

Fluctuation of SUV values with rotation of 6 insert sphere phantoms in the NEMA IEC BODY phantom

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Abstract

PET/CT images provide us with useful information of original cancers and their metastases. But standardized uptake values (SUV) obtained from the images may vary depending the location of the tumors due to some effects such as gamma ray absorption by the bed, attenuation correction and scatter fraction. National Electrical Manufactures Association (NEMA) sets positions for 6 insert sphere phantoms in the NEMA IEC BODY PHANTOM. We rotated the inserted 6 phantoms and obtained standardized uptake values (SUV) at the points of 0°, 90°, 120°, 150°, 210°, 270°, 300° and 330° to see if the values in the surface and those in the deeper spots of the NEMA PHANTOM are consistent. PET/CT acquisition times were 3 minutes (same as usual clinical condition) and 30 minutes (to get sufficient acquisition data). We set circle regions of interest (ROI) on the PET/CT images with the diameters of 37, 28, 22, 17, 13 and 10 mm, same as those of the 6 inserted phantoms.

In this study, though the SUV values of 10 mm phantom were found to be slightly lower at 0° and 330°, no significant difference was observed among SUV values in the surface and those in the deeper spots of the NEMA PHANTOM. We have yet to obtain data for more accurate evaluation.