Comparison of two ionization chamber used absolute dose for intensity modulated radiotherapy of prostate quality assurance

P.J. Cecilia 1, J. Da Cruz 2, L. Rodrigues 2, A. Santos 2, L. Martins 2, L. Capnogli 1
1 Albert Einstein Hospital, Radiation Therapy, Sao Paulo, Brazil
2 Instituto de Pesquisas Energéticas e Nucleares, Dosimetry, Sao Paulo, Brazil

Introduction: The use of intensity modulated radiotherapy (IMRT) for patients with prostate cancer treated at Albert Einstein Hospital-SP, started in August 2001. As a treatment planning quality assurance (QA) protocol, all plans were validated by ionization chamber (IC) and film dosimetry in a phantom before the course of the radiotherapy.

Objective: The present work will analyze the results of measured and calculated absolute doses for 100 prostate IMRT plans using two different ICs models and volumes.

Description: The patients plan parameters are exported to a CT scanned phantom with the IC centralized in the field central axis at 10.0cm depth in the phantom. The normalized dose was in the median dose inside the IC volume. During 3 years 249 prostate plans were checked in terms of absolute dose for intensity modulated radiotherapy of prostate quality assurance.

Results: The average and the maximum deviation of the measurements were 198.82cGy ± 2.28% for PTW23333 and 199.74cGy ± 2.45% for RK083 (both with prescription dose of 198cGy). When the measured and TPS dose were compared the maximum deviation resulted in 3.23% and 1.36.

Conclusion: The absolute absorbed dose measurement for IMRT is necessary for plan approval of the treatment to verify the individual fluences. Inverse planning optimization. The use of regular clinical ICs and solid-water phantom is satisfactory for prostate IMRT dosimetry. The prostate IMRT fields have sufficient geometry and low gradient to use the ICs of 0.6cc or 0.12cc volumes. For measurements in small fields or high gradient dose regions, ICs with smaller volumes are recommended.