDCS
Baker, Keefe, RVT
Shamondah Block-Brooker
Kela Dashi, RDCS
Joseph De Los Reyes, RDCS
Teri Dittrich, RDCS
D. Stephanie Empivo
Liz Enriquez
Julie Filler, RDCS
Dhimmika Gamage, RDCS
Anthony Hadnot
Glenda Herrera, RN
Thao Q. Huynh-Covey, RDCS
Xi Lien, RVT
Karen McClure, RDCS
George Mesa, RDCS
Vince Miller, RDCS
Laura Mortensen, RDCS
Maria Orozco
Doreen Perez
Therese Romero, RDCS
Julia Schriber, RDCS
Kim Spencer, NP
Kelly Warrick

Sites

Hillcrest Heart Station Backline: (619) 543-6399 or (619) 543-6377
Fax (619) 543-2775
Hillcrest Echo Lab: (619) 543-5715
SCVC Non-invasive Backline: (858) 657-8111 or (858) 657-8118
Fax (858) 657-8996
SCVC Echo Lab: (858) 657-8905
SCVC Echo Reading Room: (858) 657-8183
Lewis St. Echo Room: (619) 471-9261
Encinitas Clinic: (760) 634-8273
Clinical Encounter/procedures/Services

Electrocardiography (ECG)
Exercise stress testing (Treadmill - ETT)
Holter and event monitoring

Echocardiography:  Transthoracic – 2D, 3D & 4D
                        Transesophageal (TEE) – 2D & live 3D
                        Contrast Echo
                        Resynchronization Echocardiography
Stress Echo:  Exercise echocardiography
                        Pharmacologic stress echocardiography (Dobutamine stress echo)

Introduction

Echocardiograms will be performed at 4 locations. We anticipate the bulk of the studies to be completed at the CVC, but the Noninvasive Lab at Hillcrest will also be fully functional. Additionally, outpatient studies will be performed at the Lewis Street clinic (Thursday, Friday), and the UCSD Encinitas Cardiology Clinic. Studies completed at Hillcrest and the CVC will be interpreted by the faculty at the CVC. Therefore, the assigned “reading” faculty member should be present at the Noninvasive Lab their entire reading session. The fellow will also be required to be physically present at the Noninvasive Lab all day (see exceptions below).

Echocardiograms will be performed on Saturdays at the CVC. These studies will be interpreted on the same day by the on-call Noninvasive faculty.

The echo fellow is also part of the cardiology consult service at SCVC/Thornton hospital. The level of involvement will depend on the number and presence of house staff. During the months when there are no residents on the consult service, urgent consultations will be seen by the fellow and staffed with the consult attending. However, consult service activity must not interfere with echo attending reading sessions or with TEE procedures. Urgent or “stat” consults during echo reading sessions should be triaged by the consult attending (or, if transfer to the cardiology service is likely, by the CVC team).

One sonographer is on call after-hours for both Hillcrest and the CVC (Echo sonographer night pager 619-290-8388). The sonographer can only be called in after contacting and obtaining approval from the on-call noninvasive faculty. The bulk of after-hour studies are focused examinations, and thus should be completed by the on-call fellow rather than the on-call sonographer.

Educational Goals and Learning Objectives

The purpose of this rotation is to provide the fellow training in interpreting and performing 2D Echo, TEE, ETT and stress echos with exercise and with Dobutamine.

By the end of the fellowship, each trainee should be proficient with performance and interpretation of transthoracic echocardiography, including M-mode, 2-D, pulsed and continuous wave Doppler, and color flow imaging. Our training goals are based on the Guidelines for Training in Adult Cardiovascular Medicine of the Core Cardiology Training Symposium (COCATS). During level 1 training, the fellow spends 3 months in the echo lab, performs 75 studies and interprets 150 supervised studies. To have sufficient training for independent echocardiographic interpretation, however, the fellow should perform and interpret at least
another 150 supervised studies (level 2). All fellows who wish to sit for the National Echo Board exam after fellowship must spend a total of 6 months in the noninvasive laboratory during their fellowship. Echo research and time spent during echo reading sessions will count toward this time.

During the Echo Lab rotation, the fellow also will be exposed to stress echocardiography and transesophageal echocardiography. To achieve competence in stress echo interpretation, trainees should have level 2 training (6 months) plus supervised interpretation of at least 50 stress echo studies. Similarly, competency in TEE requires level 2 training plus 75 supervised TEE procedures (which can include intra-operative studies).

Although all fellows should become familiar with stress and transesophageal echocardiography, we recognize that not all trainees will ultimately specialize in these areas. Therefore, TEE procedures may be performed preferentially by senior fellows interested in echocardiography (under attending supervision), although junior fellows may manipulate the TEE probe after diagnostic information is obtained. For each case, the attending will decide on the degree of fellow participation, based on patient stability and the urgency of the test. TEE must not be performed without faculty supervision. All fellows wishing to perform TEE should consider contacting the GI Suite for hands-on instruction in passing endoscopes.

For after-hours or weekend TEE or stat echo interpretations, an echo call schedule is available through the UCSD operator. If there are questions (or if an attending is unavailable), page Dr. Raisinghani (619 290-4307).

**Teaching Methods**

Hands-on teaching will be from the cardiac sonographers.

There are ample opportunities for the fellow to have hands-on experience performing echos in the Lab. These hands-on teaching will be directly supervised by a sonographer. The duration of each case may vary depending on the patient’s condition.

Due to the complexity of the procedure and the variety of equipment used in the Lab, the fellow is encouraged to practice with the transducer frequently. This will improve the hand-eye coordination and also improve his/her ability to perform a complete echocardiogram.

There are daily one-on-one echo interpretation sessions with the attending staff, which include interpretation of transthoracic echocardiograms and stress echo studies performed that day.

**Disease mix/Patient characteristics**

The patients referred for studies to the noninvasive lab include both in- and out-patients. Critically ill inpatients may require emergent procedures. Routine inpatients and scheduled outpatients are mostly stable. Both genders are represented approximately equally, and the age of patients varies widely. A large proportion of patients undergoing echocardiography have coronary artery disease, heart failure, and/or valvular heart disease.

**Type of clinical encounters/procedures/services**

The great majority of patients encountered by the fellow in this rotation will be referred to the Noninvasive Lab for noninvasive imaging, including transthoracic echocardiography, transesophageal echo, exercise ECG testing, exercise echocardiography, and Dobutamine stress
echocardiography. The fellow should be available to supervise all stress testing, and should evaluate all requests for TEE procedures. The fellow will obtain consent for TEEs, complete the H&P if needed, perform the procedures along with the attending physician and document the results.

**Level of fellow supervision by faculty**

Results of all echocardiographic and stress tests will be reviewed by the attending before a final report is prepared and approved. Fellows may supervise exercise and Dobutamine stress tests on their own, but all transesophageal echocardiograms must be performed under direct attending supervision. Fellows may perform transthoracic echocardiograms on their own or with sonographer supervision, but official reports can be generated only after an attending physician reviews and interprets the study. See below for expectations of fellow responsibility by level of training.

**Reading List and Educational Resources**

A partial list of currently available echo textbooks and review includes:

2. Feigenbaum H. Echocardiography.
5. Hagen A, DeMaria AN. Clinical Applications of Two-Dimensional Echocardiography and Cardiac Doppler.

**Pathological material and other educational resources**

A computer database of classic echo findings and interesting cases is available on the Lab’s digital system. Please ask the staff for assistance in viewing these.

The pathophysiology seen in the Lab will vary each month. Fellows are encouraged to read in order to fill out their knowledge base.

**Evaluation**

Each fellow will be evaluated monthly, with input from the attending staff and technical personnel. ACGME core competencies are evaluated monthly by the attending faculty. These evaluations are discussed with the fellows and forwarded to the program director. First-year fellows are expected to have a mean evaluation score of 5 or greater on the standard 1-9 scale of
the 6 ACGME core competencies. Second-year fellows are expected to have a mean score of 6 or above. Third-year fellows are expected to have a mean score of 7 or above.

Expectations of fellow performance vary by year of training. First-year fellows are expected to grasp basic cardiac anatomy and the basic physics of two-dimensional and Doppler echocardiography. They are expected to have personally performed 25 transthoracic echos (TTEs) and 10 transesophageal echos (TEEs), and to have interpreted 50 TTE studies. Second-year fellows are expected to be well-versed in cardiac anatomy and transthoracic echocardiography, and aware of more advanced concepts of transesophageal echocardiography. They should have personally performed 40 TTE studies and 25 TEE studies, and interpreted 75 TTE studies. Third-year fellows are expected to become fully competent in transthoracic and transesophageal echocardiography and to have performed >50 TTE studies and >40 TEE procedures. Fellows who specialize in echocardiography may perform additional TTE and TEE procedures during their final year of training.

**Educational Purposes and ACGME Core Competencies**

Specific activities during this rotation that will enhance the fellows’ skills in the 6 core competencies include:

1. Patient Care: This rotation does not include a large amount of direct patient care. The fellow will learn, however, how to maximize patient comfort during stress echocardiography and will gain experience in the technique of conscious sedation during transesophageal echocardiography.

2. Medical Knowledge: The fellow will gain experience and knowledge in echocardiography and cardiac imaging during the performance of transthoracic and transesophageal echocardiography, during daily teaching rounds with attending faculty, during review of teaching files, and during self-directed learning and reading.

