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Establishing Local Diagnostic Reference Level for Paediatric Fluoroscopic Examination in Micturating Cystourethrography

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Introduction: Micturating Cystourethrography (MCUG) is a common procedure performed in pediatrics. This procedure is associated with high radiation dose due to continuous screening to the patients. Therefore, dose optimisation is very important as their developing organs and tissues are more sensitive compared to an adult. However, Malaysia has not yet established the DRLs for MCUG procedure. **Methods:** In this retrospective study, a total of 93 samples data from patients' age of 5 years old and below were retrieved from March 2018 until March 2022 from a tertiary hospital in Kuala Lumpur. The group of patients were divided into two which are (< 1 year) old and between 1-5 years old. Dose value, Air Kerma-Area Product (KAP) was measured using a KAP meter build in fluoroscopy machine. Reference level is set at 75th percentile value and calculated for each group. An independent sample t-test was used, and the statistical significance level was set at $P < .05$. **Results:** The result is a statistically significant difference ($P = 0.012$) of KAP between the (< 1 year) old and the 1-5 years old. While, finding in fluoroscopic screening time shows there was no statistically significant difference ($P = 0.080$). The local diagnostic reference level (LDRL) for first age group (< 1 year) was 0.016 $mGy.\ m^2$ and shows 3 times lower than second age group (1 – 5 years), 0.040 $mGy.\ m^2$. **Conclusions:** This study found that LDRL helped in the optimisation of radiation dose and enabled best practices by giving feedback to the healthcare professionals.

Keywords: Air Kerma-Area Product (KAP), Diagnostic Reference Levels (DRLs), fluoroscopy, micturating cystourethrography (MCUG), pediatric