

## AbstractID: 4519 Title: Dose comparison of MVCB and Orthogonal Pair Portal images

**Purpose:** To evaluate the delivered patient doses resulting from MVCB(Mega-Voltage Cone Beam)and ORTH(orthogonal pairs)portal imaging techniques, and report dose per MU(cGy/MU)and absolute dose(cGy)at isocenter, max dose,and mean doses to the target and critical organs.

**Method and Material:** Both image techniques are based on a Siemens 6 MV LINAC equipped with an A-Si flat panel and dose calculation done on a Pinnacle 3DRTP system.The ORTH technique was simulated by two orthogonal beams,total 6 MUs and 20cmx20cm field size.The MVCB technique was delivered with a 200° arc beam, total 9 MUs and the same field size.30 patients representing 6 treatment sites were analyzed.Calculated doses were reported for max dose in patient,dose at the isocenter, and mean doses to target and critical organs.

**Results:** For the cGy/MU analysis, the value at isocenter was similar.The difference of max dose was greater in pelvis and abdomen.The mean dose in normal lung or contralateral breast differed greater than other critical organs.In contrast,the dose difference in the target or critical organs close to isocenter was very small.The absolute dose difference and 2D absolute dose distributions are shown.The high dose area for ORTH technique is located at the proximal corner of rectangular areas intersected by the two beams but anteriorly for MVCB due to the anterior arc,and contributes more dose to anterior organs like normal lung and contralateral breast.

**Conclusions:** From our analysis,high dose region generated by MVCB is shown inside the critical organs,and tends to be larger compared to the ORTH technique.Due to the potential biological effects,the extra dose burden to the critical structures should be monitored carefully.This study provides a quantitative analysis and suggests the number of projections and total MUs are the most important factors for the MVCB technique.