# Curriculum
## Cardiac Electrophysiology Rotation

### Description of Rotation or Educational Experience
The Cardiac Electrophysiology (EP) Fellowship Rotation at Stanford Hospital provides an introduction to the diagnosis and management of cardiac arrhythmias and to the field of cardiac electrophysiology.

### Specific educational goals for this rotation include:
- Interrogate and assess the function of pacemakers and ICDs
- Diagnose and treat common arrhythmias such as atrial fibrillation, atrial flutter, SVT, A-V block, and VT
- Describe the management of syncope
- Interpret abnormalities of the ECG, ambulatory ECGs (Holter monitors, event monitors), and ECG stress tests
- Describe the basic elements, success rate, and risks of common arrhythmia procedures

### Progressive Education
Over the two months of this rotation, fellows demonstrate increasing proficiency in the evaluation and management of patients with arrhythmias by:
- Being able to independently interrogate arrhythmia devices, including pacemakers, ICDs, and event monitors
- Providing independent assessment of arrhythmia and develop appropriate management plan.
- Demonstrate increased understanding of the indications for and performance of diagnostic EP studies and intracardiac ablative procedures.

### Patient Care
**Goal**
Fellows must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Fellows are expected to:

**Competencies**
- Counsel and educate patients and their families
- Develop and carry out patient management plans
- Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families

**Objectives**
- One of the key clinical endeavors on this rotation is for the cardiology fellow to evaluate patients on the Arrhythmia in-patient service, and provide input to the assessment and treatment of patients as well as being a major link for patients and their families to the health care system.

### Medical Knowledge
**Goal**
Fellows must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological,
and social-behavioral sciences, as well as the application of this knowledge to patient care. Fellows are expected to demonstrate:

**Competencies**
- Know and apply the basic and clinically supportive sciences which are appropriate to their discipline

**Objectives**
- Fellows must know key literature (see references) related to management of Arrhythmia patients, as well as develop knowledge in the skills noted in the rotation objective.

**Practice-Based Learning and Improvement**

**Goal**
Fellows must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life long learning. Fellows are expected to develop skills and habits to be able to:

**Competencies**
- Analyze practice experience and perform practice-based improvement activities using a systematic methodology.
- Apply knowledge of study design and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness.

**Objectives**
- Fellows are provided with on-going feedback on their proficiency in interpreting data acquired on this rotation (e.g. Holter monitors, EKGs, device interrogation) and their ability to improve reading skills is monitored.
- Key clinical studies are provided and fellows are expected to analyze this data and incorporate it into clinical practice.

**Systems Based Practice**

**Goal**
Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. Fellows are expected to:

**Competencies**
- Incorporate considerations of cost awareness and risk-benefit analysis in patient care.
- Understand how their patient care and other professional practices affect other health care professionals, the health care organization and the larger society and how these elements of other systems affect their own practice.

**Objectives**
- Device reimbursement is related to guidelines for device utilization and fellows learn how to relate clinical practice to guideline use.
- Evaluating and managing patients with serious arrhythmias requires knowledge of therapeutic options as well as the risk benefit analysis for an individual patient.
- Management of patients with cardiac devices requires co-ordination of care with various other providers, including the referring physician, technicians who monitor the arrhythmia transtelephonically, and consideration of the cost effectiveness of these interventions.
**Professionalism**

**Goal**
Fellows must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. Fellows are expected to demonstrate:

**Competencies**
- Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent and business practices.
- Demonstrate sensitivity and responsiveness to patients’ culture, age, gender and disabilities.

**Objectives**
- Fellows are instructed in HIPPA regulations for patient privacy and respect the need to maintain privacy both of patient information.
- In evaluating patients with arrhythmias, fellows encounter patients from many different cultural backgrounds at Stanford, as well as many elderly and female patients and need to be appropriately responsive.

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**Competencies**
- Work effectively with others as a member or leader of a health care team or other professional group.
- Use effective learning skills and elicit and provide information using effective nonverbal, explanatory, questioning and writing skills.

**Objectives**
- The Arrhythmia Service involves an extensive health care team, including nurses, nurse practitioners, electrocardiographic technicians, cath lab nursing and technician staff and clinic nursing and ancillary staff. The cardiology fellow helps to facilitate patient care by communicating between the different people involved in patient care.
- Fellows frequently need to explain advanced technology to patients, patients’ families, and health care providers.

**Teaching Methods**
Educational methods include, but are not limited to:
- Didactic lectures in the core curriculum
- Educational Arrhythmia Rounds
- Daily patient management rounds
- Direct supervision by Arrhythmia Service attendings
- Feedback on EKG and ambulatory monitoring interpretations from attending physician.
- Access to on-line educational resources as

**Assessment Method (fellows)**
- Individual review of ECG, ambulatory ECG, and ECG stress tests reading by Attending physician
- Individual review of pacemaker or ICD interrogation by Arrhythmia Nurse Specialist or Attending physician
- Individual review of consultation note by Attending physician
- Direct observation of patient history and physical examination by Attending physician
- Individual Discussion of patient case with Attending Physician

In addition, fellows are given individual, oral feedback at the end of the rotation. Written evaluations are entered into MedHub. Performance of the fellows in the program is reviewed on a semiannual basis with input from attendings on all the services. This cumulative feedback is then provided to the fellow by the fellowship director.

### Assessment Method (Program Evaluation)

During the rotation and at the conclusion, fellows are asked whether their learning objectives are being met. Also, at the end of the rotation, fellows are asked to provide anonymous written feedback, as well as participating in semiannual meeting of all the cardiovascular fellows to evaluate the program.

### Level of Supervision

- Daily rounds are conducted with the direct supervision of the Arrhythmia Service attending and patient management is reviewed.
- All EKGs, ambulatory monitoring reports, and treadmill tests are overread by an attending and feedback is provided to the fellow as needed.
- All device interrogation is reviewed with an attending physician or pacemaker nurse.

### Rotation director

Paul J. Wang, M.D.  650-723-7111

### Educational Resources

**WEBSITES** for cardiovascular guidelines:

- American Heart Association: www.americanheart.org (search guidelines with site search function)
- American College of Cardiology: www.acc.org (quality and science tab)

**On-line learning resources:**

- Cardiosource.com: Stanford has purchased full online access, which includes online textbooks (e.g., Braunwald's Heart Disease), online copies of meetings, and self-assessment programs (including ACC ECG interpretation modules).
- The Internet is available in the EP fellows room for ready access to Pubmed searches and other sources

**Required Readings:**


J Brugada et al Long-term Follow-up of Individuals with the Electrocardiographic Pattern of Right Bundle-Branch Block and ST-segment Elevation in Precordial Leads V1 to V3. Circulation 2002; 103:73-78.


