

## AbstractID: 7322 Title: Compatibility of IMRT Plans for the Matched Beam Linear Accelerators

**Purpose:** To investigate the compatibility of IMRT plans for closely matched beam linacs in terms of patient-specific quality assurance results. We are interested to know if there is a systematic passing rate difference between IMRT QA results when planned and delivered on the same machine and when planned and delivered on different machines.

**Method and Materials:** An Elekta Precise (L5) and Elekta Synergy (L6) linacs with closely matched 6 MV beam data were commissioned in Pinnacle<sup>3</sup> (version 7.6c) for planning of IMRT. A total of 56 fields were planned on L5 and 40 fields were planned on L6. Planar dose distributions of all the fields were measured with a MapCHECK 2D diode array. Comparison between the planned and measured dose distributions were done using both the 3%/3mm and 2%/2mm criteria in the absolute dose comparison mode.

**Results:** When planned and delivered on L5, the average passing rates were  $98.3 \pm 1.4$  % with 3mm/3% criteria and  $93.2 \pm 3.1$  % with 2mm/2% criteria. The same plan delivered on L6 had the average passing rates of  $97.0 \pm 2.5$  % with 3mm/3% criteria and  $88.6 \pm 5.0$  % with 2mm/2% criteria. For the plans planned and delivered on L6, the average passing rates were  $96.2 \pm 3.5$  % with 3mm/3% criteria and  $88.5 \pm 6.2$  % with 2mm/2% criteria. When the same plans were delivered on L5, the average passing rates were  $97.9 \pm 1.8$  % with 3mm/3% criteria and  $92.1 \pm 4.0$  % with 2mm/2% criteria. The average passing rates were about 98.1% on L5 and 96.6% on L6 with 3%/3mm criteria regardless of which beam data were used for the planning.

**Conclusion:** No systematic differences were observed in the currently adopted QA criteria. More planning studies are needed to investigate the differences in dose distribution and DVH for typical clinical cases.