

Purpose: The study was carried out to find optimal scanning parameters for an MDCT at Ramathibodi hospital.

Method and materials: Two types of phantom were employed to assess image quality and standard ionization chamber was used to measure radiation dose. Tube current, slice thickness, pixel size and pitch were varied from routine techniques to evaluate factors affecting image quality (spatial resolution, contrast detectability and image noise) and dose ($CTDI_{air}$) with aim of optimization.

Results: From our study showed that, optimization of radiation dose and image quality could be achieved by proper selection of scanning parameters. Reduction of tube current could be made 22 - 28%, pitch could be doubled from 0.75 to 1.5 (50% dose reduction) in slice thickness less than 7.5 mm without any significant effects on noise and contrast. In examinations that do not require high spatial resolution, larger pixel size could be made and could result in 15 - 17% dose reduction.

Conclusions: We concluded from our study that, optimal scanning parameters were 115, 105, 150 and 170 mA for head (above/below posterior fossa) and abdomen (pre- and post- contrast) protocols, respectively. Slice thickness should be made thinnest possible before the penumbra dose penalty becomes significant. Pitch and pixel size should be selected based on clinical requirements.