

The Investigation of Tissue Surrogate Materials for a Radiology Phantom: A Review from Dosimetry Perspective

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In radiological research is there an essential to develop a phantom consisting tissue surrogate materials. A phantom study approximately indicates the realistic condition for both a clinical study and a quality control program. This paper was conducted to provide the dosimetry perspective for investigating the material candidate as the tissue-equivalent supported by recent studies of the radiology phantom constructions. Since 1906, there have been studies in developing tissue-equivalent materials. Initially from water and its equivalent, decades reported some phantoms constructed by wax-based, polymeric and organic materials. Some radiologic properties based on the attenuation characteristics like the elemental compositions, physical density (mass density), electron density, atomic effective number (Zeff), and linear attenuation of the radiation are considered to characterize the material. The stoichiometric method and Dual-energy Computed Tomography (DECT) were recently investigated to provide more accurate quantification in assessing the properties of tissue surrogate candidates. The development of phantom and its dosimetry properties are potential more studies to provide radiologic study more accurate.

Biography

Intan A. S. Muminah has enrolled in the graduate master program of Physics (Medical Physics) at Department of Physics, Faculty of Mathematics and Sciences, University of Indonesia. She also works as the laboratory assistant at Medical Physics and Biophysics Laboratory with respect to hand-on the dosimetry experiment. Currently, she has conducted a research in the field of nuclear medicine.

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