

**Nuclear Cardiology/Cardiac CT
RI Hospital**

Overview of Rotation

Revision Date: April 2006

I. GENERAL INFORMATION	
Name of Rotation	Nuclear cardiology/Cardiac CT
Director	James Arrighi, M.D.
Duration of Rotation	1 month
Location	RI Hospital
Administrative/Secretarial Contact & Phone	Jane Freer, 444-8041
Location to report on first day of rotation	Main Bldg, Rm 209
Resident Study/Resource Area	Cardiology fellows room, 7 th Floor APC

II. FACULTY	Drs. Arrighi, Noto, Yoo, Abbott, Gilson, Levine, Robertson, Weigner
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Lines of Responsibility (in order):

In all clinical in-patient rotations, cardiology fellows will interact with generalists and specialists in all areas, functioning as consultants for cardiovascular problems. This rotation is laboratory-based, and as such the fellow's primary responsibility is related to the performance and interpretation of diagnostic cardiac imaging studies. Particularly close interactions are fostered with referring physicians (all specialties), house staff, stress lab nurse clinicians, and imaging technologists. The team is led by the attending, who bears final responsibility for patient management and image interpretation. The cardiology fellow is next in line, followed by medical residents if present on the rotation.

III. GENERAL GOALS AND EDUCATIONAL OBJECTIVES FOR THIS ROTATION

General Goals: Nuclear cardiology and cardiac CT training requires an understanding of cardiovascular pathology, physiology, and anatomy. These methods provide important diagnostic and prognostic information. As a first or second year fellow, the 2 months required in this area is designed to provide the general (level I) training necessary for a clinical cardiologist to understand the role of nuclear cardiology and cardiac CT in general clinical practice. This rotation, with others, also will serve to allow the fellow to achieve competence in stress testing procedures. As an elective (additional months in the 2nd or 3rd year), the primary goal of this rotation is to achieve level 2 or 3 competency in nuclear cardiology and/or cardiac CT.

Objectives:

First and Second Year Core 2 Month Requirement:

1. Gain proficiency in the performance and interpretation of exercise and pharmacologic stress testing. (this is also acquired in other noninvasive imaging rotations)
2. Understand the essentials of pretest patient evaluation.
3. Acquire a working familiarity with published guidelines for stress testing.
4. Understand the main aspects of imaging interpretation for nuclear cardiology and cardiac CT procedures. Competency to practice nuclear and/or cardiac CT imaging independently is not an objective.
5. Understand the role of these procedures in clinical practice, including: diagnostic and prognostic utility, cost, and limitations.
6. Obtain a general familiarity with radiation safety as it relates to nuclear and CT procedures.

Elective (for level 2 or 3 training; see ACC COCATS guidelines):

1. Learn the indications, advantages, and limitations of nuclear cardiac imaging and/or cardiac CT.

2. Learn the indications, contraindications, and limitations of all stress testing modalities (exercise and pharmacologic).
3. Learn to interpret nuclear cardiology studies (myocardial perfusion imaging and radionuclide angiography) and/or cardiac CT (coronary calcium and angiography) studies.
4. Learn how to clearly and accurately generate reports.
5. Learn how to acquire and process studies.
6. For individuals who wish to achieve level 2 or greater training in nuclear cardiology, they must gain an understanding of nuclear imaging technology and radiation safety. Radiation safety training is in part obtained through a formal didactic course, as per NRC guidelines.
7. For individuals who wish to achieve level 2 or greater training in cardiac CT, they must gain an understanding of CT technology, protocols, and radiation safety.

IV. TOPICS/TEACHING METHODS/MATERIALS USED DURING THIS ROTATION

Specific topics to be covered during this rotation:

Nuclear cardiology
Cardiac CT

Principal teaching methods (see section IX):

Clinical teaching (A)
Clinical experiences (B)
Performance feedback
 Monthly evaluations (C1)
 Semiannual evaluations (C2)
Conferences (nuclear conference) (D)

Educational materials provided/referred to the resident:

