
Methods: Patient setup verification is critical to accurately deliver a prescribed dose to a patient. We use portal film imaging on some of our old machines. KODAK RT2000 CR System was recently evaluated to replace the conventional portal films with digital imaging. Rando phantom was used to test the functionality and accuracy of the Kodak CR system. A treatment plan was generated using the CT images of the Rando phantom; the plan was then exported to Siemens PRIMUS via ARIA. Portal images were taken using KODAK photostimulable phosphor (PSP) system. The PSP system was read by scanning the phosphor using KODAK CR System. These digitized images were exported to Varian ARIA RT Chart and evaluated in Offline Review for registration of DRRs with the digital portal image. DRRs from the treatment planning system and digital portal images from KODAK CR System were matched and differences between the planned set-up and the in-room set-up of phantom were measured with tools in Offline Review. Shifts in lateral, longitudinal and vertical directions along with tilt angle were obtained to finally register the DRRs with the digital portal images.

Results: We converted our old film-based portal imaging system into a digital portal imaging system. These digital images can be shared across a network. A digital imaging system provides easy access through ARIA network for physician’s approval of portal images.

Conclusions: We successfully integrated four different multi-vendor modalities (Odyssey TPS from Optivus, Siemens’ Primus, Varian ARIA and KODAK CR System) to develop a portal digital imaging system. The system increases accuracy of treatment, offers flexibility of offline review by a physician, and thus makes the whole process more efficient.