Methods

- 6 CT data sets were planned manually by the user and by the auto-planning module in 100 iterations.
- Pinnacle version 16.2 was used for all plans and the data sets will be treated with a simultaneous integrated boost (SIB) or as originally prescribed.
- Elekta Agility linear accelerator (LINAC)
- Final result normalized 95% to a Calc Point.
- Each plan is allotted two full arcs, one rotating clockwise and the other counterclockwise.
- All of the data sets were planned with the collimator at 20° for the clockwise arc and 340° for the counterclockwise arc.
- Three primary goals were to:
  - cover at least 95% of the PTV with the prescription dose
  - spare the OARs and normal tissue as much as possible
  - maintain PTV dose homogeneity
- The maximum dose limits for the OARs are listed in Table 1.

Results

With respect to PTV prescription conformity as seen in Table 2 the auto-planning module did, on average, 15% better when there was one PTV. When there were two PTVs the automated plans were about 6% and 8% more conformal for the high and low PTVs respectively. The HI for automated plans with a singular PTV was 1% better but for plans with a high and low PTV the automated plans were 2% more homogenous. The doses to the bladder were very similar with the automated plans with a singular PTV was 1% better but for plans and 8% more conformal for the high and low PTVs respectively. The HI for automated plans with a singular PTV was 1% better but for plans with a high and low PTV the automated plans were 2% more homogenous.

Conclusion

As shown by the data we have proven that more aggressive modifications to ROIs are required in order to have a clinically superior plan. Furthermore, a single 2cm ring is sufficient for shaping the lower doses to include 50% of the prescription. In short, the auto-planning module produces a favorable and more consistent starting point than the manually planned data sets respectively. The automated approach remained consistent and the ROI template that the module used can be implemented by Kusters et al.

References