Echocardiography Laboratory
VA Boston health care system
Echocardiography rotation for the first year BMC Cardiology Fellows
Duration: 2 months
Education Director: Jayashri Aragam M.D.

In the section that follows, the rotation will be reviewed according to the following outline:

A) Overview
B) Principal Teaching/Learning Activities
C) Principal Educational Objectives
D) Recommended Resources
E) Evaluation Methods
F) Service Expectations

A) Overview:

The educational goal of the echocardiography lab rotation at the VA for the first year BMC fellows is to establish competency in performing and interpreting transthoracic echocardiograms

The Echo rotation at the VA provides unique opportunities for learning to perform and interpret transthoracic studies as well as to learn the basics of Transesophageal and Stress Echocardiography. Transthoracic echocardiograms are performed daily on a wide variety of often sick patients with state-of-the art digital imaging systems. As the first year cardiology fellow, one can read and interpret echocardiograms as the primary echo reader and interpret preliminary findings via the digital echo reading system, with supervision by the echo attending staff prior to on-line release. This provides a unique opportunity to get hands-on experience with the interpretation and reporting of a high volume of echocardiograms of much different pathology.

You will also have the opportunity to perform transthoracic echocardiograms with the help of an excellent team of sonographers led by Lauren Motola, the Echo Supervisor, and Yan Zhang, the Technical Director. As a first year fellow, one will be able to learn the fundamentals of scanning and will perform a minimum of one study everyday in a systematic manner following our scanning protocol. You will be assigned a patient to scan each day at 8:30 am (**Please make sure you arrive a few minutes earlier to prepare for your patient.)**Your scanning will be closely supervised by one of our experienced sonographers, Kevin Galizio (left handed scanner). If you are unable to scan at 8:30 am, it is your responsibility to seek Kevin out in order to meet your scanning quota for the day. If wish to scan with your right hand you will work with Lauren. Both Kevin and Lauren will do their best to let you know when a patient is available for scanning but it is your primary responsibility to make this a priority in your rotation.

With the recent acquisition of several new Philips echo systems with capabilities of 3D imaging, fellows will be able to learn the basics of 3D imaging and interpretation.

By the end of the 2 month rotation in the echo lab the fellow will have developed clinical expertise in the performance and interpretation of transthoracic echocardiograms and learned the basics of Transesopohageal and stress echocardiograms.

B) Principal teaching and learning activities:

1. Daily interpretation sessions:

The fellow will pre-read the echocardiograms and prepare the report which will be reviewed by the attending in the lab during these sessions, with one on one feedback. During these sessions a significant amount of time is spent with the fellow in reviewing the core echo topics pertaining to the case as well as discussing the clinical implications of the echo findings. Often coronary angiograms and other modes of imaging such as nuclear studies and CTs as well as clinical information on the patient are reviewed for correlative imaging. Almost always prior studies are reviewed to make a note of the interval change in the echo findings. Referring physicians are called to discuss the critical findings.

2. Core lecture series:

These are one hour lectures devoted to core echocardiography topics given once a month by the VA Echo Lab faculty as well as guest faculty.

3. Echocardiography case conference:

These are one hour conferences prepared and presented by the 1st and 2nd year fellows as well as the imaging fellow. Interesting cases of the month are chosen for this conference and discussed in detail by the fellows with significant feedback from the attending staff.

4. Nuclear cardiology conference:

These are one hour lectures presented once a month by the nuclear medicine staff at the VA and devoted to core topics in nuclear cardiology.

5. CT/MR/Vascular:

These are presented once a month by the VA as well as guest faculty.

6. Cardiology grand rounds:

Typically occur every Tuesday morning and are presented by VA staff, guest faculty and Cardiology Fellows.

C) Principal educational objectives:

Core clinical competencies

A) Ability to perform transthoracic echocardiogram
B) Ability to interpret transthoracic echocardiogram, stress echocardiogram and contrast echocardiograms
C) Expand clinically applicable knowledge base relevant to echocardiography
D) Critically evaluate current medical information and scientific evidence relevant to echocardiography
E) Behave professionally towards patients, families, colleagues and all members of the healthcare team
F) Communicate effectively with patients and families as well as physician colleagues at all levels
Communicate effectively with all non-physician members of the healthcare team to assure comprehensive and timely care of hospitalized patients
G) Teach other physician and non-physician members of the healthcare team effectively

CORE CURRICULUM: (Echocardiography)

Transthoracic echo (TTE)

The fellow will develop expertise in performance and interpretation of all areas of transthoracic echocardiography, including: 2D, M-mode, Doppler and color Doppler. This will include recent advances such as contrast imaging, harmonic imaging, tissue Doppler, and three-dimensional imaging.

