



The Ohio State University Medical Center, Division of Cardiovascular Medicine
Nuclear Cardiology Lab:
Fellowship Training Guidelines and Clinical Responsibilities

General Information

Duration of rotation: 4 weeks
 Location to report on 1st day: Ross Heart Hospital Nuclear Cardiology Lab

Recommended Reading:

Textbooks:

1. Clinical Gated Cardiac SPECT, Edition 2 by Guido Germano and Daniel Berman
2. Stress testing: Principles and Practice Fifth Edition by Myrvin Ellestad
3. Fundamentals of Nuclear Pharmacy by Gopal B.Saha

Web-based:

1. The American Society of Nuclear Cardiology – www.asnc.org.
2. The American College of Cardiology – www.acc.org.
3. Nuclear medicine information, cardiology section-www.nucmedinfo.com/

Teaching Methods:

1. Imaging Conferences.
 - a. Didactic topics in nuclear cardiology.
 - b. Case-based discussions.
2. Clinical teaching.
3. Individual performance, interpretation of studies.
4. Faculty mentorship.
5. Fellow-directed supplemental reading.

Overall Curriculum Goals During 36-Month Fellowship:

1. Instruction in basic principles of nuclear medicine and physics.
2. Instruction in basic cardiovascular anatomy, physiology, pathophysiology.
3. Understanding of nuclear cardiology within a clinical context.
4. Understanding of safety in handling and administration of radioactive materials.
5. Competency to perform a complete interpretation of a cardiac imaging procedure in the following areas:
 - a. Single photon emission computed tomography (SPECT).
 - b. Radionuclide (blood pool) angiography (RNA).

First Year Fellow in Cardiovascular Medicine:

Overall Focus: Stress/rest SPECT procedure

Number of months: 2

Objectives:

1. Become familiar with operations of nuclear stress lab.
2. Learn basic physics of radionuclides.

3. Understand indications and published guidelines for ordering a stress SPECT study and RNA study.
4. Learn standard format for typical SPECT and blood pool studies.
5. Develop SPECT and RNA interpretation skills with staff guidance.
6. Develop capabilities for interpretation and supervision of exercise testing, pharmacologic stress testing, cardiopulmonary exercise testing

Mandatory Reading:

Introductory and appropriate chapters in textbooks listed above, or equivalent.

Clinical Responsibilities:

1. Develop daily schedule (with other fellows in the stress lab if necessary) that allows for:
 - a. Supervision of and participation in nuclear stress studies in conjunction with qualified laboratory personnel.
 - b. Processing of acquired imaging data.
 - c. Interpretation of at least 100 nuclear cardiac cases under preceptor supervision.
2. Assist with lab administrators and technology staff with specific tasks (i.e. intravenous access, helping to decipher unexpected findings to determine whether it is safe to discharge an outpatient after their scan, calling services when orders for SPECT studies are ambiguous or inappropriate, etc.)
3. **Perform and interpret stress ECG's, SPECT and RNA scans, providing preliminary interpretation to be discussed with attending staff.**

Didactic Responsibilities:

Each first year fellow is encouraged to present a case series, composed of teaching cases encountered on the rotation, with correlation with angiographic or other modalities, and corresponding literature citation.

Second Year Fellow in Cardiovascular Medicine:

Overall Focus: SPECT and blood pool image interpretation, training regarding the safe and appropriate use of diagnostic radioactive materials

Number of months: 0-4

Objectives:

1. Continued development SPECT and blood pool image interpretation skills, including incorporation of computer methods for analysis.
2. Radiation safety training and experience sufficient for qualification as authorized user of radioactive materials in accordance with the regulations of the NRC and/or the Agreement States.

Mandatory Reading:

1. Specialized, diagnosis-specific chapters in textbooks listed above, or equivalent, to include appropriate reading on radiation physics.
2. American Society of Nuclear Cardiology guidelines and statements.
3. Formal training sufficient for authorized user status (offsite if necessary)

Clinical Responsibilities:

1. Develop daily schedule (with other fellows in the nuclear lab if necessary) that allows for:
 - a. Interpretation of at least 300 nuclear cardiac cases under preceptor supervision, with at least 30 cases with catheterization/angiographic correlation.
 - b. Hands-on supervised experience with a minimum of 50 patients (optimally 25 with SPECT and 25 with blood pool imaging), including pre-test patient evaluation, radiopharmaceutical preparation (including radionuclide generators and CT systems), setup of gamma camera and CT system, calibration and administration of dosage setup of image computer, and data processing.
2. Assist with lab administrators and technology staff with specific tasks (i.e. intravenous access, helping to decipher unexpected findings to determine whether it is safe to discharge an outpatient after their scan, calling services when orders for SPECT studies are ambiguous or inappropriate, etc.)
3. Perform and interpret SPECT and blood pool radionuclide images, providing preliminary interpretation with digital reporting system.

Didactic Responsibilities:

Each second year fellow is required to present a case-based conference, including correlative data from angiography and other diagnostic modalities, and literature validation of data significance.

Third Year Fellow in Cardiovascular Medicine:

Overall Focus: Qualitative and quantitative interpretation of SPECT and blood pool studies; interpretation of cardiac PET studies; research, education, lab directorship.

Number of months: 0-6

Objectives:

1. Continued development of nuclear cardiac image interpretation skills.
2. Training in directorship of a nuclear cardiology lab and/or participation in training program.
3. Laboratory and or clinical nuclear cardiology research.

Mandatory Reading:

1. Specialized, diagnosis-specific chapters in textbooks listed above.
2. American Society of Nuclear Cardiology guidelines and statements.
3. Primary literature regarding utilization and technical features of echocardiography.

Clinical Responsibilities:

1. Develop daily schedule (with other fellows in the nuclear lab if necessary) that allows for:
 - a. Cumulative interpretation of at least 600 nuclear cardiac cases under preceptor supervision, with catheterization/angiographic correlation in at least 60 cases.
 - b. Hands-on supervised experience with a minimum of 50 patients (optimally 25 with SPECT and 25 with blood pool imaging), including pre-test patient evaluation, radiopharmaceutical preparation (including radionuclide generators and CT systems), setup of gamma camera and CT system, calibration and administration of dosage setup of image computer, and data processing.

- c. Participation in ongoing laboratory and/or clinical research, with individual responsibility for a segment of that research
2. Assist with lab administrators and technology staff with specific tasks ((i.e. intravenous access, helping to decipher unexpected findings to determine whether it is safe to discharge an outpatient after their scan, calling services when orders for SPECT studies are ambiguous or inappropriate, etc.)
3. Perform and interpret SPECT and blood pool radionuclide images, providing preliminary interpretation with digital reporting system.

Evaluation:

Fellows will be assessed and evaluated by the faculty, based on the 6 core competencies and associated Milestones. Examples are listed below:

Competencies	Milestones
Patient Care	<ul style="list-style-type: none"> ▪ Demonstrates skill in performing and interpreting non-invasive procedures and/or testing
Medical Knowledge	<ul style="list-style-type: none"> ▪ Possesses clinical knowledge ▪ Knowledge of diagnostic testing and procedures
Systems-Based Practice	<ul style="list-style-type: none"> ▪ Works effectively within an interprofessional team
Practice-Based Learning and Improvement	<ul style="list-style-type: none"> ▪ Learns and improves via feedback
Professionalism	<ul style="list-style-type: none"> ▪ Has professional and respectful interactions with patients, caregivers and members of the interprofessional team ▪ Exhibits integrity and ethical behavior in professional conduct
Interpersonal and Communication Skills	<ul style="list-style-type: none"> ▪ Communicates effectively in interprofessional teams