
Rotational Non-Invasive Guideline

Educational Purpose of the Rotation

Non-invasive rotations are both required and ongoing throughout the three-year training period. This rotation provides the sub-specialty resident with exposure to a variety of cardiology and vascular testing modalities common to the practice of cardiology and vascular medicine. These testing modalities include electrocardiography, echocardiography, exercise testing (treadmill, bicycle and pharmacological), ambulatory electrocardiography (holter monitoring), event monitoring, ambulatory blood pressure monitoring, stress echocardiography and nuclear stress testing. This experience includes "hands on" training for the performance of echocardiography. It should be noted that aspects of these testing modalities are also addressed in other rotation guidelines such as the actual reading of the nuclear studies in the nuclear rotation as well as performance and interpretation of specialized echocardiography transesophageal echocardiography rotation. Cardiac rehabilitation experience is also provided during this rotation. Each Sub-specialty resident is expected to complete at least ½ day per week during one rotation in the cardiac rehabilitation unit at Sparrow Health System.

Resources.

Locations for this rotation include Michigan State University (MSU), Sparrow Health System and McLaren Greater Lansing. These facilities provide cutting edge technology and modern facilities for a variety of testing modalities. By utilizing these facilities, all required diagnostic tests are available to the patient for more comprehensive diagnosis and management.

Referrals to this service occur via cardiologists (both MSU and private), primary care physicians and other services. The patients consist of both genders, diverse ethnicity and socioeconomic backgrounds. The diagnoses may include evaluations for chest pain, palpitation, syncope, ischemia, dyspnea, heart murmur, congenital heart disease, hypertension, valvular disease, cardiomyopathy, restrictive physiology, family history of coronary artery disease, hyperlipidemia or other risk factor assessments. Also included in this population are those individuals undergoing screening testing for exercise programs, athletic participation and cardiac rehabilitation.

Rotation Attendings

George Abela MD	Edward Helble DO	Richard Pinke DO
Appa Bandi MD	Todd Hickox DO	David Rhine MD
Thomas Brown DO	John Ip MD	James Schafer MD
Mark Castellani MD	Michael James DO	David Strobl DO
Nam Cho DO	George Kleiber DO	Joni Summit DO
Joel Cohn MD	Kirk Laman DO	Ranjan Thakur MD
Christopher D'Haem	Dale Leffler DO	Ronald Voice MD
Gaurav Dhar MD	Chad Link DO	Mathew Wilcox DO
Carlos Fernandez DO	Daryl Melvin MD	Peter Yoo MD
Ibrahim Shah MD	Mohan Madala MD	Omar Bakr MD
Majid Mughal MD		

There is at least one and occasionally two sub-specialty residents assigned to the non invasive rotation during any given rotation.

Responsibilities

This is both a required and continuing rotation throughout the training program. Sub-specialty residents rotate to this service on multiple occasions during the training period. During these rotation periods they are expected to:

1. Participate in cardiovascular testing at MSU, Sparrow Health System and McLaren Greater Lansing (primarily vascular and nuclear testing).
2. Obtain the appropriate data from the medical record and patient history prior to testing in order to determine the indications for testing, safety of the requested testing and the possible or probable outcome of the test.
3. Perform "hands on" echocardiographic studies with assistance from the technologist.
4. Be knowledgeable regarding appropriate contraindications and end points for testing.
4. Actively participate in the examination, monitoring and reporting of the requested test.
5. Present all relevant patient information and data to the attending physician.
6. Dictate and communicate test results to referring physicians, patients, patient families and other consulting physicians as necessary in order to facilitate patient care.
7. Work effectively with all members of the health care team.

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8. Prepare, present and discuss cases during Cardiology Grand Rounds and Echocardiography conference as required.
9. Review and be prepared to discuss relevant literature references.

Objectives

As this is an ongoing rotation completed in phases during the course of the training program the expectation is that the sub-specialty resident will progress through levels of competence in this area. By the conclusion of all rotations the sub-specialty resident will:

1. Demonstrate proficiency and working knowledge related to the various cardiovascular testing modalities common to a general cardiology practice.
2. Demonstrate increased knowledge of indications, contraindications, probable outcomes and procedural risks.
3. Demonstrate a proficiency in requesting appropriate imaging modalities associated with stress testing.
4. Demonstrate proficiency in the performance of echocardiography.
5. Demonstrate the ability to acquire patient information critical to testing outcomes via the patient interview and review of the medical record prior to initiation of testing.
6. Recognize abnormal testing results and act accordingly.
7. Review and dictate results with the attending physician in a logical, timely and concise manner.

