A total of 124 daily KV-CBCT images from six patients, who received concurrent IMRT treatment for the prostate and pelvic lymph nodes, were studied. For each set of KV-CBCT, the contours of prostate, bladder and rectum were manually delineated by a physician. The displacement and deformation of prostate can be measured using CBCT prior to each fraction of treatment. Dual image registrations were performed: one is aligned to the bone which gives the setup error and the other is aligned to the prostate contour which provides the position of prostate. Three sets of verification plans were generated and compared. The first one was created according to the MLC shift, the second and third were based on the conventional iso-tracking method by shifting the isocenter according to the prostate contour and the bony structure respectively. The MLC shift method is based on a previous proposed leaf-shifting algorithm [1] which can track the movement of the prostate. After the dose has been calculated for the three sets, DVH data are extracted for the prostate, lymph nodes, bladder and rectum for each plan and compared for the three strategies. Some dosemetric results are reported in: Figure 1 which shows the normalized dose to 95% of the prostate (a) and lymph nodes (b) based on daily KV-CBCT for MLC-shift, bone iso-shift and contour iso-shift methods versus fraction number; figure two presents the normalized dose as function of the displacement for the prostate(a) and lymph nodes(b).

Reference: