CALIBRATION OF CLINICAL DOSEMETERS IN THE IAEA WATER PHANTOM

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The procedures recommended by the IAEA Code of Practice were applied at the Calibration Laboratory of São Paulo in order to provide in the future the clinical dosemeters users with absorbed dose to water calibration factors for ^{60}Co radiation beams. In this work the clinical dosemeters were calibrated free in air and in water, and the results were compared, using conversion factors. The secondary standard dosemeter consists of an ionization chamber (NE model 2561), an electrometer (NE model 2560) and a radioactive check source (NE 2562). Its calibration factors are given in terms of exposure in air (NPL). This system participates annually of the national intercomparisons organized by the Brazilian Secondary Standard Dosimetry Laboratory (SSDL Rio de Janeiro). The experiments were all performed in ^{60}Co radiation beams (12 TBq) and the substitution technique was applied. The several tested clinical dosemeters of different manufacturers and models belong to the laboratory and to hospitals. For the measurements in water the IAEA cubic water phantom was used. The dosemeters were all calibrated free in air in terms of air kerma, and the calibration factors in terms of absorbed dose to water were obtained through conversion factors. The same dosemeters were also calibrated into the water phantom. Good agreement was found between the two methods; the differences were always less than 0.5%. The data obtained during this work show that when the dosemeters are used only in ^{60}Co radiation and the users apply in the hospital routine work the IAEA Code of Practice, the calibration can be performed directly in the water phantom. This procedure provides the useful calibration factors in terms of absorbed dose to water.

Work partially supported by CNPq - Conselho Nacional de Desenvolvimento Científico e Tecnológico, Brazil

Abstract