QUICK REFERENCE GUIDE TO UCSD NUCLEAR MEDICINE RESIDENT ROTATION MAY 2024:

- Hours: 8 am – 5 pm Monday – Friday

- Residents are expected to be present in nuclear medicine on all days assigned to the service. Their exact location may be subject to staffing requirements; however, all changes MUST be approved by the faculty member at UCSD, Hillcrest. The nuclear medicine faculty works very closely with the Radiology department to accommodate special requests.

- Rotation Goals:
    - Interpretation of all studies performed in the department (with allowances made for the resident's training year, experience, and work flow). This includes general nuclear medicine, PET/CT, and theranostics. Additional responsibilities include study protocols, interaction with clinicians, shadowing technologists and staff, and teaching the junior residents, medical students, and visiting physicians.

- Activities include daily monitoring of myocardial stress studies, observing treatments and consultations, reading out with assigned attending and participating in conferences, journal club, presentations, and research. Additionally, EPIC study protocoling performance.

- The resident should spend at least ½ day per nuclear medicine rotation in the hot lab and shadowing Technologists'.

- Instances when residents are re-assigned to ROPCC contrast supervision they are expected to communicate with Hillcrest onsite Nuclear Medicine Attending for their assignment for that day. Situations when more than one resident are on the Nuclear Medicine rotation, the Department expectation is such that if any one- day resident re-assignment is needed, then at least one resident will be left behind in Nuclear Medicine.

- Residents responsibilities include clearing the Nuclear Medicine HC, Thornton, and PET/CT lists. The senior resident may be called upon to ensure enforcement requiring close collaboration with the on- site Hillcrest attending.

- Relating to Wednesday Resident megaconference, Residents will be excused at 1:45 pm to attend the 2:45 pm conference.

UCSD
DEPARTMENT OF NUCLEAR MEDICINE

Jacob's Medical Center & Hillcrest sites & off-campus facilities such as our PET/CT centers or affiliated sites).

RADIOLOGY RESIDENT RESPONSIBILITIES / RESOURCES GOALS & OBJECTIVES

2024

Foreword

The faculty of the division of Nuclear Medicine would like to take this opportunity to welcome you to our service. We look forward to working with each of you on multiple occasions in your training rotations in Nuclear Medicine. Our goals are to educate you with respect to the methods and applications of this fast-growing and exciting modality.

We are here because you are here. All of us love to teach, share our experiences, engage with you as colleagues, and ultimately, enable you to understand and appreciate the role Nuclear Medicine can play in the care of our patients.

The Table of Contents will outline the myriad of learning objectives we feel are of critical importance to your experience in Nuclear Medicine. This is a living document; we expect changes as new and improved methods are developed. We welcome your input, comments, and criticisms.

All of us have spent years working with residents; it is a true privilege and pleasure. We will work hard to provide you with a stellar rotation, one to learn from, carry you into the future, and enjoy!

Expectations for the Residents

We expect that the residents will demonstrate continuing maturity and expertise during each year, and show progressive transition to the next level of competency. Upon completion of their training, all residents are expected to be board eligible for the Certifying examination administered by the American Board of Radiology (ABR).

Nuclear Medicine Faculty

Sherief Gamie, MD

Brief bio + picture (same for all faculty)

Amir Rad, MD

Esther Choi, MD

Kristina Elizabeth Hawk, MD

Ernest Belezzuoli, MD

Ryan Pham, MD

Michael Kipper, MD

Policy

The following sections are separated into general requirements and training year requirements. The training year requirements are based upon post-graduate year (PGY).

General Requirements

I. **These guidelines are specific to the Nuclear Medicine Division at UCSD. Unless modified by the Nuc. Med. Faculty, these guidelines will also apply to other sites including (East campus….). Please review the requirements provided by others.**

II. **UCSD sites Residents are expected to be present in nuclear medicine on all days assigned to the service. Their exact location may be subject to staffing requirements; however, all changes MUST be approved by the faculty member at UCSD, Hillcrest. The nuclear medicine faculty works very closely with the Radiology department to accommodate special requests.**

III. **Resident hours are Monday-Friday, 8 AM-5 PM. After hours call is taken by the nuclear medicine faculty. Scheduled conferences are recognized as critical to residents training, and attendance is encouraged.**

Relating to Wednesday Resident megaconference, Residents will be excused at 1:45 pm to attend the 2:45 pm conference.

