


Name of Policy: <u>Quality Control of Nuclear Medicine Equipment</u> Policy Number: 3364-135-136 Department: Radiology Approving Officer: Chief Operating Officer - UTMC Responsible Agent: Chairman & Professor, Radiology Scope: Radiology	 Effective Date: 12/1/2021 Initial Effective Date: 10/31/2012
<input type="checkbox"/> New policy proposal <input type="checkbox"/> Major revision of existing policy	
<input checked="" type="checkbox"/> Minor/technical revision of existing policy <input type="checkbox"/> Reaffirmation of existing policy	

(A) Policy Statement

Regular testing of nuclear medicine equipment shall be performed to ensure accurate patient dosing, appropriate image quality and compliance with state regulations.

(B) Purpose of Policy

To minimize the possibility of administering the wrong radiopharmaceutical activity, and to ensure proper operation of the measurement and imaging systems used in nuclear medicine procedures.

(C) Procedure

Radioactive sealed source audit and inventory will be conducted quarterly and submitted to the Radiation Safety Office.

Leak testing for sealed radioactive sources will be performed semi-annually. Results from leak testing cannot exceed 0.005 microcuries. Leaking sources must be immediately removed from service and reported to the Radiation Safety Office.

Dose calibrator accuracy: The dose calibrator will be tested upon installation and annually for accuracy relative to the activity of NIST reference sources. Accuracy must be within 10% of the current activity of the source.

Dose calibrator linearity: The dose calibrator will be tested upon installation and quarterly to be linear over the range of activities measured. The linearity must be within 10% of the best fit line data.

Dose calibrator constancy: The dose calibrator will be tested for constancy and will be performed daily prior to use. The measured activity of each isotope channel must be within 10% of the nominal value.

Dose calibrator geometry: The dose calibrator will be tested for geometry independence and will be performed upon installation and after repair using similar syringe size and volumes utilized in radiopharmaceutical dose measurements.

Sodium iodide well counters and the uptake probe should be tested daily or before use for calibration and constancy with a reference source. The results must be within 10% of average baseline.

Radioisotope efficiencies for the well counter will be performed annually and after repair using appropriate NIST reference sources for the radionuclide energies being surveyed for wipe testing.

GM survey meters will be tested prior to each use by performing a battery check and daily constancy with the check source. The measured rate must be within 10% of the activity noted on the calibration sticker for the probe used. All GM meters must be calibrated annually.

Glucometer testing will be performed daily with High/Low reference solution standards prior to use. Results out of range must be reported to Point of Care (POC) staff.

Nuclear Medicine and PET imaging systems will have routine quality control testing performed in accordance with the manufacturer's specifications and the American College of Radiology (ACR) and Joint Commission standards. This is to include daily, weekly, and quarterly QC performed by the nuclear medicine technologist and an annual evaluation performed by a certified medical physicist. Routine preventative maintenance will be performed by a certified biomedical engineer trained for that specific equipment.

The annual evaluation by medical physicist will include the following per ACR and Joint Commission requirements:

- 1) Nuclear medicine gamma camera
 - a) Image uniformity (Intrinsic and system)
 - b) High contrast resolution
 - c) Sensitivity
 - d) Energy resolution
 - e) Count rate performance
 - f) Artifact evaluation
 - g) SPECT image quality (if applicable)

- 2) PET scanner
 - a) Image uniformity
 - b) High contrast resolution
 - c) Low contrast resolution
 - d) Artifact evaluation

<p>Approved by:</p> <p><u>/s/</u> <u>12/20/2021</u> Haitham Elsamaloty, M.D. Date Chairman & Professor, Radiology</p> <p><u>/s/</u> <u>01/04/2022</u> Christine Stesney-Ridenour, FACHE Date Chief Operating Officer - UTM</p>	<p>Review/Revision Date: 10/01/2015 10/1/2018 12/1/2021</p>
<p>Next Review Date: 12/1/2024</p>	