3. Interpersonal and Communication Skills: The fellow will interact with cardiac sonographers, noninvasive staff personnel, and nurses. They will be expected to keep accurate, timely-signed medical records and procedure reports. They will also be expected to notify the attending and/or requesting physicians of any critical findings and document such notifications.

4. Professionalism: The fellow will gain experience in the respectful treatment of all the above-mentioned groups, and will also maintain accurate procedure logs and hospital privileges.

5. Practice-Based Learning: The fellow is expected to gain knowledge from self-directed literature and on-line review concerning interesting echo cases they encounter, and facilitate the education of internal medicine residents rotating on the Cardiology Consultation Service. The fellow may also present cases during journal club and weekly catheterization conference, and discuss pertinent literature.

6. Systems-Based Practice: There is not substantial activity in this Competency during the Echo Lab rotation.
Additional Information for Fellows on the Noninvasive Imaging Lab Rotation

Fellow Responsibilities

The fellow is an integral part of the Lab, and is essential to its efficient function. The fellow is expected to be in the Lab except during scheduled teaching and research conferences. Fellow responsibilities include:

1. Stand-by, monitoring, and discharge clearance for patients undergoing stress testing (including ETT, Stress Echo and Dobutamine Echo).

2. Occasional injection of agitated saline and/or echo contrast during TTE and Dobutamine echo studies. Pixus access grated at CVC

3. Assess patients for Stress Echos, and Dobutamine Echos.

4. Schedule TEEs with the attending cardiologists. Obtain consent and complete pre-procedure information, including H & P for TEEs.

5. Dictation of TEE procedures performed after review with the attending.

6. SCVC/Thornton consult service as described.

7. The attending reading schedule usually will be as listed,

   Monday: Raisinghani (619) 290-4307
   Tuesday: Blanchard (619) 290-8982
   Wednesday: Wilson (AM) (619) 290-7062
              McDavit (PM) (619) 290-9022
   Thursday: Cotter (AM) (619) 290-5654
             Knowlton (PM) (619) 290-5511
   Friday: DeMaria (619) 290-4915
   Saturday: On-call faculty

8. Alerting the ordering physician when striking abnormalities or critical findings (e.g., unsuspected vegetations, thrombi, severe new valve disease, tamponade, etc) are discovered. In addition, the ordering physician must be notified immediately of all abnormal stress test or Dobutamine echo results. Please document this communication in the final report.

9. The fellow will review and present an echo topic or journal paper on the fourth Thursday of the month during his/her rotation in the Non-invasive Lab.

Procedures, Protocols

Specific protocols for stress/Dobutamine echocardiography are available in the Lab, and fellows are encouraged to review these as well as echocardiography texts and articles. Conferences covering the specifics of stress echocardiography will be provided. Fellows should review stress echos before reading out with the attending.
Research Opportunities

Several projects are underway in the lab, and we strongly encourage fellow participation. Questions about research opportunities or projects can be discussed with the faculty.

This is a brief overview of the Noninvasive Lab rotation, and we welcome your comments and questions. We hope the rotation will be instructive and rewarding.

Updated, 2013 AR
SCVC/Thornton Consult Service Fellow Rotation

Educational purpose and learning objectives:
The educational purpose of this rotation is to give the fellow the experience and varied responsibilities of a practicing clinical cardiologist. Specific learning objectives include gaining expertise in the following areas:
- 18) consultative inpatient cardiology,
- 19) emergency room evaluation of patients with cardiac disease,
- 20) outpatient continuity clinic,
- 21) echocardiography, and
- 22) cost-effective management of hospitalized patients with cardiac disease.

Teaching methods:
These include daily clinical teaching rounds with attending staff and direct faculty supervision of any procedures. The fellow will attend daily echocardiography reading sessions at the CVC when possible, as well as regularly scheduled didactic sessions.

Disease mix/patient characteristics:
Part of the population seen at the CVC and Thornton hospital is similar to that of a community hospital, while other patients are referred for specialized care. Patients tend to be middle-aged to elderly, and genders are approximately equally represented.

Type of clinical encounters/procedures/services:
ER evaluations and inpatient cardiology consultations are generally seen first by the fellow and then together with the faculty attending. Fellows are strongly encouraged to assist with procedures such as DC cardioversions and transesophageal echocardiograms.
Fellows are expected to attend daily echocardiography teaching rounds at the CVC noninvasive lab when possible.

Level of fellow supervision by faculty:
Independent analysis of patient information by the fellow is encouraged, but all inpatients and consultations are seen by the faculty and reviewed with the fellow. All major clinical decisions are discussed by the fellow and faculty. Faculty directly supervise all invasive procedures.

Reading list:
Braunwald's "Heart Disease"
Hurst's "The Heart"
Feigenbaum's "Echocardiography."

Pathological material and other educational resources:
Teaching files of interesting echocardiograms, angiograms, and stress tests are available on-line on the CVC’s digital cardiac imaging system.

Method of resident evaluation:
ACGME core competencies are evaluated monthly by the attending faculty. These evaluations are discussed with the fellows and forwarded to the program director. First-year fellows are expected to have a mean evaluation score of 5 or greater on the standard 1-9
scale of the 6 ACGME core competencies. Second-year fellows are expected to have a mean score of 6 or above; third-year fellows are expected to have a mean score of 7 or above.

Expectations of fellow performance vary by year of training. First-year fellows are expected to be able to perform an adequate history and physical examination, and to understand the basic concepts of consultative cardiology, including (but not limited to) preoperative assessment and “cardiac clearance,” as well as evaluation for heart failure, coronary disease, arrhythmia, and valvular heart disease. Second-year fellows are expected to hone their skills in consultative management of acute coronary syndromes, acute CHF, and valvular disease. When necessary, they should perform right heart catheterizations with attending supervision. Third-year fellows are expected to show continued clinical maturation: they should act with increased levels of independence in patient care activities, and should act as the leader of the consult service. They should also serve as primary operators for invasive procedures with minimal attending input. Finally, all fellows are expected to show empathy with patients and their families, and to communicate well with patients, their families, and ancillary staff.

Educational Purposes and ACGME Core Competencies
Specific activities during this rotation that will enhance the fellows’ skills in the 6 core competencies include:

1, 2. Patient Care and Medical Knowledge: The fellow will encounter a large group of patients with a wide variety of acute and chronic cardiovascular illnesses. The fellow will round on the consult service daily and dictate/write notes to be cosigned by the attending. The fellow will learn from the attending faculty during patient rounds and teaching rounds, and also from self-directed review of the literature.

3. Interpersonal and Communication Skills: The fellow will interact with medical staff, nurses, pharmacists, and other ancillary personnel. They will also communicate with patients’ families. There are no internal medicine residents working with the fellow during this rotation, so the fellow is the main cardiovascular contact person for family members, ancillary personnel, etc. The fellow is expected to keep accurate, timely-signed medical records.

4. Professionalism: The fellow will gain experience in the respectful treatment of all the above-mentioned groups, and will also maintain accurate procedure reports and logs.

5. Practice-Based Learning: The fellow is expected to gain knowledge from self-directed literature review. The fellow will also present cases from the CVC and Thornton hospital during weekly catheterization conference and discuss pertinent literature.

6. Systems-Based Practice: The fellow will work within a team of health care professionals and participate in consultative management, facilitation of cardiac procedures, and discharge planning. The fellow will be exposed to patient concerns such as cost of medication, ambulatory follow-up, and end-of-life issues.
UCSD Nuclear Cardiology Rotation

Educational purpose and learning objectives

1. Clinical experience with nuclear cardiology imaging
2. For certain fellows interested in ASNC certification, additional training in physics, instrumentation, radiation safety, radiation biology are provided.

Teaching methods

1. Didactic lectures on physics, instrumentation, radiation safety, radiation biology.
2. Didactic lectures on Clinical applications in Cardiac SPECT and PET
3. Attending reading sessions with fellows

Disease mix/patient characteristics

1. Cardiac Perfusion Imaging: Patients with low to moderate likelihood for significant CAD
2. Cardiac Viability Imaging: End stage cardiomyopathy.

Type of clinical encounters/procedures/services:

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<th>Procedure</th>
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<tr>
<td>78428</td>
<td>Cardiac shunt detection</td>
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<tr>
<td>78459</td>
<td>Myocardial Imaging PET metabolic evaluation</td>
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<tr>
<td>78461</td>
<td>Myocardial perfusion imaging (planar)</td>
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<td>78452</td>
<td>Myocardial perfusion imaging SPECT</td>
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<tr>
<td>78466</td>
<td>Myocardial perfusion infarct avid imaging</td>
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<tr>
<td>78472</td>
<td>Cardiac blood pool imaging (MUGA)</td>
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<tr>
<td>78481</td>
<td>Cardiac blood pool imaging planar (first pass)</td>
</tr>
<tr>
<td>78491</td>
<td>Myocardial perfusion imaging PET</td>
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Level of fellow supervision by faculty

Cardiac stress test monitoring (treadmill and pharmacologic testing) is performed by the nuclear medicine faculty. The cardiology fellows assist on this procedure when available. The interpretation of the images are performed under direct supervision of a nuclear medicine attending.

