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Assessment of the influence of the Beta parameter in the reconstruction of Q.Clear

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Author: Konrad Skórkiewicz

Co-authors: Anna Sowa-Staszczak, Kazimierz Łątka

Aim/Introduction: The aim of the study is to determine the appropriate value of the β parameter using the Q.Clear reconstruction algorithm in the imaging of patients with neuroendocrine tumors. **Materials and Methods:** The analysis concerned the measurements of the NEMA IEC Body Phantom, filled with Ga-68 gallium chloride. Within the phantom we placed the 4 smallest hot spheres filled with a higher isotope concentration in comparison with the body part. Imaging was performed in the PET/CT scanner in few time intervals. The raw data were reconstructed with the use of the Q.Clear reconstruction algorithm with 18 values of the β parameter (150-1000, every 50). **Results:** The obtained results show that together with an increase of the values of the β parameter, the image quality in the Q.Clear reconstruction algorithm increases. Referring to the scientific reports, one can see that the signal to noise ratio in the image increases. The effect of the change of the β parameter on the SUV mean value is the largest for the smallest sphere. The percentage decrease is much higher also with the lower values of the activity, reaching a value of 3.7% and 8.5% for large and small sphere with $\beta=450$, in comparison with $\beta=200$. With $\beta=1000$ a very significant decrease is observed, especially for the smallest sphere and for the lowest activity measured, which is 18.5 % when $\beta=200$. **Conclusion:** An increase of the values of the β parameter has an adverse effect on the quantitative assessment of SUV. In the visual assessment, a satisfactory image quality is present with $\beta=450$. This value results in a relatively low decrease of the SUV mean and SUV max.

Presenter: SKÓRKIEWICZ; JAGIELLONIAN UNIVERSITY, POLAND, Konrad

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