

Measurement of radiation dose in intra-oral radiography in Vajira Hospital

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Abstract

Measurement of incident air kerma ($K_{a,r}$) without a patient is used as a radiation dose in dental radiography. These radiation doses are the diagnostic reference levels (DRLs) in intra-oral radiography in Vajira Hospital. A dose meter is used to measure incident air kerma from intra-oral radiography. Radiation doses were collected from three different teeth: incisor, premolar, and molar from upper and lower jaw. The radiation dose was also measured from bitewing technique. The exposure techniques from those examinations were recorded. The results showed that the radiation dose of upper- and lower-jaw were slightly different. From the upper jaw, the radiation dose of incisor, premolar, and molar were 0.4 mGy, 0.5 mGy, and 0.7 mGy, respectively. From lower jaw, the radiation dose of incisor, premolar, and molar were 0.3 mGy, 0.4 mGy, and 0.5 mGy, respectively. The radiation dose of bitewing technique was 0.9 mGy. The intra-oral DRLs of this study were lower than Thai national DRLs by Department of Medical Science (DMSC). The different of radiation dose might be from the factors of imaging system, age of the machine, brand, model, exposure techniques, generator, etc. ALARA's optimization principles could be applied by reducing exposure techniques while maintaining the quality of image. The optimization is important in ensuring the proper use of the radiation dose to the patient. DRLs should be inspected every 2-3 years.

Keywords: incident air kerma, diagnostic reference levels (DRLs), intra-oral radiography