

AbstractID: 6752 Title: Assessing the reliability of film and semiconductor detector in measurement of central axis depth dose of electron beams.

Purpose: To investigate the possibility of using the Kodak X-Omat V film for the central axis depth-dose measurements of electron beams.

Method and materials: The X-Omat V films were exposed in a MED-TEC film phantom cassette with parallel orientation to produce central axis depth dose curves. These film data were compared with the measured percentage depth dose curves by using a Scanditronix scanning water phantom with both RK ion chamber and electron diode. Measurements were made at a source to surface distance (SSD) of 100 cm for the electron energies between 6 and 20 MeV on a Varian Clinac 2100C linear accelerator for field sizes of $6 \times 6 \text{ cm}^2$ to $20 \times 20 \text{ cm}^2$.

Results: The comparison of the central axis depth dose parameters, R_{100} , R_{90} , R_{50} , and R_P measured by the film and diode with respect to the IC's values showed that the difference did not indicate the dependence either on the energy or cone size. In the buildup region, the film presented higher percent depth dose values for most energies and cone sizes but beyond the depth of maximum dose (R_{100}), the results were opposite. The difference of every parameter for both film and diode was within the acceptable value of $\pm 2 \text{ mm}$.

Conclusions: The ionization chamber and diode measurements appear to be more reliable than the film measurements, but film is particularly useful for new electron cutout data where access to accelerator beam time is limited.