AbstractID: 9111 Title: The response of Kodak EDR2 film in high-energy electron beams

Kodak XV2 film has been a key dosimeter in radiation therapy for many years. The advantages of the recently introduced Kodak EDR2 film for photon beam dosimetry has been the focus of several IMRT verification dosimetry publications. However, no description of this film's response to electron beams exists in the literature. We initiated a study to characterize the response and utility of this film for electron beam dosimetry. We exposed a series of EDR2 films to 6, 9, 12, 16, and 20 MeV electrons in addition to 6 and 18 MV x rays to develop standard characteristic curves. The linac was first calibrated to ensure that the delivered dose was known accurately. All irradiations were done at dmax in polystyrene for both photons and electrons, all films were from the same batch, and were developed at the same time. We also exposed the EDR2 films in a solid water phantom to produce central axis depth dose curves. These data were compared against percent depth dose curves measured in a water phantom using an IC-10 ion chamber.

The response of this film was the same for both 6 and 18 MV x rays, but showed an apparent energy-dependent enhancement for electron beams. The response of the film also increased with increasing electron energy. This caused the percent depth dose curves using film to be shifted towards the surface compared to the ion chamber data. Methods of correcting for this electron energy related response will be presented.