Reading list

1. Diagnostic Nuclear Medicine, Sandler MP, Coleman RE, Wackers FJT, Patton JA, Gottschalk A, Hoffer PB. Williams & Wilkins, Baltimore MD.
   Section II, Chapters: 2-13, Physics and Instrumentation
   Section III, Chapters: 14-20, Radiopharmaceuticals, radiation protection, and dosimetry
   Section IV, Chapters: 21-29, Cardiovascular
Pathological material and other educational resources

Clinical Correlation: Cardiology catheterization conference

Method of resident evaluation

Attending evaluation forms
Written multiple choice physics examination.

First-year fellows are expected to understand the basic physics of nuclear imaging and assist in the interpretation of cardiac nuclear perfusion studies.

Second-year fellows are expected to understand the nuances of cardiac nuclear imaging and to act as primary interpreter of nuclear perfusion scans (under attending supervision).

Educational Purposes and ACGME Core Competencies

Specific activities during this rotation that will enhance the fellows’ skills in the 6 core competencies include:

1. Patient Care: This rotation does not include a large amount of direct patient care. The fellow will learn, however, how to maximize patient comfort during exercise and pharmacologic nuclear perfusion imaging.

2. Medical Knowledge: The fellow will gain experience and knowledge in nuclear cardiology during the performance of exercise and pharmacologic nuclear perfusion imaging, during daily teaching rounds with attending faculty, during review of teaching files, and during self-directed learning and reading.

3. Interpersonal and Communication Skills: The fellow will interact with nuclear medicine physicians, nuclear technologists, and nursing staff. They will be expected to keep accurate, timely-signed medical records and procedure reports.

4. Professionalism: The fellow will gain experience in the respectful treatment of all the above-mentioned groups, and will also maintain accurate procedure logs and hospital privileges.

5. Practice-Based Learning: The fellows expected to gain knowledge from self-directed literature and on-line review concerning interesting echo cases they encounter, and facilitate the education of internal medicine residents. The fellow may also present cases during journal club and weekly catheterization conference, and discuss pertinent literature.

6. Systems-Based Practice: There is not substantial activity in this Competency during the Nuclear Cardiology rotation. Fellows will, however, be exposed to issues of cost-effectiveness when deciding on the most appropriate noninvasive tests for patients with coronary artery disease.

Updated, 6/6/13 CH
Co-Director, Cardiac MRI and CT: Joel Wilson (Cardiology)
Co-Director, Cardiac MRI and CT: Sharon Brouha (Radiology)
Additional Faculty: Andrew Kahn

I. Cardiac MRI

A. Appropriate indications for cardiac MRI
   - Evaluate Viability
   - Define area of infarct including assessment of no-reflow
   - Stress testing for coronary artery disease
   - Suspected coronary anomalies
   - Congenital disease
   - Post-MI or CHF in patients with limited quality echos
   - Quantify LV function
   - Evaluate for specific cardiomyopathies (suspected amyloid, sarcoid, HCM, etc.)
   - Characterize native and prosthetic valves in patients with limited quality echos
   - Evaluate for ARVD
   - Suspected myocarditis
   - Cardiac mass/thrombus
   - Pericardial disease
   - Evaluation of suspected aortic dissection or thoracic aortic aneurysm
   - Myocardial iron assessment
   - Pulmonary vein anatomy

B. Ordering Information:
   For inpatients: place order in EPIC and page cardiologist/radiologist
   For outpatients: place order in EPIC, call/email with questions or special considerations.
   Patients with risk factors (age >60, diabetic, prior renal disease, etc.) for renal insufficiency need a recent (within 6 weeks) creatinine.
Pacemakers/ICDs are contra-indications.

C. Equipment:
   GE 1.5T magnet in Thornton
   GE 1.5T magnet in Hillcrest
   GE 3.0T magnet in Hillcrest

D. References:
   Society of Cardiovascular Magnetic Resonance web site: www.scmr.org
II. Cardiac CT

A. Appropriate indications for cardiac CT
   Coronary artery disease
   - Chest pain with intermediate pre-test probability
   - Chest pain with equivocal stress test
   - New onset CHF
   - Suspected coronary anomalies
   - Noninvasive coronary arterial imaging, including internal mammary artery prior to repeat cardiac surgical revascularization
   - Structure and function
   - Congenital disease
   - Cardiac mass evaluation
   - Pericardial disease
   - Pulmonary vein anatomy
   - Coronary vein mapping prior to placement of biventricular pacemaker
   - Evaluation of suspected aortic dissection or thoracic aortic aneurysm

B. Ordering information:
   For inpatients: place order in EPIC and page cardiologist/radiologist
   For outpatients: place order in EPIC, call/email with questions or special considerations.

   Patients with risk factors (age >60, diabetic, prior renal disease, etc.) for renal insufficiency need a recent (within 6 weeks) creatinine.

   For coronary artery CTA we would like patients to have heart rates less than 60 at the time of the scan.

   For inpatients: please give extra doses of beta-blockers the morning of the scan as needed unless contra-indicated.

   For outpatients: they will be given beta-blockers as needed at the time of their scan. Most patients should receive 50-100 mg of metoprolol PO approximately 1 hour before the appointment. While helpful, this step is not required. If beta-blockers and/or nitroglycerin are contra-indicated please note that when placing the order.

C. Equipment: 2 GE 64 slice GE scanners at SCVC/Thornton
   1 GE 64 slice GE scanner in Hillcrest
   1 Toshiba 320 slice scanner in Hillcrest
D. References:
Society of Cardiovascular Computed Tomography web site: www.scct.org


Cardiac CT Imaging: Diagnosis of Cardiovascular Disease, Matthew J. Budoff (Editor), Jerold S. Shinbane (Editor), Springer; 2nd ed. 2010.

Atlas of Cardiovascular Computed Tomography, Matthew J. Budoff (Editor), Jagat Narula (Editor), Stephan S. Achenbach (Editor), Springer; 2007.

III. Didactics

A. Monthly Cardiovascular Imaging Conference
Fellows are expected to contribute cases and participate in the monthly combined cardiology/radiology imaging conference.

B. Guided Study
Interested fellows can achieve level II training in cardiac CT (http://cccvi.org/cbcct/media/PDF/TaskForce13.pdf) and/or level I training in cardiac MRI (http://www.scmr.org/assets/files/TF12CMR.pdf).
Weekly schedule of cardiac CT/MRI studies is available via email (Thomas Daniell, tdaniell@ucsd.edu).

IV. Research Opportunities:
Contact A. Kahn, J. Wilson, and/or S. Brouha

Updated, 2013
Kaiser San Diego Medical Center
Cardiovascular Medicine Fellow Rotation
(Elective)

Educational purpose and learning objectives:
The educational purpose of this rotation is to give the fellow the experience and varied responsibilities of a practicing clinical cardiologist. Specific learning objectives include gaining expertise in the following areas:

- Echocardiography
  - ESE, DSE, TEE, TTE
- Cardiology graphics interpretation
  - ETT, ECG
- Inpatient invasive procedures
  - Transvenous pacemaker placement, right heart catheterization, pericardiocentesis, etc.
- Adult congenital heart disease
- Permanent Pacemaker placement
- Cardiac Nuclear medicine
- Inpatient cardiology consultation

Teaching methods:
These include teaching rounds with attending staff and direct faculty supervision of procedures such as transesophageal echocardiography, and pacemakers. The fellows will also attend regularly scheduled conferences.

Disease mix/patient characteristics:
The patient population at Kaiser Permanente is typical of a community hospital in Southern California, with a diverse representation of ethnicities, ages, and a fairly equal gender representation.

Type of clinical encounters/procedures/services:
Fellows are strongly encouraged to assist with transesophageal echos, elective cardioversions, right heart catheterizations, pacemaker placements, and other inpatient procedures.
Fellows are expected to interpret echocardiograms, stress echos, & graphics. Staff cardiologists will interpret echocardiograms each afternoon, and the fellow is expected to participate whenever possible.

Level of fellow supervision by faculty:
Independent analysis of patient information by the fellow is encouraged, but all inpatient consultations are seen by the attending and reviewed with the fellow. All major clinical decisions are discussed by the fellow and attending. Staff cardiologists will directly supervise all inpatient procedures.

Reading list:
Braunwald E. “Heart Disease”
Oh J. “The Echo Manual”
Pathological material and other educational resources:
Teaching files of interesting cases are available through the fellowship director & individual staff.

Method of resident evaluation:
ACGME core competencies are evaluated monthly by the attending faculty. These evaluations are discussed with the fellows and forwarded to the program director. First-year fellows are expected to have a mean evaluation score of 5 or greater on the standard 1-9 scale of the 6 ACGME core competencies. Second-year fellows are expected to have a mean score of 6 or above; third-year fellows are expected to have a mean score of 7 or above.

Expectations of fellow performance vary by year of training. First-year fellows are expected to perform an adequate history and physical examination, and to understand the basic concepts of consultative cardiology, including (but not limited to) preoperative assessment and “cardiac clearance,” as well as evaluation for heart failure, coronary disease, arrhythmia, and valvular heart disease. First-year fellows are also expected to hone their skills in inpatient management of acute coronary syndromes, acute CHF, and valvular disease. They should perform right heart catheterizations independently and left heart catheterizations with attending input and supervision. Finally, fellows are expected to show empathy with patients and their families, and to communicate well with patients, their families, and ancillary staff.

