A Decision Support Tool for SBRT Planning using a Searchable DVH Database

Impact: This tool has the potential to improve plan quality and evaluation speed by allowing quick comparison to DVHs and clinical data from previously treated plans. The tool could be particularly useful for inexperienced planners or physicians by providing easy access to large sets of historic data specific to their center.

Innovation: The innovative element of this tool is the easy and quick access to the searchable DVH database. A clinician could access similar data by opening each individual plan in the planning system, but it would take a prohibitive amount of time to access the large amount of data that can be accessed in the DVH database in only a few seconds.

Importing (Figure 1)

Figure 1 shows the interface used to import plan DVHs and clinical field values into the database after export from the treatment planning system (left), and the interface used to match DVH structure names to standardized names (right, below).

Searching (Figure 2)

Figure 2 shows the screen used to search for sets of DVH in the database. In this case, lung tumors of the left upper lobe prescribed with 3 fractions totaling 5400 cGy were selected. The list on the right shows the matching DVHs, with the number of matches in parenthesis next to the structure name (not all structures are present in every plan).

Viewing (Figure 3)

Figure 3 shows example search results for DVHs of SBRT lung patients prescribed 5400 cGy in 3 fractions (n=69) with PTVs ≤ 7.5 cc on the left and PTVs ≥ 7.5 cc on the right. In plan comparison, the plan being evaluated is overlaid with the search results and/or the min/max/mean DVHs.

Conclusion: A searchable DVH database for SBRT planning has been developed. In the future we will add more searchable parameters and include outcomes data. This tool will be useful during the planning and evaluation processes, and for future research studies.