

Purpose: The purpose of this study is to survey the image quality and patient doses for CT in Taiwan.

Methods and Materials: Dedicated researchers conducted on-site measurements, started from March 2009 to September 2010. An ACR CT accreditation phantom (Model 464, Gammex) was used to evaluate CT image quality, including slice thickness accuracy, CT number accuracy, uniformity, noise, artifact, spatial resolution, and low contrast detectability. CT dose index (CTDI) was measured by a pencil-type ionization chamber (10X6-3CT, Radcal) inserted into head and body dosimetry phantoms. Representative patient doses for adult head, adult abdomen, and 5-years pediatric abdomen examinations were evaluated according to clinical setting and on-site measured data, including volume CTDI (CTDI_{vol}), dose-length product (DLP), and effective doses. The diagnostic reference levels for CTDI_{vol} were set at the third quartile from the survey results. The criteria of pass or fail were according to ACR CT accreditation.

Results: There are 446 CT scanners, including CT, PET/CT, SPECT/CT, and CT simulator, in 234 hospitals in Taiwan. The survey, which was conducted from March 2009 to September 2010, included 426 units in 226 hospitals (96% completed). The fail rates of each item of image quality ranged from less than 1% to around 80%. The mean value and third quartile value of CTDI_{vol} are 53 and 68 mGy for adult head examinations, 18 and 18 mGy for adult abdomen examinations, and 17 and 28 mGy for 5-years pediatric abdomen examinations.

Conclusion: The results have compared with ACR CT accreditation and gave us a view of current level of CT image quality and patient doses in Taiwan.