

AbstractID: 12693 Title: Reduction of CT Field on SPECT-CT Scans: Impact on Patient Dose and Diagnostic Information

Purpose: To evaluate a process for reducing the CT field of view on SPECT-CT scans and assess its impact on the diagnostic value of the resultant scan interpretation.

Method and Materials: 529 prescribed SPECT-CT scans were evaluated. The physician determined if the CT field could be reduced by review of the initial planar and SPECT images. 309 met the physician criteria for CT reduction. The CT techniques were recorded before and after the field reduction. The CT automatic exposure control was used on all scans. The interpreting physician completed a data form indicating clinical information CT added or omitted. Effective doses were estimated using the ImPACT CT Patient Dosimetry Calculator for both the full and limited CT. Radiopharmaceutical effective doses were estimated based on MIRD methodology.

Results: 95.5% (295/309) of the limited studies had a reduction in the CT effective dose. The mean full CT effective dose was 2.99mSv (+/- 1.38) per patient. The mean limited CT effective dose was statistically less ($p<0.001$) at 1.81mSv (+/- 1.28). This calculated to a mean decrease of 1.19mSv (42.5%) with a maximum 4.78mSv reduction. The average decrease in total effective dose was 13.6%. There was no effective dose change in 8 and a slight increase (max of 0.3mSv) in 6 studies. 174 (56.3%) reduced fields eliminated a radiation sensitive organ such as the thyroid, cornea, gonads or breast. 31 CT scans revealed incidental findings. Physicians indicated in 232 cases the CT allowed them to make a more accurate anatomical identification of the physiological process than SPECT alone. There were 5 cases that the reduction omitted anatomical information that could have been helpful.

Conclusion: Over half of the SPECT-CT studies were performed with a limited CT field of view, reducing the patient's exposure, yet maintaining diagnostic information and quality of interpretation.