

## Absorbed Dose Measurements for Teletherapy Prediction of Superficial Dose Using Halcyon Linear Accelerator

**Authors :** Raymond Limen Njinga, Adeneye Samuel Olaolu, Akinyode Ojumoola Ajimo

**Abstract :** Introduction: Measurement of entrance dose and dose at different depths is essential to avoid overdose and underdose of patients. The aim of this study is to verify the variation in the absorbed dose using a water-equivalent material. Materials and Methods: The plastic phantom was arranged on the couch of the halcyon linear accelerator by Varian, with the farmer ionization chamber inserted and connected to the electrometer. The image of the setup was taken using the High-Quality Single 1280x1280x16 higher on the service mode to check the alignment with the isocenter. The beam quality  $TPR_{20,10}$  (Tissue phantom ratio) was done to check the beam quality of the machine at a field size of 10 cm x 10 cm. The calibration was done using SAD type set-up at a depth of 5 cm. This process was repeated for ten consecutive weeks, and the values were recorded. Results: The results of the beam output for the teletherapy machine were satisfactory and accepted in comparison with the commissioned measurement of 0.62. The beam quality  $TPR_{20,10}$  (Tissue phantom ratio) was reasonable with respect to the beam quality of the machine at a field size of 10 cm x 10 cm. Conclusion: The results of the beam quality and the absorbed dose rate showed a good consistency over the period of ten weeks with the commissioned measurement value.

**Keywords :** linear accelerator, absorbed dose rate, isocenter, phantom, ionization chamber

**Conference Title :** ICBMP 2024 : International Conference on Biophysics and Medical Physics

**Conference Location :** New York, United States

**Conference Dates :** July 11-12, 2024