AbstractID: 10689 Title: RapidArcTM: Commissioning and Dose Escalation possibilities.

Purpose: This paper reports our experience in commissioning RapidArc™ for use in clinical practice. Additionally, we performed a dose escalation planning study using radiobiological parameters to compare the outcome of IMRT and RapidArc plans.

Method and Materials: For commissioning we used a standard set of guidelines as outlined by C. Ling et al. This augmented with dosimetry checks, including absolute point measurements in phantom and relative comparisons in air. In addition, we introduced more automated methodologies for picket fence testing of the MLC during RapidArc delivery. Because of different couch systems than presumed in the implementation by the manufacturers a new parameterization of the couch was introduced. In a preliminary dose escalation study of 8 clinical patients we evaluated the treatment plans on a radiobiological basis.

Results: For Commissioning: the measurements differed not more than 2% of the predicted values. For Dose Escalation: NTCP calculations for grade 2 rectal bleeding showed a significant reduction (p=0.03) of the mean NTCP from 2.6% to 1.9%, even in this small group of patients. TCP values did not differ significantly (TCP(IMRT)=75.5%, TCP(RA)=75.4%).

Conclusion: Methods described in this report lead to successful implementation of RapidArc in clinical practice. At time of presentation we expect to increase the statistics to 25 patients.

Conflict of Interest :
Research sponsored by Varian Medical Systems, Palo Alto, California, USA.