

## Purpose and Methods

With increased plan complexities requiring VMAT, there has been a rise in re-CT simulations and re-plans. This rise has been in part due to dose differences caused by patient body contour changes. When combined with increased volumes, re-plans place a heavy burden on the entire clinic.

A preliminary study was conducted using 5 randomly selected pelvic patients. For each patient, the body contour was modified to simulate weight gain and weight loss as follows: +/- 3cm and 5cm for 1/6<sup>th</sup> of the arc, +/- 1cm and 3cm for 1/3<sup>rd</sup> arc, and +/- 1cm and 2cm for half of the arc. Primary and nodal PTV coverages, rectal doses, and max doses were then analyzed.

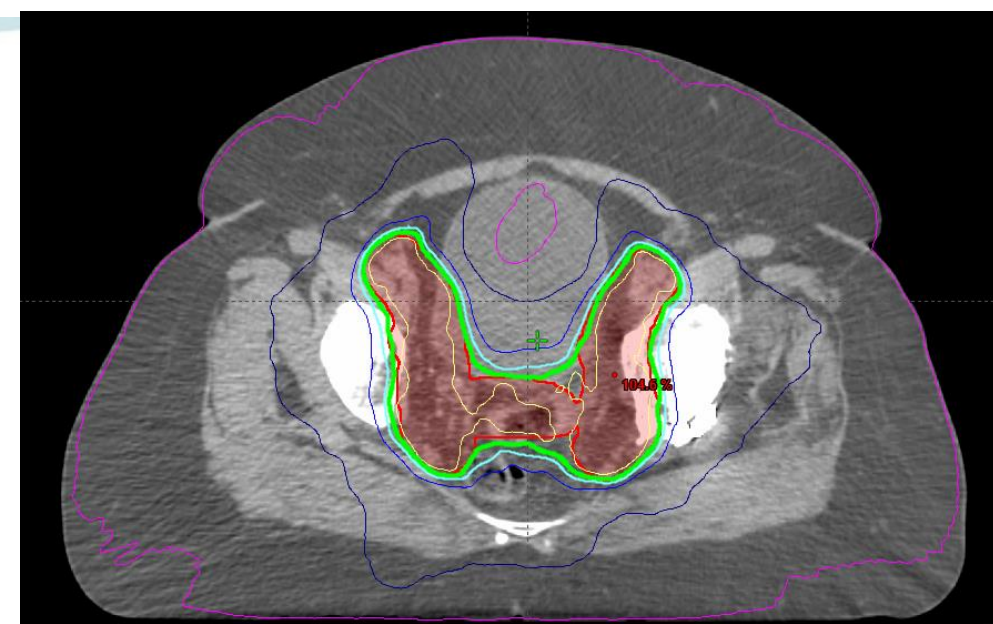


Figure 1:  
Original  
Plan

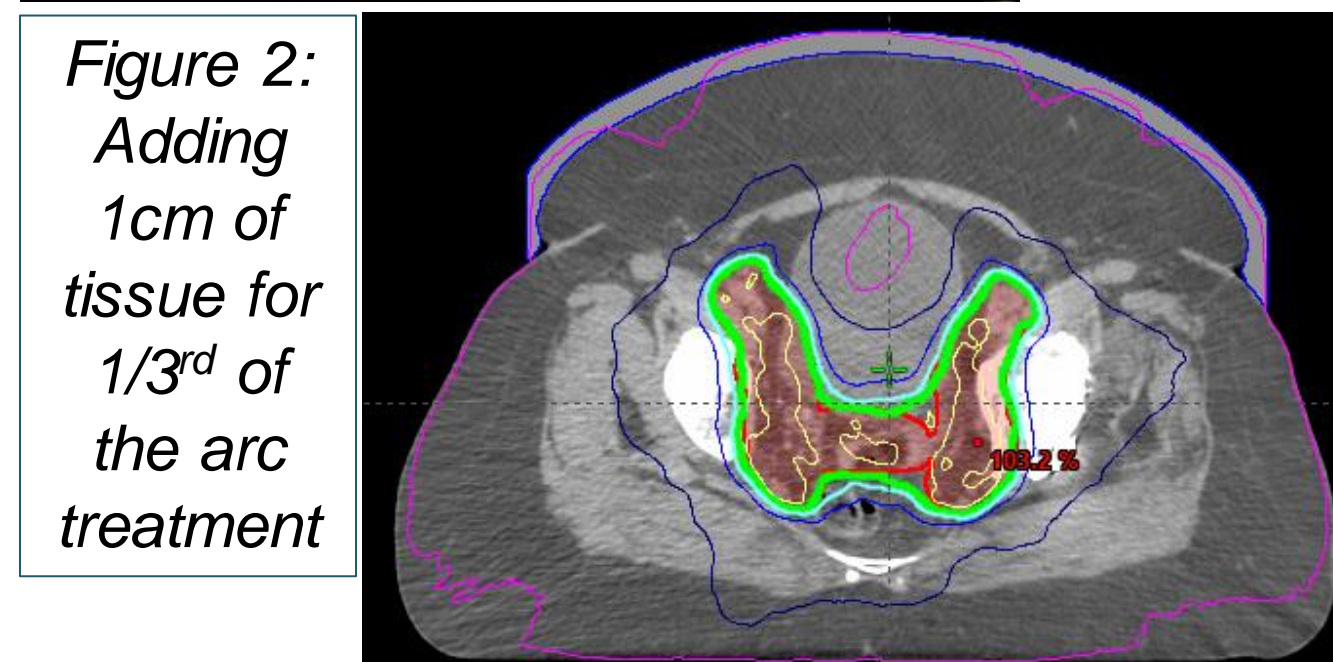


Figure 2:  
Adding  
1cm of  
tissue for  
1/3<sup>rd</sup> of  
the arc  
treatment



Figure 3:  
Removing  
3cm of  
tissue for  
1/3<sup>rd</sup> of  
the arc  
treatment

## Results and Conclusion

Weight gain simulations showed decreased target and OAR doses, with the contrary observed for weight loss. On average, the largest differences were seen for contour changes over 1cm for at least 1/3<sup>rd</sup> of the arc. These differences were ~5%. Individually, the largest differences occurred for the 5cm weight loss simulations for 1/6<sup>th</sup> of the arc. These differences were due to the body contour entering the PTV.

VMAT plans are forgiving due to the many angles used during treatment delivery. Additionally, dose differences of ~5% for contour changes greater than 1cm for 1/3<sup>rd</sup> of the arc do not necessarily equate to a re-plan. Fractions remaining and hot spot locations will also play a factor.