Background and Objective: Clyndrical ionization chamber is used for measurements of patient dose in radiation therapy. Therefore, determination of its effective point of measurement in finding dose distribution in tumor volume is important.

Methods: In this study a CC13 ionization chamber is used for dose measurement of 6 and 18 photon beams of Variant accelerator in different field sizes, 5*5 cm2 up to 35*35cm2. Measuremets is done in blue phantom, up to 5cm depth and data fit software is used for evaluation of experimental datas.

Results: PDD curves ara plotted seperatly for all treatment photon fields. Critical points of these curves is calculated and considered as displacement perturbation factor (Pdis)

Conclusion: The first critical point of each curve is caused by changing environment from air to water (phantom) during measuring of ionization. In fact we can consider critical point as effective point of measurement of ionization chamber. Consideration shows that any increasing in field size, decrease and increasing of energy increase the depth of this critical point.

Keywords: Effective point of measurement, clyndrical ionization chamber, Percent Depth Ddose curves

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P18: Which Body Model Is More Suitable for Dosimetry Calculations?

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Abstract

Computational phantom(three dimension computer models of human body) are essential in estimating organ doses from various occupational radiation exposures and medical procedures. Mathematical phantoms use mathematical equations to describe the organs and tissues of human body and voxel phantoms are human models based on CT or MRI obtained from high resolution continuous scans of a single individual. Voxel phantoms are exactly matches with individual so obtained results on these phantoms are accurate while mathematical phantoms are most general and covering a range of age.

In this study were investigated the effect of phantom type on neutron absorbed doses and neutron effective doses. For this aim, we compared the calculated results on ORNL adult phantom (Mathematical phantom) with VIPMAN (voxel phantom) for absorbed doses on 26 organs in monoenergetic neutron beams under six irradiation conditions: AP-PA-RLAT-LLAT-ROT and ISO. In addition, the obtained effective dose results compared with Asian voxel phantoms: TARO and HANAKO and also VIPMAN for whole body. MCNPX Monte Carlo code was used for this simulation.

The results of this study indicates that influence of phantom type (mathematical or voxel models) are not important on the absorbed dose and the effective dose values. But the size of the phantom (VIPMAN versus ORNL) significantly affected on absorbed and effective doses in all irradiation geometries. These results are important because working with mathematical phantoms is simpler and much easier than the complex voxel phantoms.

Keywords: Mathematical phantom, Voxel phantom, Monte Carlo Code, Effective dose

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P19: Reducing the Effective Dose Equivalent on 5 Year-Old ORNL Phantom by the Use of Γ-Shields on in Vivo BCA Facility

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