EXAMINATION OF IN-AIR DOSE DISTRIBUTION AROUND PHYSICAL WEDGES

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Aim: In our work we have examined the dose distributions around the physical wedges of the Varian TrueBeam linear accelerator and the Theratron 780E cobalt unit that generate after irradiation.
Methods: The measurements were carried out with 2 Gy dose for open field and wedged field of 15, 30, 45 and 60 degrees. The measurements on the linear accelerator were done after 6, 10 and 18 MV photon energy irradiation and for the cobalt unit with the average energy of 1,24 MeV. We have chosen these two devices so that we could gain information about the most out-of-date and the most modern devices in radiotherapy. The measurements were done directly under the wedges in air with the Victoreen 451P ionization chamber.
Results: In the case of the different wedge angles of the linear accelerator (0°/ 15°/30°/45°/60°) we measured the following results: 6 MV (10,3/9,0/4,3/4,8/3,3) µSv/h, 10 MV (12,5/10,7/4,0/6,6/3,2)µSv/h, while 18 MV(15,2/12,5/ 11,4/ 9,5/8,1)µSv/h. Under the wedges of the cobalt unit we measured (1,32/0,86/1,46/ 1,12/1,29) µSv/h dose rates.
Conclusion: The dose distribution under the wedges of the cobalt unit did not show dependence on the width of the wedges. The activation reaction of the linear accelerator wedges showed great dependence on the width of the wedge and the energy of the photon beams. In order to minimalize the hand dose of the operating staff, it is recommended to apply virtual wedges instead of physical wedges where it is not necessary to pursue manual activity.