

Reduction of interobserver contouring variations through a retrospective, evidence-based intervention

H. Patrick¹, L. Souhami², J. Kildea^{1,2}

¹ McGill University, Montreal, Quebec, Canada

² Department of Radiation Oncology, McGill University Health Centre, Montreal, Quebec, Canada



INTRODUCTION

Interobserver variability in target delineation can impact treatment plan quality and may negatively impact patient survival and toxicity incidence¹.

Contouring variations are not regularly assessed in routine clinical practice due to the time burden of conventional dummy-run studies

AIM

To assess if retrospective treatment planning data from routine practice can be used to reduce the level of interobserver contouring variations between radiation oncologists at a single institution.

METHODS

The target contouring habits of four radiation oncologists (ROs) were assessed using 492 prostate cancer treatment plans created between 2012-2018 (Rx: 60 Gy/20 fr). Student's 2-sample t-tests were used to determine if contour volumes and lengths were statistically different between ROs.

ROs were informed of target contouring inconsistencies at an intervention meeting and invited to select standard target contour definitions from the literature to use going forward.

The impact of the intervention was assessed one year after, using 152 plans created post-intervention.

RESULTS

Significant differences in target contouring existed between observers pre-intervention that impacted dose to nearby OARs (Fig 1). These dosimetric differences did not persist post-intervention.

Prostate Target

Pre-intervention, one observer consistently contoured smaller prostate volumes compared to their peers (Fig 2).

Post-intervention this observer adjusted their habits and are no longer different from their peers.

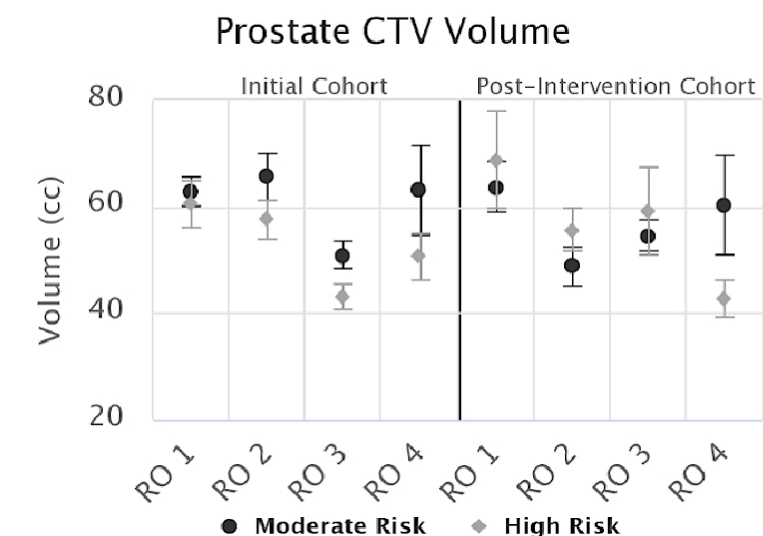


Figure 2: Mean prostate CTV volumes before and after the intervention. Error bars show standard uncertainty on mean.