Second-year fellows are expected to show continued clinical maturation: they should act with increased levels of independence in patient care activities. They should also serve as primary operators for cardiac catheterization and TEE procedures, with attending input and guidance. Third-year fellows are expected to function basically as junior faculty (but with attending supervision). They should serve as primary operators for invasive and noninvasive procedures, with minimal attending input.

Educational Purposes and ACGME Core Competencies

Specific activities during this rotation that will enhance the fellows’ skills in the 6 core competencies include:

1, 2. Patient Care and Medical Knowledge: The fellow will encounter a large group of patients a wide variety of acute and chronic cardiovascular illnesses. The fellow will assist in all procedures performed. They will learn from the attending faculty during patient rounds and teaching rounds, and also from self-directed review of the literature.

3. Interpersonal and Communication Skills: The fellow will interact with medical staff, nurses, pharmacists, and other ancillary personnel. They will also communicate with patients’ families. The fellow is expected to keep accurate, timely-signed medical records.

4. Professionalism: The fellow will gain experience in the respectful treatment of all the above-mentioned groups, and will also maintain accurate procedure reports and logs.

5. Practice-Based Learning: The fellow is expected to gain knowledge from self-directed literature review. The fellow will also present cases during weekly catheterization conference and discuss pertinent literature.

6. Systems-Based Practice: The fellow will work within a team of health care professionals and participate in consultative inpatient management and facilitation of procedures. The fellow will be exposed to patient concerns such as conscious sedation during procedures, ambulatory follow-up, and satisfactory explanation of test results and their implications.
Cardiology at the VA San Diego Healthcare System

Welcome to Cardiology at the VA. This guide provides an overview of the following:

1. Responsibilities of Fellow on the VA Cardiology Service
2. Cardiac Catheterization and Electrophysiology Labs - Cardiology Fellowship Rotation
3. VA Cardiology Fellow’s Clinic
4. VA Computerized Patient Record System (CPRS)
5. Cardiology Protocols for Ordering Tests and Consults and Completing Results
6. Consults to Cardiology Services and Clinics

Responsibilities of Fellow on the VA Cardiology Service

I. Introduction – The Cardiology Fellow on the VA Cardiology rotation plays a crucial role in patient care and teaching in the CCU and Cardiology Consult services at the VA. The fellow is supervised by both CCU and Cardiology Consult attendings, and interacts daily with attendings and fellows in the Cardiac Catheterization/Interventional Laboratory and Electrophysiology Services. The Cardiology Fellow offices are located on 4 North near the Cardiac Catheterization Laboratory. The major responsibilities during this rotation are:

- Evaluate and manage patients admitted to the CCU-Cardiology service with the ICU housestaff and CCU attending until the patient is discharged.
- Manage inpatient Cardiology consults with the Cardiology Consult Attending and Cardiology Consult team (medical residents and students rotating on the VA Cardiology Consult service). MICU and SICU consults are staffed with the CCU Attending.
- Read all inpatient ECGs and review with the CCU Attending. Interpret Holter and Event monitor recordings and review with the EP attending.
- Evaluate patients for and perform transesophageal echocardiography (TEE) with the echocardiography attending. The fellow may perform emergency transthoracic echocardiography in the evenings and weekends, with sonographers available on call.
- Perform inpatient cardioversions with attending supervision.

II. Educational Goals – The goals of this rotation are to become thoroughly familiar with the management of critically ill and hospitalized patients and to serve as a subspecialty consultant. The Cardiology Fellow will manage patients with cardiovascular diseases including acute myocardial infarction, acute coronary syndrome (ACS), congestive heart failure, arrhythmias, valvular and pericardial diseases. The fellow will be trained to perform procedures, such as pulmonary arterial catheterization, placement of temporary pacemakers and transesophageal echocardiograms. The fellow will learn how to interpret the results from these procedures and tests including the ECG, echocardiogram, Holter and Event recorders, permanent pacemaker and defibrillator interrogation and the essentials of electrophysiologic testing.

Intensive Care Unit (ICU) – The ICU on 5 South is a combined coronary care (CCU), medical (MICU) and surgical (SICU) intensive care units. The CCU and
MICU services are combined, with care delivered by a single medical team of housestaff and students, supervised by two attendings: the Cardiology CCU Attending and Pulmonary Critical Care Attending (each with their own fellow). Each patient is designated for admission to either the CCU or MICU team. The Cardiology fellow is responsible 24/7 for both the patients admitted to the CCU and for consultation requests from ED or ward services. The fellow is expected to see all patients daily on both the CCU and consultative services. The consultative requests may be from SICU (presented to CCU attending), or medicine-surgical ward services (presented to consult attending). The IM resident team assigned to CCU will assist with unit evaluation/admissions for ED and medicine-surgical ward patients. If the VICU is at cap (16 patients for CCU and MICU combined), patients should be considered for transfer to an outside facility if indicated. The Cardiology fellow will be primarily responsible for all patients for whom consultation is requested for whom evaluation/admission to the CCU is not indicated.

A. CCU Admissions: Patients are admitted to the CCU service from the Emergency Department (ED) or Urgent Care Centers (UCC), hospital wards, Cardiac Catheterization Laboratory, Electrophysiology Service, or transferred from outside medical centers. The ED or ward will call the ICU resident for a “unit evaluation”. The ICU resident assesses whether the patient requires CCU level care, then calls the Cardiology Fellow to discuss whether or not to admit the patient to the CCU (or MICU). It is important for the Fellow to ensure that patients in the ED receive timely consultations and appropriate recommendations. If the ED or ward attending disagree with the recommendations of the MICU resident and/or CCU fellow, the fellow should discuss the case with the CCU attending in a timely manner before making a final decision on the disposition. Fellows should inform the CCU Attending of all admissions, particularly over the weekend.

1. Pathway for acute intervention in STEMI / new LBBB patients: If a patient has a ST segment elevation myocardial infarction, the Interventional Cardiology attending should be contacted as soon as possible to determine a plan of direct coronary intervention. After expediting confirmation of STEMI / new LBBB diagnostic criteria:

- Weekdays 7 a.m. – 3 p.m.: Call Cardiac Cath Lab immediately at x3464
- Off hours: Page Dr. Penny at 858-347-1678 or cell phone 858-395-8841 or the on-call interventionalist, based on the on-call schedule. Dr. Penny or the on-call interventionalist, will contact the nursing and technical staff support team.
- Notify the interventional cardiology fellow on call.
- Prepare patient for emergent cardiac catheterization, including administration of GP IIb/IIIa inhibitor (eptifibatide) if not contraindicated.
- The fellow is to remind the resident to follow the ACS algorithm and order set for patients admitted with ACS.
2. **Patient transfers:** VA patients in the CCU from outside hospitals or from other VA medical centers may be transferred to the CCU at the San Diego VA. The Cardiology Fellow, in conjunction with the CCU attending is involved in assessing the appropriateness of the transfer, deciding if the patient is stable enough for transfer, and determining if a bed is available. All transfers should be discussed with the CCU attending. Do not accept a patient for transfer without notifying the resident and the charge nurse.

B. **CCU Work-ups:** The Cardiology Fellow is required to write a note on all patients who have been admitted to the CCU. The CCU attending will write an admission note, which may be an addendum to the ICU Resident admission note. Cardiology fellow notes should document major decisions and treatment plans, even when deciding not to admit or transfer the patient to the CCU. It is not sufficient to have a resident’s note state “case discussed with fellow” without a separate note documenting the decisions by the Cardiology Fellow. Prior to discharge or transfer, it is helpful for the Cardiology Fellow to summarize the events in the CCU and document the plans to ensure appropriate follow-up and management discussed daily with the CCU Attending and team. Many patients are scheduled for post-discharge visits with the Cardiology fellow in the Fellows’ Tuesday afternoon clinic. The Fellows should be aware of how far out they are booked in their own Fellows’ clinics to make commitments for follow-up realistic.

C. **Morning Work Rounds:** CCU rounds occur Monday-Thursday, Saturday and Sunday from 7:30 – 9:00 a.m. On Fridays, CCU rounds are from 9:30 - 11:00 a.m. Cardiology didactic sessions occur on Tuesdays and Thursdays from 9:00-9:30 a.m.. The Pulmonary-Critical Care team make rounds from 9:30 – 11:00 a.m on all days except Fridays, when they round from 7:30 – 9:00 a.m. Work rounds primarily focus on management decisions. The housestaff must be allowed sufficient time to complete their notes, arrange transfers or discharges, and go home post-call. All rounds by the CCU and Pulmonary-Critical Care teams should end by 11:00 a.m.

Weekend coverage: Fellows cross-cover the VA and Sulpizio Cardiovascular Center (CVC) over the weekends, so should arrive promptly at 7:30 a.m. on Saturday and Sunday in order to become familiar with the patients and management plans. After the fellow completes VA CCU rounds, they will then go to the Sulpizio CVC for rounds. The Cardiology Fellow should always discuss any new admissions with the CCU Attending, as well as the status of each patient on the service. The CCU Attending should see all new patients within 24 hours after admission and have this documented in CPRS.

