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Review of abdominal MRI

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The goal of this presentation is to teach the concepts of abdominal MRI to nuclear medicine physicians. Initial part of the talk will discuss identification and use of various MRI sequences in abdominal MRI. Subsequently, a case based approach will be used to identify and discuss the MRI imaging findings and differential diagnosis of various pathologies involving abdominal organs. This lecture is meant for nuclear medicine physicians who want to learn about abdominal MRI. I recently presented this lecture at the CT and MR Case Based Course during the Society of Nuclear Medicine and Molecular Imaging Annual Meeting at Baltimore, MD June 11-15, 2015.

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Microdosimetry of energetic charged particle beam using a developed wall-less tissue-equivalent proportional counter

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Deposit energy distribution in a microscopic site is basic information for understanding of biological effects of charged particle beams. In microdosimetry, lineal energy (y) is defined as a physical index of energy deposition that can express each energy deposition in a micrometer scale of a human body. The tissue equivalent proportional counter (TEPC) is an instrument that can simulatively measure ' y ' distribution in a human tissue using a tissue equivalent gas. For dose measurements in particle cancer therapy or space mission, human body is exposed to energetic charged particles that produce secondary radiations that have different biological effects. Hence, to evaluate the dose from such energetic charged particles, the ' y ' distributions [$yf(y)$] should be obtained including not only the contribution of the primary but also the secondary particles that produced along the incident beam track. The TEPC developed in this study (wall-less TEPC) has a nearly see through detection part made of thin wires to perform the measurements of $yf(y)$ distributions for kinds of charged particles such as proton and iron with kinetic energy up to ~ 500 MeV/u. Radial dependence of $yf(y)$ distributions was also experimentally evaluated for proton, carbon and iron beams. The author will review a series of measured data, as well as the Monte Carlo simulation in micrometer scale using the Particle and heavy ion transport code system (PHITS) that a calculation model of $yf(y)$ distribution is incorporated.

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