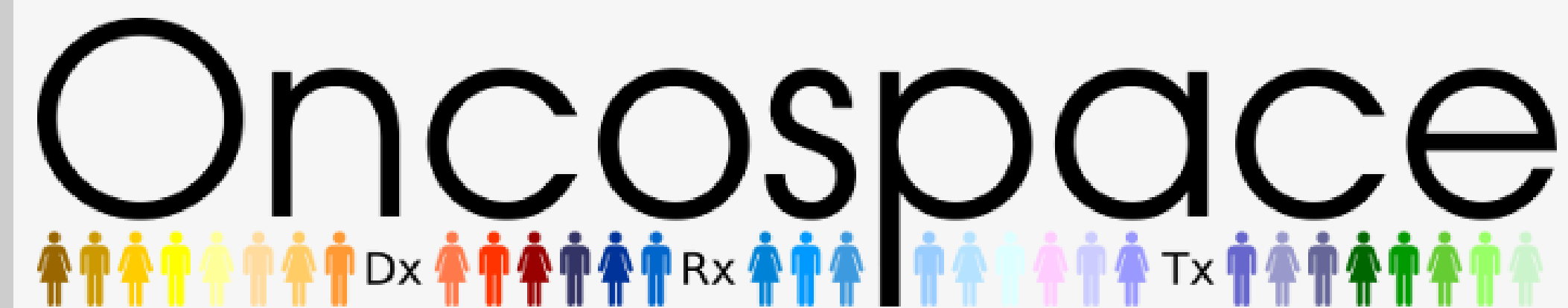


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Purpose

We implemented a local instance of a common database structure and web-browser based data collection tools as an Oncospace consortium member to support evidence-based clinical decision making and comparative effectiveness research through shared outcomes data. Using the local and federated databases, we demonstrate the power of the larger pooled dataset on clinical decisions for individual patient care.

Methods

A consortium of multiple academic medical centers agreed to implement a federated database, known as Oncospace. We began collecting head and neck (H&N) patient data into our local Oncospace in January 2015. Other consortium members have been collecting similar data over a longer timeframe. We used the data query and analysis tools to display dose vs toxicity data for a single local patient overlaid on the same data for all patients in the local and federated Oncospaces.

Results

The dose/volume data such as dose volume histograms (DVHs) and overlap volume histogram (OVHs) for organs at risk (OARs) predict for toxicity. The federated Oncospace contained outcomes and toxicity data as well as planning data for over 1000 patients. We queried and plotted the dose volume histograms for several OARs related to xerostomia. Comparisons of clinical data for similar cases from different institutions can be used to inform treatment planning and to predict toxicity-related outcomes for new patients.