Other forms of echocardiography:

Transesophageal echo (TEE)

a) The fellow will learn the basics of TEE

b) Will learn the indications, contraindications as well as complications of the procedure

c) Will learn the role of TEE in the diagnosis of specific disease entities including:

Valve pathology with particular focus on aortic and mitral valve diseases
Aortic pathology, including aortic dissection, ulceration and hematoma

Cardiac source of embolus
Prosthetic valve function/dysfunction
Infective endocarditis and its complications

Stress echocardiography

The fellow will learn the basics of performing and reporting Exercise and Pharmacological Stress Echocardiography.

Contrast echocardiography

The fellow will become experienced in the use of contrast echocardiography for LV opacification, and as a diagnostic adjunct in patients undergoing stress echocardiography.

Tissue Doppler imaging

The fellow will be trained in this technique and will learn the potential clinical applications.

Three-Dimensional Echocardiography

The fellow will be trained in the basics of real time 3D echo performance and interpretation.

D) Recommended resources:

Resources include all members of the Cardiology faculty, as well as the technical staff in the lab. We strongly encourage and recommend that the fellows review the primary literature as their major resource. There is a binder in the echo lab that contains important original articles related to core echo topics as well as all the lab protocols (these are also available on the service drive in the learning resources folder). Some of the standard text books in echocardiography are also available for reference.

Fellows have access to a learning resource folder in the computer in which important guideline documents in echo as well as review articles are placed.

Fellows also have access to a folder online in which a log of interesting cases from the lab is organized by diagnosis and is readily available for review.

E) Evaluation Methods:

The cardiac fellows are evaluated by the attending physician. Attending physicians are expected to provide face-to-face feedback on a case-by-case basis as well as at the end of the rotation. Attending physicians also provide a written evaluation of

each fellow which the fellow can then view at a later date. Direct feedback is made on a case-by-case basis and at the discretion of the attending physician. If the attending physician notes problems with respect to a fellow an additional meeting is set-up between the attending physician and that fellow to discuss what the problems are and how they might be corrected.

F) Service Expectations:

1. **Work day begins at 8AM**. If you are unable to be at work by 8AM please notify the attending of the day. Fellow is responsible for arranging coverage for any planned absence and this should be communicated to the attending of the day in advance. Yan Zhang is the acting Echo Supervisor, please communicate with her at the end of the day and review the schedule for the next day.

2. **Interpreting Transthoracic studies**: It is recommended that you **read at minimum**, 5-6 transthoracic studies every day and maintain a log of studies interpreted. This is very important and will help you meet the COCATS requirements. You can find the studies on the wall in the reading room. **It is recognized that the first year fellows will have minimum or often no experience in echo interpretation when they start the rotation. The attending will be reading the studies with the first year fellows until they learn the basics and become comfortable reading independently.**

3. **Performing and interpreting Transesophageal studies:** You will not be doing any TEE in your first rotation. You may occasionally perform TEEs during your second rotation if the attending feels that you are ready.

4. **Supervising and interpreting exercise and dobutamine stress echocardiograms:** This is a shared responsibility predominantly between the 2nd year BWH fellow and the echo fellow. There will be a Master monthly schedule in the echo lab that will indicate the fellow responsible for this. On occasion (to accommodate the schedule) this will be preformed by the BMC first year fellow after getting approval from the attending of the day. On days you are responsible for stress echocardiograms you should review the protocols (placed in the learning resources folder), screen the patient as well as obtain informed consent. **Reports should be completed the same day and reports of all positive studies should be conveyed to the referring physicians.** Templates for the procedure note and the report are available in the Echo reading folder. **The first few procedures will be coached and supervised entirely by the attending in the lab.**

5. **Non-invasive imaging conference** is held every Friday at Noon. The third Friday of the month is devoted to clinical highlights of the month; interesting cases of the month will be presented by the fellows in the lab. You will share this responsibility with the other fellows in the lab. You can always seek help

and input from the attending staff. It is suggested that cases for discussion are chosen from the WRVA echo lab rotation.

6. **Learning resources folder**: This is placed in the echo reading folder and contains all the echo lab protocols as well as several echo websites that can be used to access formulas to calculate valve areas as well as quantify valvular regurgitation. Several key guideline documents and articles can be found in this folder. You are welcome to add to this folder.

7. **Interesting case folder:** Interesting cases are logged in this folder. Please make sure you add to this folder every day by logging good teaching cases. (Typically any case with which you can make a teaching point.)