

TESTING THE NEW AAPM FORMALISM FOR THE EVALUATION OF RADIATION DOSE IN X-RAY COMPUTED TOMOGRAPHY

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Abstract – A standardized way to characterize the radiation dose in computed tomography (CT) is to measure the Computed Tomography Dose Index (CTDI). There are several definitions of CTDI which appeared during the course of the CT development. AAPM has recently issued a report no. 96 dealing with the measurement, reporting and management of the radiation dose in CT. But during the last decade negative sides of CTDI appeared and in February 2010 AAPM issued another protocol for stating and measuring the radiation dose in CT, quite different from the previous one. In this work we compare measurements in air with two different protocols, one of the IAEA (Technical Report Series no. 457) and the other protocol based on the AAPM report no. 111. The dose difference on the central CT axis between the measurements with these protocols was less than 2%. Also, the peripheral doses in the field of view were in the uncertainty boundaries characteristic for dosimetric measurements in diagnostic radiology. The AAPM report no. 111 replaces the longtime used CTDI formalism with the one in which measurement of equilibrium dose-pitch product can be obtained with a Farmer type ionization chamber. The new measurement formalism can be used to state the radiation output of a CT unit as well as to predict some future malfunction of that unit.