**Nuclear Medicine Physics Course**

**Laboratory Number 6: Extrinsic Flood Source Uniformity Test with Gamma Camera**

**Purpose**
To develop skills at performing daily gamma camera quality assurance tests.

**Equipment and Materials**
Gamma camera
Co-57 flood source

**Procedure for Daily Field Uniformity Test**

What is the purpose of a daily flood QC test? ________________________________________

Why is a 57-Co sheet source used? __________________________________________________

Why not use a 99m-Tc source? ____________________________________________________

Follow the daily procedure performed by a nuclear medicine technologist:

1. Prepare camera for test. (Set photopeak for Co-57 window, position the gamma camera, etc.)
   How should you “center” the photopeak? ____________________________________________
   Why is this important? __________________________________________________________

2. Place the Co-57 sheet source directly on the face of the collimator.
   What are the necessary properties of the flood sheet to perform this test properly?
   ____________________________________________________
   What is the stated activity of the Co-57 source? __________________________________
   What date was given for this activity? ___/___/_____
   What is the activity? ______________
   How often do you estimate you will have to buy a new source? _______________
   Why? _______________________________________________________________________
   Would you use the same source to obtain an intrinsic flood? ______.
   Explain_____________________________ _________________________________________

3. Acquire 10 million count image.

4. Compare the homogeneity of the imaged field with a standard or perform a digital analysis of
   the FOV uniformity. The visual comparison test involves a qualitative comparison of the test
   images with those previously obtained under the same conditions. For a digital test, the
   variations in pixel values across the face of the image are analyzed and compared to a
   performance specification criterion. **Which test is used for this camera?**
   _________________________________________________________________________
Field of view (image diameter) | Integral Uniformity | Differential Uniformity
---|---|---
Central (CFOV) | | |
Useful (UFOV) | | |

5. For a digital test obtain the pass/fail criteria from the quality control technologist. What are the criteria for this camera? ________________________________ Decide on whether the system passes or fails this test. __________________

6. Repeat for other cameras.

7. Measure the exposure rate in mR/h at the surface of the source.________

8. What does an exposure rate indicate? ________________________________

9. What are the safety issues with regard to this source? ________________________________

10. Return the source to its container. Measure exposure rate outside the container.________
    What are the safety issues now?__________________________.

11. Return source to its proper place – what are the criteria for a “proper place”? ____________
    ________________________________

12. Check your hands before leaving.

    Resident Name (print):___________________________Date:_______________

    Signature of person supervising lab: ________________________________

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