

AbstractID: 13494 Title: Dosimetric effect of variation in couch position relative to isocenter for intensity modulated arc therapy

**Purpose:** To investigate the dosimetric effect of variation in treatment couch positioning relative to isocenter for intensity modulated arc therapy. **Method and Materials:** 5 RapidArc (Varian Medical Systems, Palo Alto, CA) treatment plans (2 head and neck, 2 prostate, and a lung) were selected that were calculated including the treatment couch with the support rails in the lateral position. Calculations were done for the couch positioned  $\pm 3$  cm relative to isocenter and for the support rails in the center position. Dose-volume histograms were compared for the targets and critical structures. **Results:** For  $\pm 3$  cm shift, the largest deviation of the minimum, maximum, and mean target doses was 0.2%. For the critical structures, the largest deviation of the minimum, maximum, and mean doses was 0.6%, 0.4%, and 0.4%, respectively. The largest deviations occurred for the head and neck plans. Excluding the head and neck plans, the largest deviation of the minimum, maximum, and mean critical structure doses was 0.2%. For the support rails in the center, largest deviation of the minimum, maximum, and mean target doses from the planned lateral rail position was 1.6%, 1.6%, and 1.1%, respectively. For the critical structures, the largest deviation of the minimum, maximum, and mean doses from the planned lateral rail position plan was 0.9%, 3.8%, and 1.2%, respectively. **Conclusion:** The effect of couch shifts of up to 3 cm relative to isocenter is small. For positioning systems indexed to the treatment couch, the daily variation of the couch position can be safely ignored. However, for positioning systems that are independent of the couch, care must be taken to limit the daily deviation. The support rail positions have a more significant effect than couch position relative to isocenter.

**Conflict of Interest (only if applicable):** First author has a sponsored research agreement with Varian.