

AbstractID: 1321 Title: Clinical Acceptance of the Flat Panel for Megavoltage Portal Imaging at UCSF: Three Year Experience

The new generation of Electronic Portal Imaging Devices (EPID) based on the a-Si flat panel demonstrates superior sensitivity and resolution in image quality. This detector has dramatically changed our way of using EPID in clinic. We report on the clinical use of the detector, its long-term performance and present new applications developed in the last three years.

**Methods:** In February 2001, a large array (41x41 cm<sup>2</sup>, 1024x1024 pixels) amorphous-silicon flat panel portal imager was installed at the UCSF Cancer Center on a dual energy (6 & 18 MV) linac and clinical use and development of new applications started immediately. The longevity of the panel was assessed by measuring the MTF, the marker CNR and by visual observation.

**Results:** A daily average of 15 patients are positioned using two pre and two post-alignment orthogonal images. 1x3 mm gold markers implanted in the prostate are easily visible at all incidence angles, for any patient size, providing isocenter alignment with a 2 mm accuracy. The gain correction image, initially acquired daily can be obtained weekly or monthly with little impact on image quality. Images of the flat panel, even when acquired with a very small number of monitor unit (<2MU) compares favorably with port films. No permanent degradation of the initial panel performance was observed. In addition, the panel was used as a reference for the evaluation of other patient positioning tools and development of new applications include electron beam verification, dose reconstruction and MV cone beam CT.

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