The combined census of the CCU and ICU patients should not exceed 16 patients. If this cap is approached, patients that no longer require ICU level of care should be transferred out of the ICU to the Medicine service. There should be a note by the Cardiology Fellow that provides guidelines for management. After transfer to the Medicine service, the Cardiology Fellow will serve as the consultant for these patients until discharge. In general,
these cases will be staffed with the CCU Attending.

D. CCU Teaching Rounds: Didactic teaching rounds are provided to the ICU team from 9:00-9:30 a.m. on Tuesdays and Thursdays. The Cardiology Fellow and/or Attending will lead talks on basic CCU medicine, as well as hands-on topics, including the management of patients with ACS, arrhythmias, heart failure, valvular heart disease, pulmonary artery catheterization procedures, interpretation of ECGs, etc.

E. Invasive Procedures – Indications should be discussed with the CCU attending. Informed consent must be obtained for all invasive procedures:

- **Pulmonary artery catheterizations** – The fellow should be involved in all decisions to place a pulmonary artery catheter in a CCU patient. A fellow or attending must be present for these procedures. Senior fellows or attendings are available to help place difficult lines. A procedure note must be written and should include initial calibrations and catheter tracing whenever possible.
- **Temporary pacemakers** – The need for a temporary pacemaker should be discussed with the CCU attending, and are placed by cardiology fellows or attendings.
- **Pericardiocentesis** – This may be performed by a cardiology fellow under the direct supervision of an attending.

IV. **Cardiology Consult responsibilities** – The Cardiology fellow address inpatient and outpatient consults. Formal (rather than curbside) consults are encouraged with all consults entered into paperless electronic chart (CPRS, Computerized Patient Record System). The Fellow must appropriately link their note with the consult in CPRS (instructions provided elsewhere in this packet) or the note will be “misfiled” and the consult considered unanswered.

A. Emergency and Urgent inpatient/Urgent Care Center consults: The Cardiology Fellow handles emergency or urgent consults 24/7 from the MICU, SICU, post-operative room, Urgent Care Center or DOU. The Cardiology fellow will be expected to respond to emergent consultation requests within 30 minutes (at a minimum, make telephone contact with the provider requesting the emergency consult); back-up by the Cardiology attending may be required if the fellow is unavailable within that time-frame. This may involve patients experiencing acute hemodynamic compromise, signs or symptoms of ischemia, serious bradycardias or tachyarrhythmias (including AF, SVT or VF/VF), or issues arising from their anti-arrhythmic medications. Cases from the MICU, SICU, and post cardiac surgery patients are presented to the CCU Attending. The others are presented to the Cardiology Consult Attending. Patients not planned for transfer to CCU will be seen primarily by the Cardiology fellow, not the IM resident assigned to the CCU.

B. Routine Inpatient Cardiology Consults: The Cardiology Fellow manages all inpatient consults and is responsible for reviewing their daily progress with the Cardiology Consult Attending. Routine, non-urgent consults can be assigned to the Medicine Residents or medical students on the Cardiology
Consult service for presentation to the Cardiology Consult Attending. When the resident is unavailable (e.g. at clinic or off post-call), or when there are no residents or students on the VA Cardiology Consult rotation, the Cardiology Fellow is responsible for completing the consult and presenting it to the Cardiology Consult Attending.

IV. **Call** – The Cardiology Fellow is on 24 hour call for the CCU from Monday 8:00 a.m. until Friday 5:00 p.m. The fellow will sign out to the fellow covering the CVC and VA for the weekend. The covering fellow is also responsible for 24/7 call. The fellow must respond within 30 minutes; if unavailable the assigned Cardiology attending will be expected to respond. Emergency consults during the evening and on weekends are expected to be handled by the Cardiology fellow. The IM resident assigned to the CCU will provide "rapid responses" unless the unit is very busy. If the unit busy, the fellow may need to come in to assist the IM resident in the CCU.

The Call schedule is listed in the VA Computerized Patient Record System (CPRS) under Tools > On-Call Schedules (SOCS) > Medical Service > Cardiology. This includes call schedules for attendings (A) and fellows (F) for the Cards VICU, STEMI/Cath Lab, Consult Service, Electrophysiology, and Echo Lab. If the fellow makes any changes in their schedule, they need to notify either Karren Strows (Supervisory Program Specialist), Patrick Holliday (Cardiology manager) or Scott Spitz (Supervisor, Cardiac Catheterization Laboratory) to make the appropriate change in SOCS, so that anyone needing to contact the Cardiology Fellow will know who is on call.

The Cardiology Fellow will receive sign out from the Physician Assistant (Jennifer Nowaczyk, PA-C) for routine cardiac catheterization and interventional patients admitted to the non-teaching service. The PA-C will write admission orders and discharge notes, with the Cardiology Fellow covering for any overnight events. The PA-C will sign out low level acuity post-EP procedures to the EP fellow. The ICU housestaff are not involved in the care of patient admitted to non-teaching services, including those by the Cardiology PA-C. If the Cardiology PA-C is out on leave, the H & P, orders, and discharges are the responsibility of the fellow.

VI. **Cardiac Ultrasound Laboratory** - The sonographers are available to help the fellows learn how to operate the echo equipment and digital echo system, and answer questions about the general performance of echoes. The sonographers do echocardiograms during the day and can perform those studies within minutes (for a truly STAT study) to hours, for less urgent studies. The Cardiology fellow may perform emergency echocardiograms after hours. The sonographers are on-call and can be contacted to come in during the night and weekends to perform studies when the fellow cannot obtain an adequate study, particularly if an important decision will be based on the echocardiogram. The call schedule for the sonographers are listed in SOCS under the Cardiology Echo Lab Calendar. Echo attendings are available at all times for assistance with the interpretations of transthoracic echoes or to perform transesophageal echocardiograms.

**A. Echo scheduling:** Fellows are asked to help the sonographer prioritize in-house emergency or stat echocardiograms and to evaluate patients when a
transesophageal echocardiogram is requested. Inpatient consults will be
given to the echo lab and scheduled as time slots become available, giving
priority to urgent cases first. Anyone requesting an emergent study should
speak directly with the cardiology fellow or sonographer in the lab or on call.

B. **Transesophageal Echocardiograms**: A transthoracic echo is usually
required prior to a TEE. Cardiology fellow and attending approval is
necessary. All TEEs are to be coordinated by the fellow together with the
sonographers and cath lab nursing staff. Exceptions would be TEEs requested
by the EP service to generally exclude LA appendage thrombus. Most TEEs
are performed in the cath lab holding area; rarely they will be performed in
the PACU. TEEs are considered invasive procedures. As such they require
notes equivalent to cath or EP procedures. These are:

- An H & P (must be within 30 days)
- A signed Informed Consent (dated within 60 days, verified at the time of
  procedure) – this showed be signed electronically by all involved in the
  consent using an "E-Pad"
- An Informed Consent Progress Note
- An Immediate Pre-procedure Note (unless H&P within 24 hours ) – stating
  that the procedure is “still indicated”, as the initial decision for the
  procedure may have been made days earlier and now the clinical situation
  may have changed. Note needs to include information on Mallampati
  Score (on ease of intubation), time of last meal, if the patient uses alcohol
  or tobacco, as conscious sedation will be used for the procedure.
- A Procedure note - ASAP after procedure. Fellows should enter a brief
  note in CPRS directly at the conclusion of the procedure (e.g. no
  intracardiac thrombus, no pericardial effusion, no evidence of valvular
  vegetation, etc.) to facilitate patient care. Within 24 hours of the
  procedure, enter the complete note in the Heartlab Digital Echo System.
  Training in use of the Heartlab system and its use for echo reporting can
  be obtained from the sonography or echo attending staff.
- Additional details about procedures in general that are appropriate for TEE
  are discussed in the Cardiac Catheterization section. In particular, the
  fellow will participate in the "**Time-out**" process, in which it is verified
  (with the patient, nurse, and physician) that the correct patient is present
  for the correct procedure.
- On arrival each month fellows should speak to the sonographers to obtain
  the schedule of TEEs planned already for that month and to obtain
  information on how to keep updated on this schedule.

C. **Contrast studies**: Fellows are occasionally asked to assist with echo
contrast and “bubble” studies. The lipid microspheres used for echo contrast
have had extremely rare deaths associated with their administration and:

- Are contraindicated in patients with known or suspected right-to-left, bi-
  directional, or transient right-to-left cardiac shunts, or hypersensitivity to
  perflutren
- Have relative increased risks of complications in patients with pulmonary
  hypertension or “unstable cardiopulmonary conditions” which necessitates
  a consent of the patient and then monitoring of vital signs, rhythm and
  oxygen saturation during and for at least 30 minutes after administration.
D. **Dobutamine echoes** are not currently performed at the VA, but only at UCSD. Please enter an external services consult for outpatients in order to obtain authorization. Once authorization is obtained, the patient will be sent a letter in the mail with detailed instructions and options in regards to scheduling this procedure.

VII. **ECG Reading** - The fellow interprets all **inpatient ECGs**, which need to be confirmed by the CCU Attending, and all **critical result ECGs**, which include ventricular tachycardia, complete or high grade AV block, ST segment elevation $\geq 1$ mm (unless RBBB or LBBB) or QTc $> 500$ ms, or $>550$ ms with LBBB. The fellow will review critical result ECGs and initiate appropriate action if needed (e.g. refer patient to be seen in the ED). The fellow will be text paged for critical result ECGs requiring more immediate attention while the Heart Station is open from Mon-Fri from 6 a.m. – 6 p.m., and Sat-Sun from 6 a.m. to 12 noon.

