Performance Evaluation of a cilindrical ionization chamber used in radiation protection measurements of diagnostic radiology clinical systems.

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The use of ionizing radiation for medical purposes was a major advance for society due to the various possibilities of use for treatment and diagnosis of diseases. On the other hand, knowledge about the damage caused by the biological effects of radiation requires the quality control of diagnostic radiology equipmenst. Radiation detectors are used to measure the radiation levels emitted by medical diagnostic radiology equipment.

For practicality and precision, among the most commonly used detectors are the ionization chambers (I.C). In Brazil, according to current legislation [1], the instruments for measuring radiation levels in radiometric surveys and beam dosimetry at diagnostic radiology sistems should be calibrated every two years by the Calibration Laboratories traceable to the national or international metrology network ionizing radiation, in the qualities of diagnostic X-ray beams.

The objective of this work was to evaluate the performance of a cilindricalionization chamber used in radiation protection measurementes in diagnostic radiology equipments, considering that the calibration geometry differs from that in which the ionization chamber is routinely submitted to routine clinical measurements. For this, radiometric survey tests were performed, using several variations of measurement parameters such as: temperature and humidity, to simulate the geometry of field measurements. The results obtained showed a variation of 5% with those provided by the manufacturer.

Keywords: Diagnostic Radiology ; Radiation protection, Calibration; Ionization chamber

[1] Portaria 453 do ministério da saúde – Diretrizes de proteção radiológica em radiodiagnóstico médico e odontológico, 1998.