

AbstractID: 5088 Title: Annual Gamma Camera QC: Techniques And Phantoms To Simplify The Implementation Of The NEMA NU-1 Procedures For Tests Recommended By The ACR

The objective of this work is to present techniques to perform the NEMA tests that are suggested by the ACR for annual gamma camera QC. Since the recommendation contains nine tests, the goal is to devise simple and efficient procedures to reduce the required time without compromising the quality. Also included is a comparison of test equipment conforming to NEMA specifications to equipment made in-house.

The time to complete the annual QC is markedly reduced by the availability of specifically designed phantoms. They provide a reliable means to compare the cameras and to establish a performance baseline. For two tests, Multi Window Spatial Registration and SPECT Resolution with scatter, the NEMA prescribed equipment is compared with readily available devices. The comparison of the commercial MWSP device and the one produced in-house showed that the average maximum difference of the center of mass for the three Ga-67 peaks measured at various points across the crystal face is 0.35 mm vs. 0.33 mm for the commercial and the in-house device, respectively. For the SPECT resolution using three capillary tubes filled with Tc-99m, a NEMA phantom is compared to a modified Jaszczak phantom. The FWHM is 4.78 pxl vs. 4.79 pxl (radial) and 4.144 pxl vs. 4.167 pxl (azimuthal) for NEMA and Jaszczak phantom, respectively.

Further topics include sensitivity, count rate performance, comparison of fit methods, and monitor/printer QC.