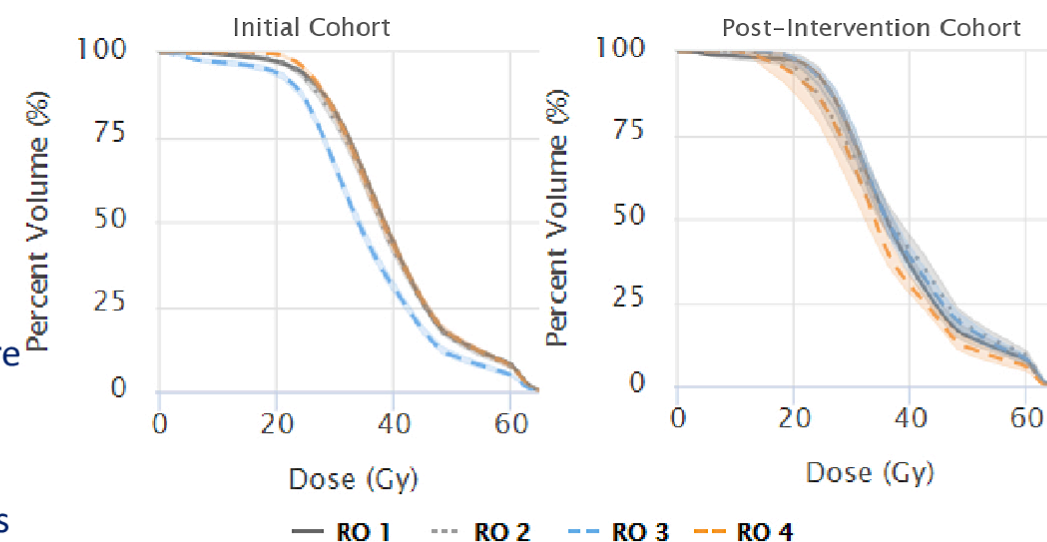
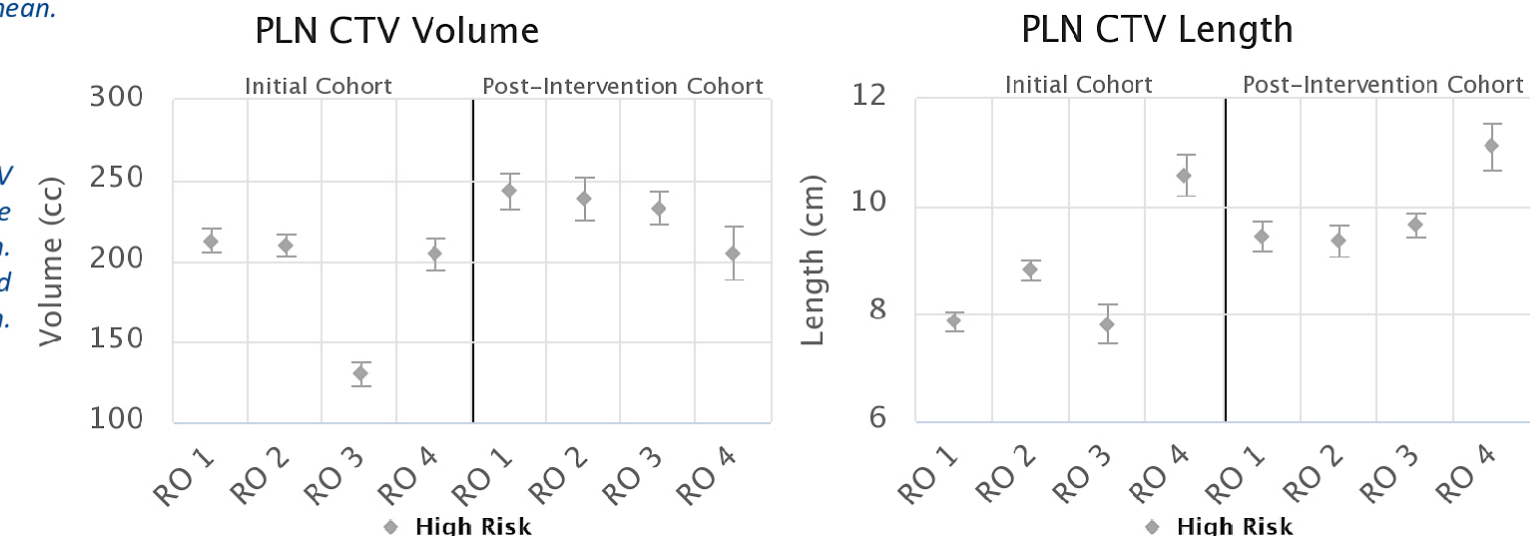


Figure 1: Mean rectum DVHs before and after the intervention. Shaded regions show standard uncertainty on mean.

Figure 3: Mean PLN CTV volumes and lengths before and after the intervention. Error bars show standard uncertainty on mean.



Pelvic Lymph Node (PLN) Target

Pre-intervention, PLN contour lengths (Sup-Inf) were inconsistent between observers and one observer consistently drew much smaller target volumes (Fig 3).

Post-intervention, oncologists set a standard contour definition for the first time ever. Subsequently, variations in contour size reduced, however one observer did remain significantly different from the others because of less strict adherence to the new standard.

CONCLUSIONS

Interobserver contouring agreement between oncologists increased following an intervention based on evidence gathered from a retrospective analysis of clinical data.

Semi-regular review with this type of approach may aid improvements in intra and inter-institutional practice standardization and improve quality of care.

ACKNOWLEDGEMENTS

Fonds de recherche
Santé

Québec



Réseau de
cancérologie
Rossy

Rossy
Cancer
Network

REFERENCES

1) Peters LJ et al. Critical impact of radiotherapy protocol compliance and quality in the treatment of advanced head and neck cancer: results from TROG 02.02. *JCO*. 2010 Jun;28(18):2996–3001.

CONTACT INFORMATION

Email: haley.patrick@mail.mcgill.ca