quality control (QC) tests for scintillation camera performance. Unfortunately, these guidelines do not include tests for the SPECT/CT systems, particularly the involvement of CT in the SPECT images. Therefore, this study aims to develop an extension to NEMA NU 1 standard to include additional QC specification. These are: (1) SPECT/CT Spatial registration, (2) CT attenuation correction accuracy and (3) whole-body SPECT/CT scan uniformity. **Materials and Methods:** Test (1) was performed by using either plastic IV tube filled with oral CT contrast solution mixed with ^{99m}Tc or 1 mm diameter metallic line sources filled with only ^{99m}Tc. The fusion registration misalignments were quantified with the scanner software in 6 degrees of freedom. Test (2) was accomplished by using a 20 cm diameter cylindrical phantom, which was filled with approximately 200 MBq of ^{99m}Tc. ROI of areas ranging from 0.7 cm^{2}to 13 cm^{2}centred on the trans-axial slices were used. Test (3) was performed by acquiring a SPECT of a line source over two contiguous bed positions. The uniformity line profile was obtained by taking the sum of the counts in each SPECT slice as a function of slice location. **Results:** It was found that the software needed adequate contrast for both SPECT and CT images to accurately detect the two line sources for fusion. The counts in a ROI on the non-CT attenuation corrected SPECT image was compared to the same ROI on the CT attenuation corrected SPECT image. The maximum deviation from the average counts and its slice location were reported as percentage non-uniformity. **Conclusion:** In order to achieve accurate registration result, the metallic line source phantom is recommended. The accuracy of attenuation coefficient for water applied can be imperially determined. The maximum non-uniformity artefact result was satisfied. **References:** 1.Chakraborty, D., Bhattacharya, A., Gupta, A. K., Panda, N. K., Das, A., & Mittal, B. R. (2013). Skull base osteomyelitis in otitis externa: The utility of triphasic and single photon emission computed tomography/computed tomography bone scintigraphy. Indian journal of nuclear medicine: IJNM: the official journal of the Society of Nuclear Medicine, India, 28(2), 65. 2.NEMA (2013) NEMA Standards Publication NU 1-2012. Performance Measurements of Gamma Cameras. National Electrical Manufacturers Association Virginia 3.Bailey D, Humm J (2014) Nuclear Medicine Physics: A Handbook for Teachers and Students. IAEA4.Cherry SR, Sorenson JA, Phelps ME (2012) Physics in nuclear medicine, vol4th;4;. vol Book, Whole. Elsevier/ Saunders, Philadelphia

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Dual-Isotope Peptide Receptor Radionuclide Therapies with ^{177}Lu and ^{90}Y: Is Quantitative Imaging Possible?

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Aim/Introduction: Peptide receptor radionuclide therapy using DOTATATE labeled with ^{177}Lu or ^{90}Y is a promising treatment for neuroendocrine tumours. However, Kunikowska et al. (2011) has shown that using these two isotopes simultaneously results in better patient outcomes. As ^{90}Y emits higher energy β- particles than ^{177}Lu, personalized dosimetry should be performed to not exceed dose limits to critical organs while optimizing tumour control. Kidneys are the critical organs in this therapy, and large variations in their doses have been observed. Assuming identical biodistributions of ^{177}Lu- and ^{90}Y-DOTATATE, dosimetry can be performed using ^{177}Lu SPECT imaging. Only ^{177}Lu emits suitable photons for imaging, while ^{90}Y is a pure β- emitter and cannot easily be imaged. Moreover, Bremsstrahlung photons created by ^{90}Y can cloud the ^{177}Lu spectrum, making activity quantification inaccurate. This work aims to determine if dosimetry based on quantitative imaging of ^{177}Lu in the presence of ^{90}Y is possible. **Materials and Methods:** Monte Carlo GATE simulations were performed of spheres containing ^{177}Lu, ^{90}Y, or both placed in a phantom filled with cold water, water with ^{90}Y, or water with ^{90}Y+^{177}Lu. Eighteen different concentrations of ^{177}Lu and/or ^{90}Y in the spheres and seven different background configurations were imaged with a simulated Siemens Symbia camera. Concentrations of each isotope were chosen based on injected activities which would not exceed dose limits to critical organs. The quantification accuracy and noise distribution were determined for every configuration. **Results:** With no background in the phantom, quantification error of ^{177}Lu remained below 12% for low concentrations of ^{177}Lu (0.3 MBq/ml) and 3% for high concentrations (2 MBq/ml) for all ^{177}Lu to ^{90}Y sphere ratios. With ^{90}Y+^{177}Lu background, the error ranged from 6% for low background ratios (1:10 background to ^{177}Lu-source) to 24% for high ratios (1:3 background to ^{177}Lu-source). The noise levels ranged from 20% for low concentrations of ^{177}Lu in the sphere to below 5% for high concentrations. **Conclusion:** Activity quantification of ^{177}Lu in the presence of ^{90}Y is achievable with an acceptable margin of error ($<$ 15%) at low and high ratios of ^{177}Lu to ^{90}Y-sphere activity (maximum ratio 1:6) and moderate ratios of background to ^{177}Lu-source activity (maximum ratio 1:5). Errors are high ($>$ 20%) with high background ratios (1:3) but this is rarely seen in patients. This suggests that quantitative dosimetry in dual isotope PRRT is possible. **References:** Kunikowska et al., Eur J Nucl Med Mol Imaging, 2011. 38(10):1788-97.

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Shorter Dynamic Planar Scintigraphy to Estimate Myocardial [^{123}I]-MIBG Washout Rates

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Aim/Introduction: The heart-to-mediastinum ratio (HMR) and washout rate (WR) have served as simple semi-quantitative indices of myocardial [^{123}I]-MIBG scintigraphy for more than two decades. However, it is burdensome and inconvenient for patients with Parkinsonian symptoms to undergo the conventional scanning protocol, which demands two scans