Most ECGs are read on the MUSE system. Inpatient ECGs and should be read promptly to allow timely corrections and entry into the patient record to facilitate patient care. The CCU attending will overread all ECGs read by the fellow. At the start of the rotation the Fellow should see Lea Echada in the Heart Station to receive privileges and orientation to reading computerized ECGs on the MUSE system. Outpatient ECGs are read by the Consult Attending and Consult team. All ECGs should be read daily and **must** be read by the end of the fellows’ rotation, or else the fellow will be asked to return afterwards to complete unread ECGs.

VIII. **Holter Monitor and 30-day Event Monitor Reading** - Preliminary Holter and Event Monitor reports will be entered into the electronic chart (CPRS) by the technician. Fellows review the preliminary report, make corrections, and designate the Electrophysiology attending as the cosigner for the report. If a life threatening arrhythmia is documented, contact the patient to advise him or her to present to Urgent Care, or if very ill to call 911. You should also inform his/her primary care provider and document these actions in your CPRS note.

IX. **Cardioversions** - Inpatient cardioversions are performed by the fellow with the CCU attending supervising. The fellow is responsible for evaluating the data (history, ECG, meds, and labs), ensuring that written consent has been obtained, be familiar with the proper use of the equipment, and determining that it is safe to proceed. It is the Fellow's responsibility to write pre/post procedure orders and enter a procedure note to close the consult with the CCU attending identified as a cosigner. Elective cardioversions are performed weekly. Patients are admitted to the PACU and evaluated by anesthesia. Many of these will be performed by the Electrophysiology NP. However, some may be performed by the Cardiology Fellow. Fellows may work closely with the Cardiology Nurse Case Manager and NP to help coordinate these procedures.
X. **Arrhythmia Clinics** - Fellows should try to attend the weekly Arrhythmia clinics that, together, provide broad experience in arrhythmia management and device interrogation and troubleshooting. The VA Arrhythmia Service runs 3 clinics: Cardiac Arrhythmia clinic (Thursday PM, Area 2), ICD clinic (Thursday PM, Area 2) and Pacemaker clinic (Monday AM, Area 2).

XI. **Miscellaneous** - The fellow will be asked to stand by and interpret exercise treadmill tests when the medical residents and Cardiology Nurse are unavailable. Cardiology Fellows may be involved in non-invasive electrophysiological procedures and tests. The VA Cardiology Fellow serves as the back-up for the VA Cardiac Cath Lab Fellow, and vice-versa. The fellow should assist the Cardiology Physician Assistant, who handles routine admissions and discharges from the Cardiac Catheterization and EP Laboratories.
Welcome to the Cardiac Catheterization Laboratories of the VA San Diego Health Care System. You can expect to perform ~50 diagnostic catheterizations, 2 endomyocardial biopsies, 4 electrophysiological studies, and 20 coronary interventional procedures during the month-long rotation. It is important to stop by the lab in the month prior to your rotation here. This will allow time for orientation by the current cath lab fellow, and for instruction in sterile technique and radiation safety by the cath lab staff and nurse. Please note the following responsibilities of the cath lab fellow:

1) Scheduling:
   Scheduled cases are listed in the Cath Lab Calendar kept by the Cath Lab Nurse (exts. 6728 and 2929). The cath lab and electrophysiology cases for the week are also posted on the board outside each respective lab. A data sheet should be filled out by the cath fellow or referring MD whenever a case is scheduled. This one-page note contains the patients’ hospital information, and should contain results of prior diagnostic procedures (e.g. ETT) and reason for referral. The cath fellow should be in contact with the Cardiology Consult team, CCU team, or Electrophysiology fellow at the beginning and end of each day (and as needed) to ensure that the schedule is adjusted to include all urgent in-house cases. **At the beginning of the month, be sure to inform the staff of the afternoons you will be unavailable due to scheduled fellows’ clinic at the VA or Hillcrest.**

2) Pre-Procedure Evaluation and Informed Consent:
   The cath fellow will see and examine all patients scheduled for cardiac cath procedures. Urgent cases are evaluated daily as inpatients. An outpatient clinic is scheduled three times a week in the afternoon following the day’s procedures to allow workup of 2-3 patients per session. A brief H & P is entered into CPRS (computerized patient record system – note linked to a consult if appropriate in order to "close out" the consult), including the indication for the procedure, any history of allergic reaction to iodine, pertinent physical findings including peripheral pulses and bruits, and relevant lab results (serum creatinine, Hct, platelet count, INR). All patients should have labs and ECG current within at most 30 days of the procedure (more recent as needed to address specific problems). The note should also state “The case has been reviewed by the attending (Dr. ___) who concurs with the plan.” and “The patient understands and wishes to proceed.” A plan for sedation, an ASA class and a Mallampati class should be documented.
   All CPRS notes must have the corresponding "Encounter Form" completed as well.
   The proposed procedure, its risks, benefits and alternatives should be explained in detail to the patient. Informed consent shall be obtained in writing in all patients at this time, and signed by the patient, the fellow, and a witness; date and time of consent should be recorded. All consents must be obtained electronically in writing using the iMed consent pad. The iMed consent process generates an "Informed Consent Progress Note" in CPRS which documents the following:
   a) The benefits and alternatives to the procedure have been discussed with the patient, as well as the potential risks.
b) The benefits and alternatives to anesthesia have been discussed with the
patient, as well as the potential risks (allergic reaction <0.5%, oversedation
1%).

Sedating premedications are no longer given prior to the patient's arrival in the
lab. The fellow should assess the need for sedation at that time, after verifying that all
necessary consent forms have been signed.

Premedication for patients **allergic to contrast**: prednisone 30mg q8h and
ranitidine 150mg BID started the afternoon or night before - the patient should receive
at least two doses (preferably three) prior to study. Cases (especially elective) in
patients with contrast allergy that have not received up-front premedication (over
hours) should be postponed.

In patients with abnormal renal function, administer mucromyst (acetylcysteine)
600mg (3cc) PO the evening before and morning of the procedure and be sure that the
patient is adequately hydrated (but not in CHF!) using IV NaHCO₃.

In patients with diabetes, metformin may be taken up to the time of the
procedure, but is then held for at least 48h afterwards and restarted after renal function
is verified. Hold AM regular insulin and give half of the NPH on the day of the procedure
- consider D5 1/2 NS hydration as needed. Hold oral hypoglycemics on AM of
procedure.

Keep all scheduled patients NPO p MN (including potential inpatient add-ons, but
reverse the order promptly once it is clear a procedure will not be performed that day).
Hold IV heparin on call to cath lab. Continue any GP2b3aI.

All cases must be discussed with the cath attending in the evening prior to the
procedure so that the order of cases can be established, the appropriate studies
included (right heart cath, exercise, etc.) and problems (e.g. vascular access) can be
identified.

A list of the order of cases with the patient's nameplate and hospital location
must be posted on the cath lab board with a "menu" the night prior to the procedures,
so the cath lab staff can prepare the appropriate equipment and send for the patients
promptly.

3) Pre-Procedures:
The fellow should be present in the cath lab area from the time the patient
arrives until his departure. All patients should be greeted by and examined by the fellow
who will perform the procedure prior to sterile draping. EVERY PATIENT MUST BE SEEN
AND EXAMINED BY THE FELLOW WHO WILL PERFORM THE PROCEDURE. The fellow
must participate in the "**Time-out**" process, in which it is verified (with the patient,
nurse, and physician) that the correct patient is present for the correct procedure, to be
performed from the correct access site. This is documented in the Nursing note. A brief
"**Immediate Pre-procedure Note**" must be entered into CPRS on the day of the
procedure, briefly summarizing the indication for the procedure, any pertinent findings,
and documenting any changes occurring in the interim since the patient was last
evaluated for the procedure. This pre-procedure assessment note is generated via the
CART-CL VA database program, which is found in the Tools menu of the hospital
computer system (CPRS). This note should be completed and signed by the fellow,
pasted in to CPRS, and the co-signed by the cath attending.

4) Procedure:
Cases should start at 8:00 AM except when scheduled conferences conflict. The
last case should start by 1:30 PM, as the technical staff shift ends at 3:30 PM. All
procedures are performed by an attending cardiologist and a cardiology fellow. The fellow will be trained to establish vascular access from the femoral vein and artery under local lidocaine anesthesia, to perform right heart catheterization from the femoral approach, to properly pass and flush wire-guided catheters, wire-guided catheters, to safely inject the coronary ostia with contrast and to perform left ventriculography and selected coronary interventions. Fellows may also scrub in a selected number of electrophysiology cases throughout the month, including EP study ablation, AICD and pacemaker (incl. biventricular) placements.

After the procedure, the fellow should assist in transferring the patient from the cath table to the gurney. All vascular sheaths will be removed by the fellow who placed them. Following diagnostic procedures, sheaths are removed promptly and femoral pressure is applied for twenty minutes to achieve hemostasis, unless a closure device is used. The fellow shall complete and enter in the computer the post-procedure orders for patient and cath site assessment, fluids medications, and activity. Patients should routinely be hydrated following contrast procedures (e.g., 1/2 NS @ 150cc/hr x 1L), with careful monitoring and diuresis as needed. The preliminary note describing the pertinent findings should be completed by the attending. Be sure to contact and inform the receiving resident if the patient is to be newly admitted from the cath lab (e.g., an outpatient who underwent PCI, high risk anatomy awaiting CABG, etc.).

