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Investigation of dose distribution for modified Gamma radiation fields in radiotherapy

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When undergoing radiotherapy for cancer, effective treatment requires a high degree of accuracy of measurements. For such situations, experimental checks are desirable. Therefore, the aim of the study was to investigate the effects of rectangular beam with compensators such as wedges and half beam block, which are mostly used in treatments. Special attention was made on the dose variations through the central axis and dose distribution patterns were studied with compensators in position.

The photographic effect of radiation, which has a linear relationship between absorbed dose and optical density, was used to measure the absorbed dose at any point in the irradiated area. A special type of verification films was used as the dosimeter. The optical density measurements were taken by Digital Optical Densitometer. Film exposing and developing were carried out at Karapitiya hospital and the density checking was done at National cancer institute, Maharagama.

Slanted dose distribution patterns were obtained with the use of wedge filters. The highest absorbed dose was shifted away from the central axis due to the half beam block. When, wedge and half beam block were used together, the beam tilting and the shifting of maximum value were obtained.

Those results were identified as a useful gain in future treatment planning of cancer therapy. At present these beam modifications have been used in treatments at Karapitiya Teaching Hospital.

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