Introductory texts (*required reading*):
 Chaitman BR. Exercise stress testing. In: Braunwald's Heart Disease, 2005
 Udelson JE et al. Nuclear cardiology. In: Braunwald's Heart Disease, 2005
 Achenbach S. Current and future status on cardiac CT for diagnosis and risk stratification.
 J Nucl Cardiol 2005;12:703-13.
 Shaw LJ, Iskandrian AE. Prognostic value of gated myocardial perfusion SPECT. J Nucl Cardiol 2004;
 11:171-85.
Supplemental introductory text:
 Heller GV. Nuclear cardiology: Practical applications, 2005.
Advanced text:
 Zaret BL, Beller GA. Clinical nuclear cardiology, 2005.
 Hachamovitch R et al. Incremental prognostic value of myocardial perfusion single photon emission
 computed tomography for the prediction of cardiac death. Circulation 1998; 97:535-43.
 Raff GL et al. Diagnostic accuracy of noninvasive coronary angiography using 64-slice CT.
 J Am Coll Cardiol 2005;46:552-7.

V. EVALUATIONS

A. Evaluation of the resident's successful completion of the above goals will be carried out by the attending physicians. Assessment methods includes:
 Clinical performance ratings: Rotation evaluations (1A), semiannual evaluations (1B)
 Focused observation and evaluation (2)
 Faculty/staff meetings (4)
 Procedure logs (5)
 Project reports (portfolio) (6A)

B. Residents will evaluate the rotation annually.

VI. RESPONSIBILITY OF ATTENDING ON ROTATION

1. Read and report all clinical studies on the day performed.
2. Teach fellow in the principles and practice of nuclear cardiology and/or cardiac CT.
3. Recommend appropriate reading material for fellows.
4. Clearly communicate availability and reading schedule to fellow on a daily basis.

VII. RESPONSIBILITY OF RESIDENT ON ROTATION

1. Observe isotope preparation, dose (or dye) administration, image acquisition, and image processing for 5 studies. (Coordinate with lead cardiac technologist, Ron Bailey) For level 2 or 3 training, the minimum number of procedures should be performed according to current ACC COCATS guidelines.
2. Perform stress testing according to schedule determined at beginning of month, coordinated with nursing staff (Cheryl Gleason, RN, supervisor). *First and second year fellows must be present for an average of 5 stress tests per day.* Default schedule is: fellow has primary responsibility for stress testing in one room on Tuesdays and Thursdays.
3. When needed, screen studies for appropriateness, communicate with referring physicians, and answer questions from clinicians about any aspect of the study.
4. Prepare daily studies for reading, according the attending schedule.
5. Review all studies, before attending review if possible, and formulate an initial summary of findings and conclusions.
6. Obtain correlation with other imaging studies.
7. Record interesting cases in case log book.
8. For any cases presented at cardiology conference with nuclear or CT correlation, the fellow is responsible for presenting these cases and coordinating with the primary presenter.
9. Prepare one nuclear conference on a topic in nuclear cardiology (after discussion with attending).
10. Estimate number of studies read at end of each rotation and record in procedure log.
11. For senior fellows (after first 2 months in lab), the fellow will manage all aspects of the laboratory under the direction of the attending of the day.

VIII. CONFERENCE AND CLINIC SCHEDULE SPECIFIC TO THIS ROTATION

	Monday	Tuesday	Wednesday	Thursday	Friday	
AM	None.	Nuclear conference (noon; monthly)				
PM						

IX. CORE COMPETENCY CURRICULUM

Competency Category	Specific Goals	Teaching & Assessment (sections IV, V above)
Medical Knowledge	Demonstration of investigatory and analytical thinking relevant to the clinical rotation	A,B,C,D -- 1,2,4,5,6A
	Acquisition the appropriate background relevant to specific rotations	B,C -- 1,2
Patient Care	Application of basic and population science to practice	A,B,C,D -- 1,2,6A
	Obtains appropriate information concerning the patient (history, past medical records, examination)	B,C -- 1,2,4
	Knowledge of the appropriate indications for diagnostic and therapeutic cardiology procedures	A,B,C -- 1,2,4

	Understands utilization of information technology as it relates to clinical care of patients	B,C -- 1,2
	Procedures: ECG, Holter	B,D -- 2
	Procedures: Stress testing (level 1)	B -- 2,5
	Procedures: Echocardiography or Nuclear Imaging (level 1)	A,B,C -- 1,2,4,5
Practice-Based Learning & Improvement	Demonstration of self-critical thinking and motivation to improve	B,C -- 1,2,4
Professionalism	Commitment to professional responsibilities and ethics	B,C -- 1,2,4
	Commitment to ongoing professional development	B,C -- 1,2,4