

Unified Dose Tolerance Limits for SBRT

Purpose:

To unify and consolidate the stereotactic body radiation therapy (SBRT) dose tolerance limits from various authors into a more usable format.

Methods and Materials:

A thorough literature review uncovered 375 dose tolerance limits for anatomical critical structures throughout the body, applicable to SBRT treatments employing one to five fractionated sessions. The dose tolerance limits vary significantly among authors. Some authors present limits in terms of cubic centimeters while others are in terms of percentage volume, and the doses and volumes specified vary greatly. We propose a unified format that specifies dose limits to several salient volumes that are the same for all critical structures within each classification. We also developed a DVH Evaluator software tool that helps manage various dose tolerance limits and helps evaluate the DVH for clinical use.

Results:

The format of unified dose tolerance tables are proposed and several sample critical structures are presented. Further work with radiobiology and DVH analysis will be required to fill in the remaining gaps for all the relevant critical structures.

Conclusion:

This work represents significant progress towards unifying the dose tolerance limits for SBRT, but much more work is needed. We recommend formation of AAPM and ASTRO task groups to thoroughly address this issue from both physics and physician perspectives.

Conflict of Interest:

None