COMPUTED TOMOGRAPHY SIMULATION IMAGE QUALITY AND NOISE MEASUREMENT

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Purpose: To measure and evaluate the spatial resolution, contrast resolution and noise of computed tomography simulation image in order to meet the requirement of precision radiation therapy.

Materials and methods: Elscint HeliCAT II CT scanner head and body phantom were used to measure and evaluate the image quality of computed tomography simulator. We used the head phantom includes seven rows of different diameter perspex layer (multipin layer) to do the spatial resolution comparisons, and another five different material layer of this head phantom were also used to do the contrast resolution comparisons. The noise was used the head and body phantom through the "ROI" function key to find its percentage errors in order to meet the requirement of precision radiation therapy.

Results: The error of spatial resolution was within ± 0.8 mm. The Contrast resolution error was within ± 18 CT number except Teflon. The range of noise was within 3%.

Conclusions: The quality assurance procedure of this computed tomography simulation imaging system had been setup before formally using. It all met the requirement of precision radiation therapy. To assure the image quality, it also needs measurement periodically.

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Key words: Computed tomography simulation, Spatial resolution, Contrast resolution, Noise