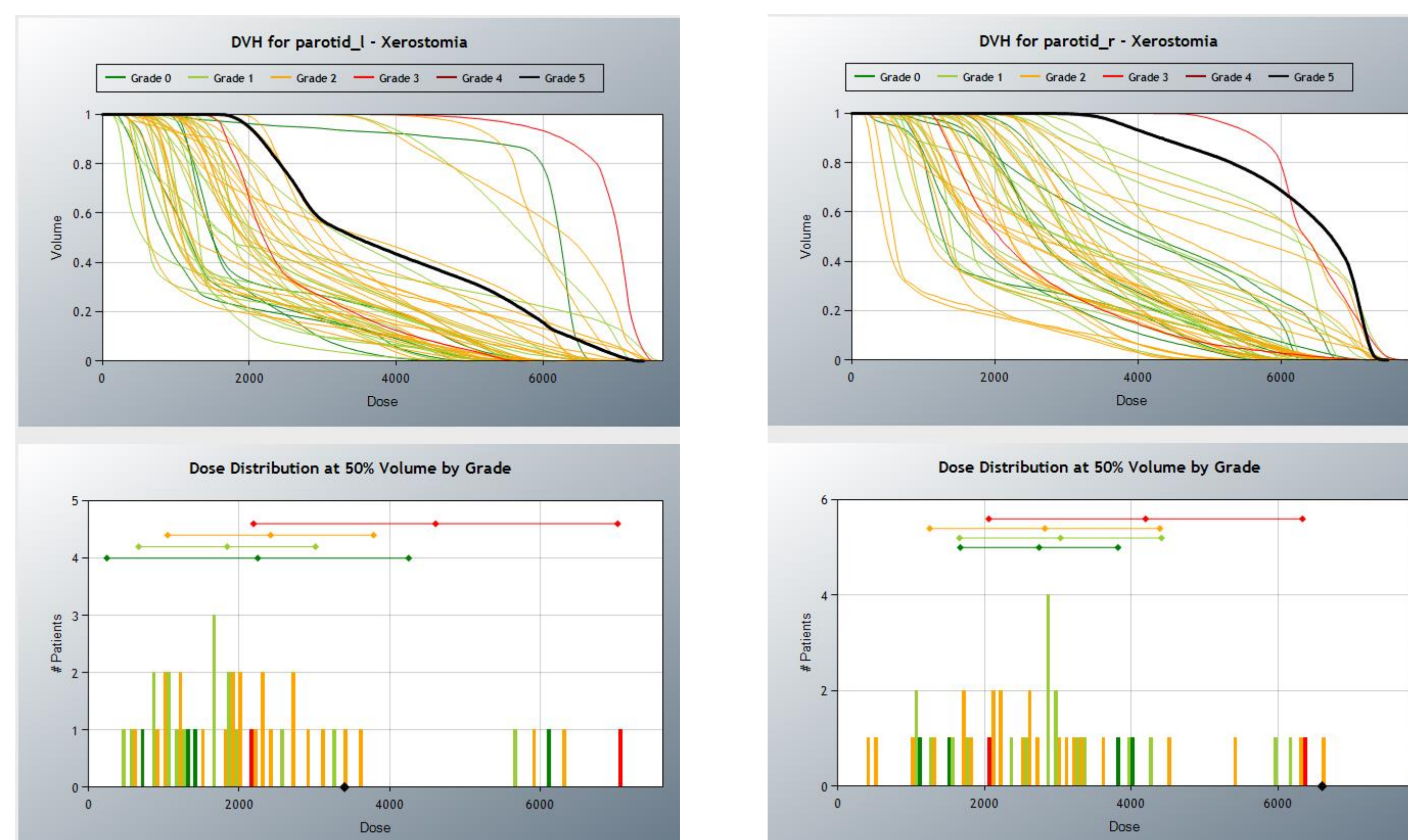


Figure 1. Plots of dose volume histograms for left and right parotids, color coded by grade of xerostomia. These plots include head and neck patients from UW only.

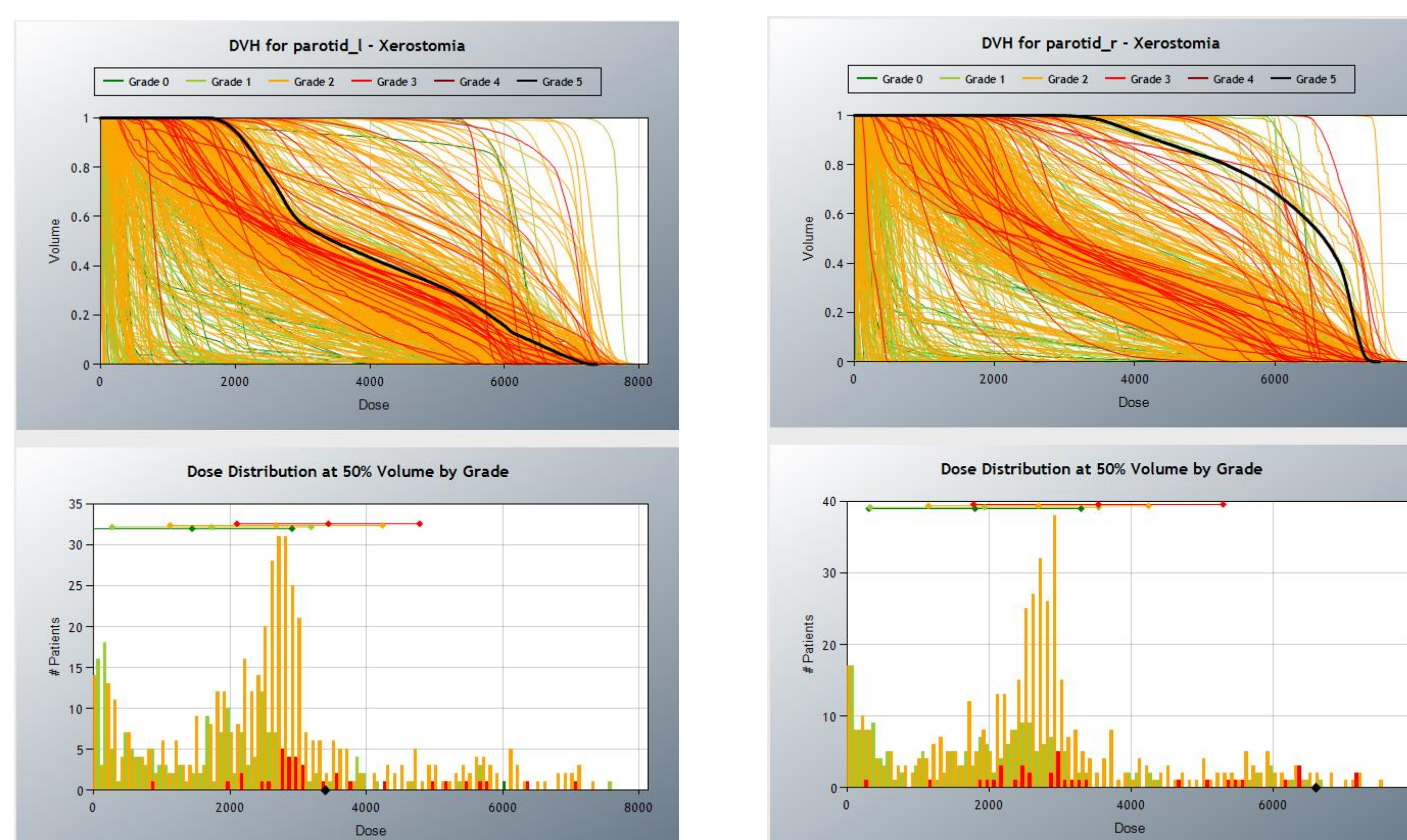


Figure 2. Same plots showing pooled UW data with federated data.

Conclusions

The migration from unstructured data mainly in the form of notes and documents to searchable, structured data is difficult. Making the transition requires cooperation of many groups within the department and can be greatly facilitated by using the structured data to improve clinical processes and workflow. The original database schema design provided enough flexibility for multi-institutional use to improve each institution's ability to study outcomes, determine best practices, and support research. The project has demonstrated the feasibility of deploying a federated database environment to multiple institutions to support clinical decision making.

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