UNIVERSITI TEKNOLOGI MARA

THE EFFECT OF VARYING KILOVOLTAGE (kVp) AND TUBE CURRENT (mAs) ON THE IMAGE QUALITY AND DOSE OF CTA HEAD PHANTOM

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CONFIRMATION BY PANEL OF EXAMINERS

I certify that a Panel of Examiners has met on 5th December 2014 to conduct the final examination of Sity Noor Ayseah Binti Dzulkafli on her Master of Health Sciences thesis entitled "The Effect of Varying Kilovoltage (kVp) and Tube Current (mAs) on The Image Quality and Dose of CTA Head Phantom" in accordance with Universiti Teknologi MARA Act 1976 (Akta 173). The Panel of Examiners recommends that the student be awarded the relevant degree. The panel of Examiners was as follows:

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of the Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other institution or non-academic institution for any other degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

In this study, the effects of kilovoltages (kVp) and tube currents (mAs) on Computed Tomography Angiography (CTA) head phantom images were investigated quantitavely using ImageJ software due to insufficient understanding on the relationship between these parameters on CT image quality and doses. The objective of this study is to investigate the effect of kilovoltages (kVp) and tube current (mAs) parameters quantitatively on several parameters namely; 1) image quality 2) dose 3) Signal to Noise Ratio (SNR) and 4) contrast. The parameters have been varied during the CT scan examination and the results have been compared for each kilovoltages (kVp) and tube currents (mAs) using ImageJ software. In brief, varying the kilovoltages (kVp) and tube current (mAs) will enhance the image quality but will also increase the dose exposure to the patient. Higher doses are one of the problems that researchers have to overcome in patient diagnosis in order to have an optimum image quality with lower doses. The results include the relationship between the parameters and image quality and also dose in selected type or arteries; Anterior Cerebral Artery (ACA), Middle Cerebral Artery (MCA) and Internal Carotid Artery (ICA) in CTA. Decreasing kVp do increase image contrasts while increasing mAs play roles in reducing the noise of the image. Finally, the suggested parameters used for brain examination is 100 kVp with 360 mAs in line with the recommended CTDIvol dose value as in Computed Tomography European Guidelines.

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