

**Purpose:** To investigate the differences of SUV obtained in dual PET-CT using time of flight (TOF) and non-TOF iterative reconstruction.

**Methods:** List mode PET/CT scan of the chest was performed using average of 10 mCi of F-18 FDG at 1 and 2 hour post-injection under fasting condition. The maximum standard uptake value (SUV<sub>max</sub>) was measured in lung cancer during radiation therapy on ungated PET-CT images using TOF and non-TOF iterative reconstruction in a Philips Big Bore PET-CT system. 94 pairs of SUV were measured in TOF and non-TOF PET images obtained at 1 hr after injection and another 94 pairs were measured at 2 hr post-injection. Paired t-tests were used for differences in SUV with cut-off values of <5, <7.5 <10. A p-value <0.05 was considered to be significant.

**Results:** Significant variability of SUV is demonstrated between TOF and non-TOF PET images obtained at 1 and 2-hr post-injection ( $p < 0.0001$  in both time points) (Table attached). Mean and SD non-TOF SUV<sub>1hr</sub> = 8.82 +/- 4.81 and SUV<sub>2hr</sub> = 10.66 +/- 6.02. Mean TOF SUV<sub>1hr</sub> = 8.10 +/- 4.17 and SUV<sub>2hr</sub> = 10.05 +/- 5.31. There were no significant differences for tumor SUV < 5 between TOF and non-TOF measured at 1 or 2 hr (Curve attached). These results were also observed in phantom studies.

**Conclusions:** While image quality may be improved with PET scanners having TOF options, the SUV is in general higher in non-TOF reconstruction due to scatter activity. Recognition of such differences is important when patients are scanned on different PET scanners during the course of their disease.