IV. **Training of Residents' competence in general nuclear medicine is one of our main objectives. The following responsibilities will promote this goal: interpretation of all studies performed in the department (with allowances made for the resident's training year, experience, and work flow). This includes general nuclear medicine, PET/CT, and theranostics. Additional responsibilities include study protocols, interactions with clinicians, shadowing technologists and staff, and teaching the junior residents, medical students, and visiting physicians.**

V. **Activities include daily monitoring of myocardial stress studies, observing treatments and consultations, reading out with assigned attending and participating in conferences, journal club, presentations, and research. Additionally, EPIC study protocoling performance for a morning and afternoon session.**

VI. Instances when residents are re-assigned to ROPCC contrast supervision they are expected to communicate with Hillcrest onsite Attending for their assignment for that day.

VII. Instances when more than one resident are on the Nuclear Medicine rotation, the Department expectation is such that if any one- day resident re-assignment is needed than at least one resident will be left in Nuclear Medicine.

VIII. Hot lab: training within the hot lab is extremely important to assure that residents understand the hot lab equipment, the packaging and opening of the delivered radioisotopes, the function and use of the dose calibrator, the use of the nuclear probe, the critical step of verifying each dose activity, and the necessity for keeping careful records. The resident should spend at least ½ day per nuclear medicine rotation in the hot lab and shadowing Technologists', learning the following requisite skills. Daily: opening the hot lab, checking in the radiopharmaceuticals, assessing the dose calibrator for constancy and channel check, and the gamma camera daily QC (with Co-57

source), daily flood, and energy peaking. The resident will also learn the weekly tasks (e.g., bar phantom), monthly QC (center of rotation), and handling of a radioactive spill, storage of waste, and all other jobs performed by the nuclear medicine technologist.

IX. Residents responsibilities include clearing the Nuclear Medicine HC, Thornton, and PET/CT lists. The senior resident may be called upon to ensure enforcement requiring close collaboration with the on- site Hillcrest attending.

X. Contribution to nuclear medicine folder "interesting cases"
folder" are located in the folder directory.

Residents are strongly encouraged to add interesting cases (with patient MRN) to this folder and create a new PowerPoint for each calendar month.

XI. Case Presentation and Journal Club Responsibility

Expected Knowledge Base by PGY

At the end of year I (PGY II), competency is expected in the following areas:

- **knowledge of the clinical indications, general procedures, and scintigraphic findings in:**
- **ventilation and perfusion imaging (including quantitation)**
- **hepatobiliary imaging (including interventions)**
- **gastrointestinal blood loss imaging**
- **Gastric emptying**
- **skeletal imaging**
- **renal imaging (including diuretic renography)**
- **thyroid imaging (including uptake measurements)**
- **brain imaging (the basics)**
- **abscess/infection imaging**
- **cardiac imaging (myocardial perfusion, amyloid, MIBG, sarcoid, MUGA, viability); acquire a thorough understanding of rest and stress imaging, ECG gating, stress testing, and image processing**
- **lymphoscintigraphy and lymph edema studies**
- **theranostics (the basics)**

- **the basics of PET/CT imaging, including patient preparation, and the concepts of uptake times, blood sugar measurement, SUV calculation, non-attenuation versus attenuation-correction imaging, and the different isotopes used in PET/CT**
- **the basic physical principles of nuclear medicine imaging and instrumentation**
- **identify and understand the isotopes utilized in nuclear medicine**
- **understand the principles and protocols for radioiodine use in hyperthyroidism and thyroid cancer**
- **demonstrate a responsible work ethic**
- **participate in quality improvement/quality assurance activities**

The Accreditation Council for Graduate Medical Education (ACGME) requires competency in the following areas:

- **the ability to make decisions only at your level of personal competence; SEEK HELP**
- **assist with radioactive therapies, understanding the importance and details of the consent form**

- **review of the patient histories to determine relevance of the studies, alternative studies, and advise the technologists about special views or protocol alterations**
- **dose adjustments based upon clinical scenarios or other factors**
- **participation in uncommonly performed studies**

At the end of year II & III (PGY III & IV), competency is expected in the following areas:

- **identify normal and abnormal findings on all nuclear medicine imaging studies**
- **knowledge and understanding of all the components of a nuclear medicine study; including, indications for performing the study, correlative examinations, protocols, radiopharmaceuticals utilized (including, dose, route of administration, potential for false positive and false negative results, study enhancements, patient preparation, and reporting of results)**
- **PET/CT imaging, indications, and reporting**

