

AbstractID: 14309 Title: A New Clinical Utility for Tumor Delineation using SUV of PET images in Treatment Planning

Purpose: The standardized uptake values (SUV) are often used for diagnosis, staging and treatment response assessment of a cancer patient. However, the SUV information is not readily available after the images are imported to a treatment planning system (TPS); in particular, when the imaging system and TPS are from two different manufacturers. To facilitate tumor delineation using SUV, we developed a new tool for use in the Philips Pinnacle TPS.

Method and Materials: The information on the injected dose and time, scan time, patient weight, and the scaling factor that converts the pixel values (in counts) to activity concentration uptake (in Bq/ml) are identified from the DICOM header of a patient's PET data. The SUVs were obtained by multiplying the pixel values with the scaling factor and patient weight, and divided by the activity at scan time. After Pinnacle imports PET images, it generates a new data set with a new scaling factor. Our tool modifies that scaling factor so that the pixel values stored can be directly interpreted as SUVs.

Results: This tool allows the physicians to directly use SUV as threshold for tumor delineation on the PET images. We have tested this tool on the images acquired from GE PET/CT scanners. The tool reads the DICOM headers, therefore it can be applied to the data acquired from other manufacturers. Specific to Pinnacle, we also report on the correct shifts needed when fusing PET/CT data with the planning CT data, or even when the CT in the PET/CT is the planning CT itself, as validated by a point source acquisition.

Conclusion: We have developed a new clinical utility for tumor delineation with SUV in the Pinnacle TPS. Prior to this development, the SUV has to be obtained outside the Pinnacle TPS, adding to the complexity of treatment planning.