Acceptance Testing and Measurements of Intensity Modulated Radiation Therapy(IMRT) Device

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The IMRT treatment delivery is performed at our center using a multileaf collimator called “Mimic” installed on a Clinac2300CD linear accelerator. The intensity profiles and treatment plans are generated by using a “Corvus” treatment planning computer. This paper presents the acceptance testing and treatment plan verification of the device. The test consists of alignment of the Mimic collimator, slice width determination and beam data acquisition. The absolute doses delivered to the target volume in phantoms (Nomos Box and Rando man) using the computer calculated IMRT plan is verified using TLD measurements and dose distributions are verified using film scanning. The results of the test proved that the calibration discrepancies between measured and computer calculated values obtained were 1.022+/-0.03 for an auditory canal tumor using 4 arcs at 1.7 cm radiation width per arc slice , 1.027+/-0.008 for prostate using 4 arcs at 3.7 cm radiation width verified inside a Rando pelvis phantom for 290 degree arc at 3.7 cm radiation width and 0.994+/-0.036 for an arbitrary target, using 210deg arc using 4 arcs at 1.7 cm slice width on a Nomos box phantom. On comparison the measured and the Corvus calculated isodose envelopes fell within 2 to 3 mm discrepancy for 90 % isodose. The dose volume histograms and practical planning strategies that are encountered in an IMRT procedure are presented.