

Purpose: The objective of this study is to validate the use of GATE Monte Carlo simulations to determine patient-specific dosimetry using quantitative multi-modality imaging. **Method and Materials:** Data acquired with the Symbia™ hybrid SPECT/CT system are reconstructed with Flash-3D™ and corrected for scatter, collimator detector response and attenuation using a CT attenuation correction method. The voxel-based CT model is used with GATE to compute 3D dose distributions from the SPECT data. Validation is performed using both simulated SPECT data and anthropomorphic phantoms. **Results:** Initial validation studies show that GATE, while time consuming, is suitable in dose calculation. **Conclusions:** The approach presented can be used for radionuclide multi-modality dosimetry leading to patient-specific dose calculations for treatment planning.