- **review and dictate, in conjunction with the faculty, all studies performed in the department, as well as remotely**
- **participate in the teaching of junior residents, medical students, and departmental staff**
- **development of the skills to interact with referring physicians in a timely, collegial, and respectful manner; this will include physicians involved with your patient's study, consultants, and all those involved directly in his/her care**

At the end of year IV (PGY V), competency is expected in the following areas:

- **demonstrate a thorough knowledge of the indications, procedures, and findings in myocardial perfusion studies (rest and stress), stressors used (exercise and pharmaceutical), all computer-assisted programs for evaluation, quantitation, and image quality, and correlative studies which may be of patient benefit**
- **demonstrate knowledge of the clinical indications, general procedures, and findings in PET/CT applications / examinations.**

- **observe FDG PET/CT study (including injection, image acquisition for CT & PET, and processing)**
- **observe FDG brain PET scan (injection, image acquisition, and image processing)**
- **understand the material used for PET shielding (instead of lead), set-up and purpose of reclining chair and the uptake room, performance of the SUV measurement, basic components of the CT system and the PET detectors**
- **understand patient monitoring requirements (notably, exercise and drug cardiac studies and examinations requiring pharmacologic intervention)**
- **for all radiopharmaceuticals, be able to discuss production of isotopes, physical properties of isotopes, elution of agents and quality control, radiopharmaceutical compounding, and bio-distribution**
- **describe procedures for instrument quality control**
- **with the assistance of the hot lab technologist, develop an understanding of the types of records which must be maintained in order to comply with**

local, state, and federal guidelines for radiation safety

General Goals

The following goals are intended as guidelines to improve the quality of care in the Nuclear Medicine division. Their understanding and adoption will markedly enhance our patient experience and care

Patient Care: provision of compassionate and appropriate care; demonstrate the ability to gather essential and accurate patient information; demonstrate an understanding of indications, contraindications, radiation risks, and post-procedural management of nuclear medicine theranostics procedures and management; demonstrate an ability to counsel a patient and obtain informed consent before performing an invasive procedure, including a description of the procedure, risks, benefits, and alternatives

Medical Knowledge: demonstrate knowledge of established and evolving biomedical information; understand patterns seen in Alzheimer's dementia, fronto/temporal dementia, multi-infarct dementia,

dementia with Lewy bodies, Parkinson's syndromes, cortical-basilar degeneration, progressive supranuclear palsy, multisystem atrophy, and seizure disorders

Practice-based Learning and Improvement: continuously practice self-improvement; based upon specific requirements, maintain a log of all procedures performed, including complications

Interpersonal and Communication Skills: demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals; provide effective and timely feedback and education to nuclear medicine technologists regarding quality of examinations

Summary

This is a living document, designed to be modified on a regular basis, and as needed. We hope that it will give you the guidance and direction you need. You are our most valuable assets. Please feel free to make recommendations for improvement and to help us stay up to date. Together, we can make Nuclear Medicine at UCSD not only a superior modality for our patients, but a wonderful, rewarding, and educational experience for all of you!

Appendix A

Required hours during the 4-year radiology residency

https://www.nrc.gov/reading-rm/doc-collections/cfr/part035/part035-0390.html

(b)(1) Has completed 700 hours of training and experience, including a minimum of 200 hours of classroom and laboratory training,

		required (hours)			UCSD hrs/yr	4 yrs residency hrs total
Classroom and laboratory training						
	radiation physics, instrumentation		UCSD nuclear physic		5	20
	radiation protection		Noon conferences		45	180
	mathemetics in radioactivity		(imbeded physics)			
	chemistry of byproducts					
	radiation biology					
		200				200
						4 yr residency
Work experience						hrs total
	scan interpretaion			wks/yr	3	
				days/wk	5	
				hrs/day	8	
	review cases		case reviews (hrs/yr		5	
		500				500
	TOTAL	700			TOTAL	700

NUCLEAR MEDICINE RESIDENT COMPOSITE EVALUATION METRICS

Name:	Rotation Dates	Score
Punctuality		
Attendance & Engagement		
Interaction with Attending		
Collaboration with Dept. Staff		
Knowledge Base / Competence		
Subject matter Interest / Enthusiasm		
Case Preparation & presentation		
Effective use of “System”		
Report reflects a sophisticated analysis and diagnosis		
Total		

Score of 1 - 5