CHAPTER VII

CONCLUSION

The original purpose of this study was to assess radiation doses of Siemens Sensation 4 and 16 MDCT scanner during CT examination. Measurements and calculation of the radiation doses from two MDCT scanners were collected both from various protocol parameters so the data were compared with Sensation 4 and 16. The results present the difference between two scanners. With tube voltage and tube current constant, the average radiation dose in patients who need MDCT scanning for head and neck examination from Siemens Sensation 16 is not more than the dose from Siemens Sensation 4.

The radiation doses, that measured from Siemens Sensation 4 are significantly higher than Siemens Sensation 16, this difference between two MDCT scanners should be accounted for in scanner generation, and geometry. The higher mAs associated with the use of thinner slices, the number of scan series performed.

Look for the radiation dose from our routine protocol, in sequential mode, the radiation dose of Siemens Sensation 16 (120 kV, 320 mAs slice collimation 12x0.75 mm) was 66.36 mGy, and higher than Sensation 4(120 kV, 260 mAs, slice collimation 4x1 mm), 60.24 mGy. This is a result from the different in using effective mAs, Sensation 16 using higher effective mAs than Sensation 4.

Furthermore, there is still no consensus about optimal dose for clinical examination CT protocols. Mostly, tube currents are chosen arbitrarily without assessing impact on image quality and lesion detectability. In our opinion, modern MDCT scanners have the potential to offer adequate image quality with moderate radiation dose for the majority of clinical protocols. For estimating the necessary radiation exposure of patients it is essential to measure dose (*e.g.* $CTDI_w$ and DLP) and obtain images for quality assessment according to the clinical protocols actually used at the scanner concerned.

As anticipated, our study shows that differences in radiation dose did not result primarily from differences in scanner technology but were mainly caused by specific parameters. CT manufacturers, adjust their clinical examination parameters clearly to lower tube currents, but these are often changed by radiologists and technicians according to their needs. The

exact scan protocol used in each scanner will depend on the type of CT scanner and the individual preferences of the radiologist. The quality criteria guidelines may be helpful in determining optimal parameters.

As CT examinations cause a relatively high radiation burden to the patient, it is desirable that patient dose as well as referral criteria be optimized. Also, clinical protocols need to be applied according to the individual patient's indication.