

Curriculum

Echocardiography Rotation

Description of Rotation or Educational Experience

The goal of this rotation is for the cardiology fellow to understand the basic aspects of cardiac ultrasound, including physical principles, instrumentation, cardiovascular anatomy, cardiovascular physiology, and cardiovascular pathophysiology. Over the four months of this rotation, the fellow will become familiar with the technical performance, interpretation, strengths, and limitations of 2-dimensional echocardiography and Doppler

Specific educational goals for this rotation include:

- Mastering the skills of performing a transthoracic echocardiogram and Doppler examination and be able to integrate their understanding of 3-dimensional cardiac anatomy
- Understanding how to perform a stress echocardiogram, including exercise stress as well as pharmacologic stress testing
- Developing the skills to independently perform a transesophageal echocardiogram
- Correlating the findings from the echocardiographic and Doppler exam with the results of other imaging modalities and physical examination
- Being able to integrate the results of the echocardiographic examination and findings of other cardiovascular tests, such as cardiac catheterization, coronary angiography, and electrophysiology

Progressive Education

Over the four months of this rotation, fellows progressively develop the skills to independently perform and interpret 2-D and transesophageal echocardiograms and the appropriate use and interpretation of Doppler ultrasound. As fellows progress through their training, there is a progressive increase in autonomy in the performance and interpretation of the above diagnostic tests. The rate of progression in this autonomy is based on the skill development of each individual as determined by supervising physicians.

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

- Perform competently all medical and invasive procedures considered essential for the areas of practice.
- Work with health care professionals, including those from other disciplines, to provide patient focused care.

Objectives

- Fellows learn to perform a standard 2D echocardiogram with routine Doppler for assessment of presence or absence of aortic and mitral stenosis, valvular regurgitation, presence of wall motion abnormalities, LV function, RV function and pericardial effusion.
- Fellows must qualify for use of conscious sedation using the Stanford accreditation module.
- Fellows assess patients before conscious sedation to evaluate the appropriateness of the

sedation for the individual patient.

- Fellows must communicate with echocardiography technicians in order to obtain the optimal study for each patient, as working as part of a team which can include anesthesia for transesophageal echocardiography or nursing staff to do stress echocardiography.

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

- Mastering the skills of performing a transthoracic echocardiogram and Doppler examination and be able to integrate their understanding of 3-dimensional cardiac anatomy
- Understanding how to perform a stress echocardiogram, including exercise stress as well as pharmacologic stress testing
- Detailed, specific educational objectives are provided in the orientation to the rotation.

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.
- Use information technology to manage information, access on-line medical information and support their own education.

Objectives

- Fellows monitor their own skill development in the performance of 2-D and transesophageal echocardiography by both their own analysis of images, but also with on-going faulty feedback on skill proficiency.
- As noted in resources, much of the training material for echocardiography is on-line and the fellows have ready access to computers in the echo laboratory.

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

Objectives

- Risk-benefit analysis is an important in a procedural specialty, such as echocardiography. Fellows are assessed by the appropriateness of their recommendations for intervention based on the patient's medical need and condition. This is particularly true in the performance of transesophageal echocardiography which requires conscious sedation.

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.

Objectives

- Fellows are instructed in HIPPA regulations for patient privacy and respect the need to maintain privacy both of patient information. Performance of echocardiograms.
- Fellows obtain informed consent for conscious sedation before transesophageal echocardiography, and need to be aware to clinically evaluate patients and provide appropriate risk/benefit analysis for the individual patient.

Interpersonal and Communication Skills**Goal**

Fellows must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates. Fellows are expected to:

Competencies

- Work effectively with others as a member or leader of a health care team or other professional group.

Objectives

- Fellows must communicate with echocardiography technicians in order to obtain the optimal study for each patient, as working as part of a team which can include anesthesia for transesophageal echocardiography or nursing staff to do stress echocardiography.

Teaching Methods

Educational methods include, but are not limited to:

- Core conferences on both echocardiography and basic cardiovascular anatomy
- Direct attending supervision of the performance and interpretation of 2-D and transesophageal echocardiography, Doppler ultrasound and conscious sedation.
- Fellows are expected to prepare a conference presentation on an echocardiography related subject during each of their rotation months.
- Fellows are an integral component of the weekly imaging conference at SUH.

Assessment Method (fellows)

The attending physicians, both inpatient and outpatient, as well as the cardiology fellow perform an independent review of physical examination, clinical data and assess the resident's conclusions based on that data. Fellows are given immediate feedback on whether their assessment and plan is appropriate at the time of presentation.

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
<ul style="list-style-type: none"> • When learning new procedures, fellows receive direct supervision from attendings or experienced echocardiographic technicians. • For cases requiring conscious sedation, the attending is present for all cases as training commences and is immediately available as the fellow develops proficiency. • All echocardiograms are overread with the faculty and feedback is provided.
Rotation Directors
<ul style="list-style-type: none"> • SUH: Ingela Schnittger, M.D. • VAMC: Paul Heidenreich, M.D.
Educational Resources
<p>WEBSITES for cardiovascular guidelines:</p> <ul style="list-style-type: none"> • American Heart Association: www.americanheart.org (search guidelines with site search function) • American College of Cardiology: www.acc.org (quality and science tab) • National Guideline Clearing House: www.guideline.gov <p>Textbooks which provide resource information:</p> <ul style="list-style-type: none"> • Textbook of Clinical Echocardiography (Otto) • Echocardiography (Feigenbaum) • The Echo Manual (Oh, Seward, Tajik) • Principles and Practice of Echocardiography (Weyman) • Anatomic atlases: <ul style="list-style-type: none"> • Cardiac Anatomy (Anderson, Becker) • Heart and Coronary Arteries (McAlpine) <p>On-line learning resources:</p> <ul style="list-style-type: none"> • 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 SAP, Echo SAP, and Heart Valve SAP). • The Internet is available in the echo lab for ready access to Pubmed searches and other sources