

AbstractID: 1272 Title: Accurately Extracting Dosimetry Information from EDR2 Film Exposed to Electron Beams

The response of EDR2 film to photons in the megavoltage energy range has been extensively characterized in the literature. In this study, we analyze the response of EDR2 film to electron beams in the clinically useful energy range. Sensitometric curves were measured for various nominal electron beam energies with films placed at several depths in phantom. Inconsistencies in the response of the film were found. For example, the slopes of H&D curves obtained at 6 cm depth for an incident 20 MeV beam energy and 2 cm depth for an incident 12 MeV beam energy differed by 4%. One would expect identical response, as the average energy of the electrons at the film depth in both cases would be 8 MeV. It is very likely that in the case of the nominal 12 MeV electrons, a greater fraction of the low energy bremsstrahlung contamination photons penetrate to the film than in the case of the 20 MeV nominal beam. Similar results were found for other nominal energy/depth of measurement combinations. To study this effect further, H&D curves were obtained for low kilovoltage photon beams (30 kVp to 150 kVp) and compared to those of megavoltage photon and electron beams. As expected, an increase in film response was seen with a decrease in the photon energy. An analytical approach to accurately extracting electron beam dosimetry information from EDR2 films will be presented. This procedure corrects for the apparent dependence of electron beam H&D curves on the depth of measurement.