5) Cath Reports:

The **Procedure Report** consists of: a) A brief “Cardiac Catheterization Procedure” note describing the general findings of the case. This note should be identified as being preliminary (that a full note will follow) and signed by the fellow so that it can be viewed promptly by the staff managing the patient. b) The formal note will be entered using the CART-CL VA database program, which is found in the Tools menu of the hospital computer system (CPRS). This report will be completed after the hemodynamic data and angiogram are reviewed with the attending physician and recommendations for future management are established. This note will be finalized in CART-CL by the attending and pasted as an addendum to the CPRS procedure note described above. Reports must be completed before the fellow leaves the hospital on the day of the procedure.

6) Post-Procedure Checks

All patients are re-examined in the afternoon following the procedure and inpatients are examined again the following morning. The Physician Assistant in Cardiology will assist in admission and documentation for outpatients who are admitted to the hospital after uncomplicated PCI. The general status of the patient, intake and output, and groin hemostasis should be assessed along with laboratory and ECG data. The patient should be informed as to the results of the study, and the recommendations for future care discussed and documented clearly in the chart. The housestaff and/or PA should be personally contacted for discussion of the recommendations for management and of discharge plans and follow-up. Patients hospitalized overnight following successful PCI should be "fast-tracked," with prompt AM discharge if no untoward events are noted.

7) Electrophysiology Procedures

Cardiology fellows are encouraged to scrub and assist on electrophysiology procedures. These procedures include diagnostic electrophysiology studies and ablations, implantation of implantable loop recorders, permanent pacemakers,
implantable defibrillator and biventricular devices and tilt table tests. In general, either the Cardiology fellow or a Cardiac Electrophysiology fellow will assist.

**Inpatients:** The assisting fellow should evaluate all inpatients before their procedure, write a brief H&P, obtain informed consent and write pre-operative orders. The fellow should then communicate with the Electrophysiology/Catheterization Laboratory staff to facilitate scheduling and discuss patient care issues such as iodine allergy or the need for anesthesiology coverage (for unstable patients).

**Outpatients:** All patients scheduled this way will already have been evaluated by the EP service.

**Procedure:** The assisting fellow will learn all aspects of the electrophysiologic study or device implantation. This will commence with the placement of external defibrillator paddles, patient prep-zones and surgical draping and extend to catheter or lead positioning and electrogram interpretation. The fellow will then ensure that post-procedure orders are written and communicated to the admitting housestaff (when applicable) and that the patient is checked the following day. For device patients, the post-operative day 1 check includes a wound and chest X-ray check, and an interpretation of the device interrogation (performed by the company representative or EP staff). For patients undergoing EPS or ablation, the check will be similar to that for patients undergoing angiographic studies (see above).

**Overnight coverage** for VA patients undergoing EP procedures will be provided as follows: Patients having undergone higher-risk procedures, including VT ablation or trans-septal cannulation, will be admitted typically to the Direct Observation Unit under the teaching service overnight. Other patients, who are deemed to be low acuity, will be covered by the EP fellow on-call. Jennifer Nowaczyk, PA-C, will sign out all such patients to the EP fellow at the close of each business day. Overnight issues on DOU/ICU patients will therefore be covered by the teaching service, with backup from the EP fellow/attending. Overnight issues on other EP patients will be handled directly by the EP fellow/attending on call.

8) Cardiovascular Cath Conference
Cardiovascular Cath conference is held every Thursday from 4:30-6:00PM on the East Campus Office Building (ECOB), 3rd floor. The cath fellow must prepare one or two cases each week for discussion, and present each case to the Division in a manner which reflects his or her insight and understanding of the field of invasive cardiology.

9) Summary of Documentation
Remember, each patient undergoing a cath/EP procedure needs:
- An H&P (must be within 60 days)
- A signed Informed Consent (dated within 60 days, verified at time of procedure)
- An Informed Consent Progress Note
- An Immediate Pre-Procedure Note (use the CART-CL assessment form)
- A Procedure note (ASAP after procedure, in CART-CL/CPRS)
- And a Post-Procedure Check note.

All patient contact notes must be accompanied by the appropriate Encounter form in CPRS!
**VA Cardiology Fellow’s Clinic**

All Cardiology Fellows have a continuity clinic at the VA on Tuesdays (1-4 p.m., 3 West Access Area) every other week, alternating with a Wednesday afternoon clinic at UCSD (see attached annual schedule). The attendings for the VA clinic are Drs. Denise Barnard and Alan Maisel, who concurrently hold their own clinic in the same area, or the Cardiology Consult Attending.

Fellows see new and continuity patients at each clinic session. Every patient who is new to the facility must be seen by or discussed with an attending. This can be documented by an independent attending note, an attending addendum to the fellow’s note, and/or by a description of attending involvement in the fellow’s note. Patients who are seen on return visits should be seen by or discussed with an attending at a frequency to ensure effective and appropriate treatment.

Fellows are assigned patients to follow throughout their three year fellowship. This may include new patients referred to Cardiology for a consult, patients discharged from the hospital, and patients who underwent procedures. New patients may be seen only once (e.g. as a post-PCI follow-up). If the patient’s cardiovascular disease is relatively stable, they should be discharged from this clinic and followed by their Primary Care provider and referred back to Cardiology as needed. This frees up the number of openings to see new patients. As a rough guide, fellows are allotted one hour for new patients, and are scheduled to see returning patient every half hour.

**Clinics may not be cancelled without a 60 day notice.** The Cardiology secretary must be notified at least 60 days in advance. The secretary will forward the request to the VA Chief of Cardiology for approval. The 60 day advance notice is a **VA Medical Center policy.**
VA Computerized Patient Record System (CPRS)

The VA Health Care System utilizes a Computerized Patient Record System (CPRS) to place orders, prescriptions, enter notes, and request consults. This packet will orientate you on how to access the various departmental requirements in Cardiology. Phone extensions and contact personnel for the individual departments are attached.

There are several processes to record notes and result on pending consults. When entering a note on a patient, it is always required to link it to the appropriate consult for specialized services and/or procedures. Although it may state it is a consult to Cardiology, there are several departments within Cardiology (e.g. Inpatient, Outpatient, Arrhythmia, Pacemaker, ETT, ECG, EP, Echo, Cardioversion, Holter & Event Monitors). It is important to link your note to the correct Service's consult, to ensure that the consult is properly resulted on (completed/closed/action taken), and the requesting physician is notified that the patient has been seen. Otherwise the consult will be left open (e.g. pending or scheduled), with no apparent action.

The following are VA protocols and instructions on entering patient notes and Consult resulting. **An attending physician is required to co-sign all notes.**

A. Completing Consults
Completing consults may be performed in either CONSULTS or NOTES tab in CPRS.

<table>
<thead>
<tr>
<th>CONSULTS TAB</th>
<th>NOTES TAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select Patient</td>
<td>Select Patient</td>
</tr>
<tr>
<td>Click CONSULTS tab</td>
<td>Click NOTES tab</td>
</tr>
<tr>
<td>Highlight the consult you want to complete</td>
<td>Click New Note</td>
</tr>
<tr>
<td>Click ACTION menu – Select CONSULT RESULTS</td>
<td>Select Progress note title with Med/Card CONSULT</td>
</tr>
<tr>
<td>Select Complete Update Results</td>
<td>Select consult Request (OK)</td>
</tr>
<tr>
<td>Select Clinic Visit (OK)</td>
<td>Enter the results *</td>
</tr>
<tr>
<td>Select Progress Note with Med/Card CONSULT</td>
<td>Sign Note to complete</td>
</tr>
<tr>
<td>Enter the results</td>
<td></td>
</tr>
<tr>
<td>Sign Note to complete</td>
<td></td>
</tr>
</tbody>
</table>

* Can select a personal template at this point
These procedures will close out the consult and send a View Alert to the requesting clinician. The note can be viewed in either the Consults or Notes tab.

B. Consult Actions:

**RECEIVE:** This only changes the status from "PENDING" to "ACTIVE". A consult service doesn't need to do this, because it still needs definitive action (with Complete, Cancel or Discontinue) to remove it from the "pending" list.

**SCHEDULE:** This can be used by a Service/Specialty to annotate a consult that an appointment has been scheduled for the patient. (It does not schedule an appointment, appointments must be made through Scheduling package)
**CANCEL/DENY:** Use this if this is a duplicate consult, or if the patient isn't eligible for services. When you choose this, you will be prompted to enter a comment along with it (gets you into the Screen Editor).

**DISCONTINUE:** Use this action if the patient was not seen (e.g. patient was transferred before being seen, patient's status deteriorated to where the consult is no longer valid, etc). This action also gives you a chance to make a comment.

**COMPLETE:** This is the main consult action used for the report once the patient has been seen. When you select this, you will be prompted for a consult title. When a consult is complete, an alert is sent to the requesting provider.

**NOTE:** Only the actions of COMPLETE, DENY, or DISCONTINUE definitively take care of the consult and remove it from the pending list.

