AbstractID: 1112 Title: Evaluation of a Computed Radiography system for megavoltage beam dosimetry

Computed Radiography (CR) systems have been gaining adoption as digital replacements for film for diagnostic and therapy imaging. As a result, film processors are being removed from service, leaving a void for the medical physicists who use film and processors for 2-dimensional megavoltage beam dosimetry. This is the first report to evaluate the ability of a commercial CR reader and storage phosphor plate system (Eastman Kodak Company) to accurately quantitate absolute dose and dose distributions from a 6 MeV linear accelerator. There are potential advantages and disadvantages of current CR systems compared to film systems. CR systems inherently produce a linear dose-response over several logs of dose. However, the barium in the storage phosphor has a higher atomic number than the silver in film, resulting in significant energy sensitivity. The purpose of this work is to fully characterize these and other features of this CR system relevant to dosimetry. The tests performed and reported on in this study include uniformity of readout across a uniform field, geometrical accuracy, intra- and inter-day reproducibility, variation of sensitivity between plates, signal decay over time, dose-to-signal calibration, perpendicular and parallel calibration results, field size and depth of measurement affects and the use of lead filters to minimize them, and routine quality assurance test results compared to that for film. Practical techniques to use and pitfalls to avoid to optimize the accuracy of the system as a dosimetric replacement for film will be provided.

Financial support was provided by Eastman Kodak Company.