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Application of dose-area product compared with three other dosimetric quantities used to estimate patient effective dose in diagnostic radiology

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Abstract

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Background: Application of dose-area product (DAP) quantity has been increased in the clinical practice. DAP is relatively easy to measure, and has been shown to correlate well with the total energy to the effective dose imparted to the patient correlated. Materials and Methods: Measurements of DAP were carried out with 421 adult patients who underwent conventional radiological examinations. Then, some useful dosimetric quantities such as exposure area product (EAP), air kerma and entrance surface dose (ESD) were estimated. Furthermore, effective doses were computed by the measurement of DAP and corresponding conversion factors. Results: The effective dose values derived from various methods are in good agreement. The mean effective dose estimated from DAP measurements were 0.13, 0.42, 0.05, 0.59, 0.54 and 0.03 mSv/projection for chest, abdomen, cervical spine, lumbar spine, pelvis and skull examinations, respectively. Conclusion: Indirect effective dose determination using the NRPB dosimetric data and the measured value of DAP or ESD allows for reliable estimates of effective dose. The ODS-60 software was used in this study as to it's flexibility to manipulate the technical parameters of an examination and patient's parameters.

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Author keywords

DAP; Diagnostic radiology; Effective doses

Indexed Keywords

EMTREE medical terms: adult; article; computer program; correlation analysis; dosimetry; female; human; major clinical study; male; quantitative analysis; radiation dose; radiation dose distribution; radiation exposure; radiation response; radiodiagnosis; reliability

Device tradename: ODS-60, Rados, Finland.

Manufacturers:Device manufacturer: Rados, Finland;Shimadzu;Siemens.

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