

Rotational Cardiovascular Nuclear Imaging Guideline

Educational Purpose of the Rotation

The cardiovascular imaging rotation provides the sub-specialty fellows with experience in a combination of imaging modalities. This rotation occurs at Michigan State University, Sparrow Health System, and the Thoracic Cardiovascular Institute. These specifically include nuclear cardiology, and CT and PET scanning. Sub-specialty fellows may also gain experience in CT coronary angiography. Cardiac MRI, which is still under development at this time, but is available at outside hospitals. Sub-specialty fellows assigned to this rotation are provided with more than adequate experience in reading nuclear scans, administration of radiopharmaceutical doses, working with the nuclear technologist to prepare and calibrate the equipment, and patient supervision (620 hours). In addition, sub-specialty fellows are permitted time away from the program to participate in an intensive didactic nuclear training program. Completion of this program (80 hours) provides the sub-specialty fellow with the necessary requirements to sit for the nuclear medicine boards.

Rotation Attendings

George Abela MD	Daryl Melvin MD
Appa Bandi MD	Richard Pinke DO
Sonali Arora MD	James Schafer MD
Thomas Brown DO	Joni Summit DO
Nam Cho DO	Ronald Voice MD
Joel Cohn MD	Mathew Wilcox DO
Christopher D'Haem DO	Peter Yoo MD
Gaurav Dhar MD	
Todd Hickox DO	
Chad Link DO	

One to two sub-specialty fellow(s) are assigned to this rotation at one time. This is a required rotation and fellows must complete at least 3-4 rotations during the three-year training program.

Resources

All facilities currently house several nuclear imaging cameras, which are state of the art. It should be noted that sub-specialty fellows also garner experience in the administration of nuclear material while on this rotation as well as on the non-invasive rotation when materials are administered during stress testing.

Both of these sites provide a significant patient population with a mix of pathologies. In addition, sub-specialty fellows are given the opportunity to work in the preventative medicine domain through the coronary calcium scoring via CT scanning. Patients include both gender groups as well as individuals of a broad spectrum of ethnic, racial, and socioeconomic backgrounds. Extensive reading time provides fellows with the opportunity to clearly define reversible vs. fixed defects, cardiac hemodynamics, administration and pharmacology of tracer agents utilized in nuclear imaging.

The didactic program provides sub-specialty fellows with certification in the following four basic areas of nuclear medicine:

1. Principles of Radiation Physics
2. Medical Radiation Protection
3. Medical Radiation Instrumentation
4. Radiopharmaceuticals and Chemistry

Completion of this didactic coursework (80 hours) along with the clinical experience permits the sub-specialty fellow to apply for permission to sit for the nuclear medicine boards. Sparrow Health System also houses a 64 Slice CT Scanner. Under the guidance of Dr. Wilcox and Dr. Voice, the fellows gain exposure to CT coronary and peripheral angiography. The sub-specialty fellows are taught the indications for an angiography, the timing of the contrast administration and base anatomy of the vascular system.

Responsibilities

The expectations and responsibilities of this rotation apply to all sub-specialty fellows (this is a required rotation).

1. Participate in cardiovascular testing as related to cardiology imaging modalities. Fellows are required 620 hours (16 weeks) throughout the three years of training.
2. Obtain the appropriate information from the medical record and the patient history prior to testing to determine indications for testing, safety of the requested test, and possible outcome.

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3. Work effectively and actively participate with all members of the team including the nuclear technologist to prepare, calibrate, and administrate the radiopharmaceutical doses either alone or in combination with treadmill or pharmacologic stress testing.
4. Have a working knowledge of the risks and contraindications for nuclear testing including knowledge of testing end points.
5. Have a working knowledge of the requirements for CT, MRI and PET scanning including indications/contraindications and appropriateness of testing.
6. Documentation of the additional 80 hours of didactic training over the three-year program.
7. Review at least 300 nuclear scans, 30 of which require hands on involvement. 10 cases of a must have cardiac catheterization correlation.
8. Spend one day with the nuclear specialty laboratory to learn how the nuclear tracer is made and handled prior to transfer to various testing facilities.

Objectives

By the conclusion of the training program the sub-specialty fellow will have completed two to four rotations in cardiovascular imaging. The sub-specialty fellow will:

1. Demonstrate a proficiency and working knowledge of nuclear imaging specifications including the preparation, calibration, and administration of radiopharmaceutical doses.
2. Demonstrate an increased knowledge in the indications for specific cardiac imaging by indicating the appropriate study (nuclear, MRI, CT, PET) for the pathology under review (for example myocardial viability).
3. Demonstrate proficiency in interpretation and dictation (under the direction of the attending physician) of radionuclide studies including angiographic and hemodynamic data.
4. Demonstrate an increased proficiency in calcium scoring via CT scan and in developing a treatment/care plan dependent upon those results (further testing, risk factor modification, or continued follow up care).
5. Demonstrate the ability to refer, recommend, and know the contraindications of cardiac imaging.
6. Demonstrate the ability to acquire pertinent patient information critical to testing outcomes prior to initiating testing.
7. Recognize abnormal testing results and act accordingly.
8. Demonstrates understanding of indications for CT angiography, and know normal and abnormal anatomy of vasculature and atherosclerotic disease.

Instructional Methods

Attending physicians participating in this rotation will

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

Evaluation Process

At the conclusion of each rotation:

1. Attending physicians will summarize and accurately describe the subspecialty fellow's performance on the provided evaluation form. The attending physician will review this evaluation with the sub-specialty fellow and both will sign their acknowledgment and return the form to the program office for review by the program director and inclusion in the file.
2. The sub-specialty fellow will summarize and accurately describe both the faculty performance as well as the relative value of the rotation on the provided form and return it to the program office. In order to insure anonymity, these comments are entered into a database program and the original forms are destroyed.

Additional Information: Other cardiac imaging modalities including PET with onsite cyclotron, MRI, and CT scanning that are housed at Michigan State University in the Clinical Center.

Readings: As assigned.

Schedule: Please refer to master sub-specialty fellow schedule.

Competency Level: Completion of the cardiac imaging rotation would permit the sub-specialty fellow to qualify for Level 2 competency under COCATS4 Guidelines.