Name of Policy:	**Quality Control of Nuclear Medicine Equipment**
Policy Number:	3364-135-136
Department:	Radiology
Approving Officer:	Director, Radiology - UTMC
Responsible Agent:	Assistant Professor & Deputy Clinical Service Chief
Scope:	University of Toledo Medical Center Radiology

UTOLEDO HEALTH

Effective Date:

Initial Effective Date: 10/31/2012

_____ New policy proposal
_____ Major revision of existing policy
__X__ Minor/technical revision of existing policy
_____ Reaffirmation of existing policy

(A) Policy Statement

Routine testing of nuclear medicine equipment shall be performed to ensure accurate patient radiopharmaceutical administration, optimal image quality and compliance with regulations involving radioactive materials (RAM).
~~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~~ incorrect prescribed radiopharmaceutical activity, and to ensure proper operation of the measurement and imaging systems used in nuclear medicine departments. ~~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.~~
Any nuclear medicine equipment that fails quality control testing must be removed from service until inspected and/or certified for use by the appropriate personnel. Repeat testing and performance evaluation may be required prior to clinical use, depending on the equipment.

Dose calibrator accuracy: ~~The dose calibrator~~Dose calibrator system 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~~ each source.

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

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

Dose calibrator geometry: ~~The dose calibrator~~Dose calibrator systems ~~-~~will be tested for geometry independence and will be performed upon installation, and after repair using the ~~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~~ calibrated daily ~~or~~ and tested for constancy before use ~~for calibration and constancy~~ with a NIST reference ~~source~~ sources approved by the manufacturer. ~~. The results must be within 10% of average baseline.~~

Radioisotope efficiencies and Minimum Detectable Activity (MDA) 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.

Chi-Square verification testing for well counters will be performed quarterly.

GM survey meters will be tested prior to each use by performing a battery check and a daily constancy check will be verified with the attached reference ~~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/CT 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~~includes ~~to include~~ daily, weekly, and quarterly ~~QC~~ testing performed by ~~the~~ nuclear medicine ~~technologist~~ personnel and an annual system performance evaluation performed by a certified medical physicist.

Routine preventative maintenance will be performed by a certified biomedical engineer or manufacturer field Service Engineer (FSE) 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~~

Approved by: Nathan Egbert, MD Assistant Professor & Deputy Clinical Service Chief — Date Ryan Landis, BSRT (R)(CT) Director, Radiology — Date	**Review/Revision Date:** 10/01/2015 10/1/2018 12/1/2021 **Next Review Date:** 12/1/2027