

AbstractID: 1458 Title: Comparison of a computerized radiography system with an amorphous silicon electronic portal imaging device.

A computed radiography (CR) system was investigated as an adjunct to an amorphous silicon electronic portal imaging device (EPID) for obtaining radiotherapy portal images. EPIDs acquire images in native digital form suited for use in an information management network. The acquisition is rapid, making the image immediately available. However, engineering and economic constraints limit the size of the field that can be imaged to about 22cm x 28cm. Until the technology becomes available for acquiring a composite image from multiple segment acquisitions, CR offers a means to acquire larger field images in a digital format that covers the area of a standard film cassette (14'' x 17''). We investigated the use of a storage phosphor screen CR system (Eastman Kodak Company, Rochester, NY). The imaging characteristics of the CR system were compared to those of an EPID system (PortalVision, Varian Medical Systems, Palo Alto, CA) using a contrast/detail phantom fabricated from an aluminum plate containing a matrix of flat bottomed holes having a range of diameters and depths. Images of the phantom were analyzed objectively by means of an image processing algorithm that detected the presence or absence of a hole image using a student t-test. This measure of image quality indicated that the CR system was equivalent to the EPID using 6MV x-rays. Subjectively, the images acquired for large fields by the CR system were acceptable as portal field images to the radiation oncologists using a digital information management system.