Physical and Clinical Evaluation of Standardized Uptake Values CRISTINA LOIS, University of Tennessee, Knoxville, TN, BJOERN W. JAKOBY, University of Surrey, Guildford, UK, KARL HUBNER, University of Tennessee, Knoxville, TN, MARIO CAÑADAS, CIEMAT, Madrid, Spain, DAVID W. TOWNSEND, University of Tennessee, Knoxville, TN — The Standardized Uptake Value (SUV) is often used in positron emission tomography (PET) to differenciate malignant from benign tumors, and to monitor the progress of the patient response to therapy. Despite its name, SUV may depend on both PET scanner hardware and software details, and will depend on the imaging protocol. In this paper, we present a study of the SUV variability according to these external factors. To study the influence of the PET device, phantom studies were performed on two different combined PET/CT scanners. SUVs were obtained using several reconstruction algorithms and different reconstruction matrix sizes. To study the influence of the imaging protocol, patients were injected with 370 MBq of 18F-FDG and scanned at 60 and 90 min post-injection. SUVs were obtained applying several clinical image reconstruction algorithms. Significant differences in SUVs were obtained depending on the PET scanner, reconstruction method, and imaging protocol. It is essential, therefore, to follow a strict protocol in order to reliably compare FDG uptake with SUVs. Our results may have a significant clinical impact in order to provide an unbiased SUV threshold to determine malignancy.

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