

ABSTRACT

External radiotherapy is a common treatment technique for cancer. It has been shown that radiation therapy is a both clinically and economically effective treatment for many types of cancer, even though the equipment is expensive. The technology is in constant evolution and more and more sophisticated and complex techniques are introduced. One of the main tasks for physicists at a radiotherapy department is quality control, i.e. making sure that the treatments are delivered in accordance with the dosimetric intentions. Over dosage of radiation can lead to severe side effects, while under dosage reduces the probability for patient cure. The main purpose of this study was to verify the accuracy of the dosimetry of the 6 MV photon beam in the PlanW2000 Radiotherapy Treatment Planning System of National Cancer Institute, Wad Medani, Sudan. experiments was setup to verify the treatment planning system for 6 MV photon beam in three phase: point dose verification, profiles curve verification and PDDs curves verification. The point dose verification in the homogeneous phantom generated by the PlanW2000 Treatment planning system for the open and wedge fields for 6 MV were compared with the values obtained by a scanning system, PTW computerize water scanning System. The absorbed dose at the prescribed point calculated by the planning system was verified by comparison with the measured dose at the normalization point using a PTW 31013 farmer ionization chamber in a water phantom, which is the technique used in patient treatment. The PDDs and Profiles were generated in a homogeneous Phantom by the PlanW2000 for the open field and wedge field, this curves were verified by comparison with the measured curves using PTW 31010 cylindrical Chamber the results for the dose distribution in the homogeneous phantom were found in the acceptable limits ($\pm 5\%$) with the different values within $\pm 2\%$. For dose point verification, the differences were found to be within $\pm 0.6\%$ for open fields, and within $\pm 4\%$ for wedged fields. These results show the applicability of using the PlanW2000 Treatment planning system for patient treated with the Varian Linear Accelerator.