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SSD (source to skin/surface distance) and energy using electron beam depth dose (DD); four linear accelerator observation

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6MeV, 9MeV, 12MeV, 15MeV & 18MeV electron beams from a linear accelerator (Model: Clinac 2100C, 2100CD & 2100CD; Manufacturer: Varian Medical Systems International AG) in National Institute of Cancer Research & Hospital (NICRH), Mohakhali, Dhaka, Bangladesh. The DD curves of above mentioned electron beam for field size 10×10cm2, 15X15cm2, 20X20cm2 and other SSD ranging from 98 to 120cm at a step of + 2cm are obtained using water medium. The objective of this study was to find the effect of varying SSD on tumor dose and surface dose. Although electron beam therapy is used to treat superficial tumors at a standard 100cm SSD, certain clinical situations require the use of non-standard SSD. For example, due to anatomical and pathological reasons, in the case of treatment of the cancer of lung, breast, head & neck, vulva and groin, sometimes 100cm SSD cannot be achieved and higher values of SSD are needed to be set. The influence of these extended SSD ofbeam characteristics ofthe linear accelerator is carried out. As in clinical practice depth of 90% dose of the electron beam is considered, R90 which is the depth of 90% dose is taken as the key parameter in this study. The variation of R90 with SSD and energies has been examined. A total of sixty PDD curves hasbeen obtained. . In these curves, the values of R90 are found to change quadratically with SSD. For 100 cm SSD, the values of R90 are found to be changed linearly as energy changes. In this study other important DD parameters likepractical range of electrons Rp,the dose in 0.5 mm layer of water called surface dose Ds,X-ray background Dx, normalized dose gradient G0=Rp/(Rp-Rq), most probable electron energy at the phantom surface , the mean energy of the electron at the phantom surface are also investigated. A 3D radiation field analysis system controlled by MEPHYSTO MC2 software, a plane parallelionization chamber as a field chamber and a semiflexionization chamber as reference chamber were used for this study. Throughout this work reference condition and guidelines are according to protocols TRS 398, TG 25, TG 51 andTG 106.

Biography

Safiqul Islam completed his Bachelor of Electronics & Telecommunication Engineering and Masters of Business Administration (MBA)at Masters of Business Administration (MBA)AtishDipankar University of Science and Technology. He completed his local and International training on Radiation oncology and Board Imaging.

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