Instructional Methods

Attending physicians participating in this rotation will:

1. Supervise and instruct the sub-specialty residents in accordance with the Supervision Policy.
2. Provide an atmosphere allowing for responsible patient care while encouraging subspecialty residents to assume more primary responsibility as their skills progress.
3. Provide sub-specialty residents with ongoing feedback regarding the progression of skills.
4. 4. Provide structured teaching opportunities including appropriate literature references citations for review and discussion.

Stress Echocardiography

Stress echocardiography is an important part of the Non-Invasive experience. The primary goal of the stress echocardiography experience is to allow the Sub-specialty residents the opportunity to participate in one of imaging modalities utilized in stress testing.

The goals/objectives of this experience include but are not limited to:

1. Demonstrate an increased understanding of the indications and contraindications for stress echocardiography.
2. Demonstrate an increased awareness of the risks and benefits associated with stress echocardiography.
3. Progression in the increasing ability to request the appropriate imaging modality for a given patient/pathology including choosing between testing options (treadmill, bicycle, pharmacological) as well as imaging (echocardiography, nuclear).
4. Demonstrate an increased proficiency in interpretation of resting and exercise images in a comparative format.
5. Provide attending physicians with -an appropriate pre-procedural work up including a focused history and physical and preliminary interpretation of the echocardiography images.
6. Actively participate in the interpretation and dictation of final reports including both the, electrocardiographic and echocardiographic portions of the examination.

Sub-specialty residents are required and expected to participate in the stress echocardiography experience during the Non-Invasive rotations. Additionally they are expected to rotate to Cardiology Rehab 1/2 day a week=4 hours, during the non invasive rotation.

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Transesophageal Echocardiography

The primary goal of the transesophageal echocardiography (TEE) experience is to provide sub-specialty residents with the experience and exposure necessary to appropriately assess patients for the procedure as well as the performance and interpretation of the test. The first exposure to TEE occurs in the second year of the training program. Between the second and third years of training sub-specialty residents participate in 3 to 4 rotations in this specialization including experience with both the sedated and anesthetized patient in the operating room. The operating room experience is helpful to the sub-specialty resident in perfecting their understanding and knowledge of the views. By the conclusion of this training the sub-specialty residents will have successfully served as primary operator on 40-50 cases.

The goals/objectives of the transesophageal echocardiography training include but are not limited to:

1. Demonstrate an increased proficiency in the selection, insertion and positioning of the TEE probe.
2. Demonstrate an increased awareness of the indications, risks and possible outcomes of TEE.
3. Acquire the skills necessary for monitoring patients prior to, during and following TEE procedures.
4. Actively participate in the gathering of and interpretation of TEE data including learning how to appropriately maneuver the probe, dictate reports and review results.
5. Provide the attending physician with an appropriate pre-procedural work up including a focused history and physical and presentation of informed consent to the patient.

Sub-specialty residents are required and expected to participate in the TEE training aspect of this program. Additionally, they are expected to present case studies with a focus on TEE during Echocardiography conference.

Cardiac Rehabilitation

The cardiac rehabilitation experience provides the Sub-specialty residents with the opportunity to interact with the rehabilitation staff and patients. The primary goal of this rotation is to allow the Sub-specialty resident to observe and monitor patients during their rehabilitation activities.

This rotation occurs as a part of the Non-Invasive rotation. During one of the rotations each **Subspecialty resident is required to attend sessions for 1/2 day per week in the cardiac rehabilitation clinic**. In addition the Cardiac Rehabilitation staff are invited to provide a lecture during Cardiology Grand Rounds during the year.

The goals/objectives of this experience include but are not limited to:

1. Demonstrate an increased understanding of the indications and contraindications for cardiac rehabilitation.
2. Demonstrate an increased awareness of the risks and benefits associated with cardiac rehabilitation.
3. Acquire the skills necessary for monitoring patients during and following cardiac rehabilitation.
4. Have an increased awareness of the appropriate time interval for cardiac rehabilitation in relationship to the pathology of the patient (ex. MI, stroke, surgery, PTCA) and the types of evaluations that are required prior to initiation of rehabilitation.
5. Develop skills necessary to establish initial exercise prescription and ongoing modification of the prescription using exercise testing results.
6. Develop understanding of appropriate fitness levels for various activities of daily living and for return to work.
7. Participate in educational components of cardiac rehabilitation including dietary modification, stress reduction, smoking cessation and exercise prescription. Sub-specialty residents are required and expected to participate in the cardiac rehabilitation experience of this program. Attendance is monitored and reported back to the program office.