

## Molecular Targeting Probes - Radioactive and Nonradioactive

## Special MTA: Dosimetry & Image Analysis Posters

# Methods to reduce nuclear medicine staff radiation exposure from 18FDG exams

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### Abstract No. 1519

**Objectives:** Use of 18FDG continues to grow in oncologic and neurologic applications as imaging sensitivity has increased and amount of time required to perform procedures has decreased. Procedures in our practice increased from 30 in 1997 to 1832 in 2010, with mean nuclear medicine technologist annual radiation exposure approximately doubling. Methods utilizing time, distance, and shielding have been evaluated in an effort to reduce exposures, with emphasis on the injection and transport of 18FDG patients.

**Methods:** A time analysis study was initially conducted to determine the aspects of an 18FDG procedure that require the longest time. Landauer TLD-100, Landauer Luxel OSD, and Mirion TLD-760 whole body dosimeters were used in our historical review of cumulative exposure while Mirion TLD-760 and Quantum Products Direct Ion Storage Instadose dosimeters were used in our prospective analysis of methods to reduce cumulative whole body exposure. All dosimeters were NVLAP approved and worn at chest level. In our prospective analysis, injection and transport activities were evaluated separately. Variability between dosimeters and effect of positioning the patient were also analyzed.

**Results:** Segregating the injection area by at least 10 feet from patients waiting to be scanned reduced nuclear medicine technologist exposure by 20%. Radiation exposure from transporting injected patients approximately 160 feet to the PET CT scanner ranged from an average of 1.23 millirem/patient (including positioning on table) to 0.59 millirem/patient (excluding positioning). During recent renovation, the injection and waiting area was moved adjacent to the PET CT scanner (40 feet from the table), resulting in a decrease in exposure during transit to 0.22 millirem/patient. Converting from a unit dose to the MEDRAD Intego injection system reduced whole body exposure from an average of 1.4 millirem/patient to 0.57 millirem/patient.

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**Conclusions:** Multiple aspects of 18FDG exams are amenable to changes that reduce nuclear medicine staff radiation exposure

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