

Radiation oncology departments generate images using x-rays in the diagnostic energy range (simulator images) and high-energy photons in MeV range for portal imaging. One of the methods to produce digital images is by Computed Radiography system. CR uses an imaging plate of photo-stimuable phosphors to record an x-ray image, which is read by a scanning laser beam and the image is displayed on a high resolution monitor. CR systems provide good sensitivity and extended dynamic range for x-ray photons in the diagnostic energy range and the images are inherently digital. Development of a portal imaging system based on the computed radiography system can provide the crucial link in the conversion of the radiation therapy department to a film-less department with the added advantage of the distribution of the digital images in the network for the better patient care by the radiation oncologist.

We have experimented with a Fuji CR system. Different cassette modifications to the Fuji system were evaluated by comparing the portal images of a Las Vegas phantom using the 6 MeV beam from a Varian accelerator. The spatial and contrast resolution of the modified CR system were equal or better than those of the regular port films. The latitude of the CR system was also compared to the screen film system using a stepped wedge phantom and the CR system was found to be superior. In patient applications, CR image was found to be preferable because of the image quality and the ability to process and enhance features.