Molecular Imaging Services, Inc.

Limiting Radiation Exposure

Americans receive the most medical radiation in the world. Diagnostic imaging is one of the sources and while these exams have led to significant improvements in detecting critical conditions, their use exposes patients to ionizing radiation, which may elevate one's lifetime risk of cancer. Lowering patient exposure has become a key initiative for medical societies and regulatory agencies.

- **SNMMI:** Radiation dose from all NM and MI procedures should be optimized so that the patient receives the **smallest possible dose** of radiopharmaceutical that will provide the appropriate diagnostic information
- **ACR:** Image Wisely. The ACR supports the **"as low as reasonably achievable"** (ALARA) Principles
- **ASNC: Decrease patient radiation exposure** to less than 9 mSv per entire study in 50% of patients
- **ICANL:** Administered radiopharmaceuticals must use the **lowest radiation dose** necessary to acquire a diagnostic quality image

Patient Profile

Age 60 year old Female
History of breast cancer. Status post Mastectomy in conjunction of chemo and radiation therapy. Chief complaint is dyspnea on exertion that is progressively becoming worse.

- Evaluate for CAD
- Cardiac PET ordered due to its lower radiation compare to SPECT imaging

Estimated Effective Radiation Dose

The table below provides a summary of the estimated radiation exposure to patients for each procedure.

Procedure	Estimated Effective Dose (mSv)[1]
Thallium-201 stress/redistribution	22
Technetium-99m sestamibi stress/rest SPECT	17
Percutaneous coronary intervention	15
CT Coronary angiogram-retrospective with ECG tube modulation	9
Diagnostic coronary angiogram	7
NH3 13N-Ammonia Rest Stress	3.98
Low-dose stress Technetium-99m tetrofosmin CZT imaging	4.2
CT coronary angiogram-prospective	3
Rubidium-82 stress/rest PET	**2.76**
PA chest x-ray	.01

Cardiac PET Offers Advantage or Reduced Radiation

1. A complete gated rest/stress PET MPI study can be performed under 5mSV of exposure to patient
2. Reduces Radiation, not accuracy
3. Meets ASNC recommendation of reducing exposure in myocardial perfusion imaging equal to or below 9 mSV

1. Information courtesy of ImageWisely.org

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