**FORWARD:** Use this action if the consult needs to move somewhere else (e.g. the consult was sent in error and belonged in Pulmonary or Physical Therapy, or was received in Medicine-Inpt. and should go to Medicine-Outpt). This moves it to another area but does move it off your pending list. You are given a chance to comment here when forwarding. Forwarding is also used to move a consult to other receiving areas within a service.

**ADD COMMENT:** This just adds information to the consult, but it is not for the report. An example of when you might use this is to let the clinician know the patient is scheduled to be seen. This action doesn't remove it from your pending list. A comment can be added after the consult has been completed.

C. **Status Levels For Consults**

- **ACTIVE** Orders that are active or have been accepted by the service
- **COMPLETE** Orders that require no further action by the consult service
- **DISCONTINUE** Orders stopped prior to expiration or completion.
- **PENDING** Orders placed but not yet accepted by the requested service
- **PARTIAL RESULTS** All or part of a consult completion report has been entered, but has not yet been signed.
- **SCHEDULE** Receiving clinic has scheduled an appointment for the patient
- **CANCELLED** Orders rejected by the ancillary service without being acted upon. (Taking the action of DENY changes the consult status to Cancelled)
D. Creating In-Patient Consult Cardiology Notes in CPRS

On notes page, select “File/Update Provider/Location”

Select provider and clinic appointment from list
Select "Action/New Progress Note"

For Cardiology Title
Choose:
LJ Med Cardio Inpatient

Select Progress Note title from list

Note location has changed to appointment

You should now be able to type your progress note and enter encounter form information when completed.
**CARDIOLOGY PROTOCOLS FOR ORDERING TESTS AND CONSULTS AND COMPLETING RESULTS**

A. **Consult Ordering Instructions:**
1. Click on New Consult button in the middle of the left side of the CPRS screen. The Consult Order Dialog will open.
2. Identify the Service/Specialty to provide the consult. Click on the Service/Specialty tree menu button at the end of the text box.
3. Click on the plus sign next to the desired Service to reveal the consults provided by that service (i.e. Medicine → Cardiology).
4. Identify and select the consult type and location by clicking on the appropriate consult specialty. This will insert the correct consult in the Consult to Service/Specialty box.
5. After selecting the Consult Specialty the next drop down menu box identifies the Urgency of the consult. Select the urgency.
6. Select Location. There are two choices in which the patient can be seen: Inpatient or Outpatient.
7. Select Place of consultation. Choices will be based on Inpatient or Outpatient.
8. A box requiring the patient’s provisional diagnosis will come up. A Provisional Diagnosis is a required field and limited to a range of specific diagnosis. Click the Lexicon button to add the provisional diagnosis. Enter text or ICD-9 code in the box, click the Search button. Then select the correct diagnosis.
9. Enter a reason for the request. In some cases there may be preformatted text in the text area which should be completed.
10. The consult is now complete. Click the Accept Order button on the bottom right side of the Order Consult window. After clicking the Accept Order button, the text in Reason for Request will disappear. Click the Quit button if you are done requesting consults.
11. Sign the consult to release it.

B. **Echo, ECGs and Holter Monitors/Event Monitors Ordering Instructions:**
These tests are ordered in CPRS via Clinical Procedures:
1. Select patient
2. Click on the “Orders” tab.
3. Under the “Write Orders” column to the left of the screen, scroll all the way down. Under “Medicine,” select “Cardiology.” Enter Encounter Provider name and Visit Location (clinic where the patient is currently being seen and exam is being ordered from).
4. Click “OK.”
5. Cardiology Menu will come up.
7. Select from the list of Echo options, ECG options or select Holter Event Monitor. For echoes, the consult types available are: Cardiac Echo – Inpatient, Cardiac Echo – Outpatient or Cardiac Transesophageal (TEE) Echo.
8. Indicate the date and time needed, provisional diagnosis, and reason for request.
9. Accept order.
10. Click “Done.”
11. Sign order. Request will then be transmitted to Cardiology.

C. **Echo Reports, ECG results and Holter Monitor reports** available in CPRS:
   1. Inpatient Echoes will have preliminary reports (interpreted by sonographer only) as a NOTE in CPRS. TEEs will have a preliminary note from the fellow.
   2. Final Echo reports (both inpatient and outpatient), ECG and Holter Monitor reports are found as PDF image documents in the “Vista Imaging” portion of CPRS. To find these reports, use the following procedure:
      i. In CPRS choose menu Tools » Vista Imaging »
      ii. sign on (or this can be automatically set up by the IT department)
      iii. go to either image list or abstracts and choose the procedure (and appropriate date)
      iv. Highlight and double click on specific report date desired.
   3. Echo reports older than Dec 2007 are listed as a NOTE in CPRS directly.

D. **Event-Monitor Reports** are faxed to Cardiology (858) 642-1199 from Life Watch, Inc., a copy of the original consult is attached to the report and is put into a special box on the fellows’ desk. Abnormal reports, or those that fall into the Physician’s notification criteria are followed by a phone call to the ECG-lab staff during the hours of 6:30 AM to 4:00 PM Monday-Friday, who then contact the fellow on duty. After hours, holidays, and weekends abnormal reports are faxed and telephoned to the afterhours contact person listed on the original Event-Monitor consult request. If the person requesting the event-monitor is a Cardiology Staff attending, abnormal reports (after hours, during weekends, and holidays) are faxed to the Cardiology Fellow on duty followed by a phone call from Life Watch.

E. **ETT (Exercise Treadmill Test)** can be ordered in CPRS for patients with good exercise capacity and normal ECGs. The consult types available are: Exercise Treadmill Test or Exercise Treadmill Test-Sestamibi (ETT-MIBI). **ETT Reports** are available in CPRS under the consults tab.

ETT-Sestamibi: Should be ordered for patients with good exercise capacity, but abnormal baseline ECG (bundle branch blocks, abnormal ST-T segments, digoxin ECG changes). A consult for an ETT-Sestamibi plus a Nuclear Medicine Cardiac Perfusion Test must be entered (two consults are needed because one goes to Cardiology and the second to Nuclear Medicine – an unresolved CPRS conflict).

Adenosine-Sestamibi: Should be ordered for patients who do not have a good exercise capacity.
Consults to Cardiology Services and Clinics

A. Cardiac Catheterization - Pre-Cardiac Cath Clinic
Cardiac Catheterization evaluations can be ordered in CPRS by selecting Cardiac Cath consult. Appointments to the pre-cath clinic are obtained by referral from the Cardiology Consult Service, Stress Test Laboratory, Inpatient Cardiology consults.

Cardiac Cath Reports: In CPRS, Cardiac Cath reports are available under the Notes tab (Cardiac Catheterization).

B. Electrophysiology Study, Ablation or Device Implantation
Evaluation for these procedures can be requested in CPRS by selecting a Cardio-Arrhythmia consult. Typically, this follows evaluation in Cardiology New Patient Clinic or an Inpatient Consult.


C. Arrhythmia Clinics are held in Area 2 on the 1st floor every Monday from 09:00 AM to 12:00 PM and every Thursday from 1:00 PM – 4:00 PM.
   • Appointments are obtained by submitting consult to Card-Arrhythmia.
   • After discussion with the Electrophysiology Fellow or attending staff, requests to evaluate patients for the following procedures may be requested:
     1. Implantation of Pacemaker or ICD;
     2. Electrophysiology Testing (EP) for diagnosis or ablation of a documented tachycardia
   • Inquiries can be made by contacting Donna Cooper, Case Manager at ext. 6395.

D. Pacemaker Clinic is held every Monday from 9:00 a.m. – 12:00 p.m. in Area 2 on the 1st floor.
   • Enrollment into the clinic can be obtained by submitting a Pacemaker consult.
   • Interrogations and findings from this clinic are found in CPRS in the “notes” menu.
   • Other inquiries, such as for the acute interrogation of a pacemaker, can be made by contacting the Electrophysiology Fellow and leaving a message for Stephanie Yoakum, NP at ext. 6395 or Elizabeth Greer, RN at ext. 7961.

E. ICD Clinic is held every Thursday from 1:00 p.m. – 4:00 p.m. in Area 2 on the 1st floor, concurrently with the Arrhythmia clinic.
   • Enrollment into the ICD clinic can be obtained by submitting an AICD consult.
   • Interrogations and findings from this clinic are found in CPRS in the "notes" menu.
   • Other inquiries, such as for the acute interrogation of an ICD, can be
made by contacting the Electrophysiology Fellow and leaving a message for Stephanie Yoakum, NP at ext. 6395 or Elizabeth Greer, RN at ext. 7961.

F. **ICD Clinic** is held every Wednesday from 9:00 a.m. – 12:00 p.m. in Area 1B.

G. **Outpatient Cardiology consult services** run several daily clinics that are accessed by placing a Card Outpatient consult or ACS consult:
   - High risk pre-operative risk stratification
   - Geriatric Cardiology clinic (for patients older than 70)
   - ACS follow up clinic
   - Post-op follow up clinic for CABG and valve replacement

H. **Cardiomyopathy Clinic** is held every Wednesday from 8:30 a.m. – 12:00 noon in the Access Clinic on 3 West. Appointments are obtained by placing a consult to Card CHF, referral through New Patient Cardiology clinic or Inpatient Cardiology consults.