

## **Workaround for Corvus Data Transmission to ITC**

Procedures for Sending both CTV and PTV Structures, based upon the TJU approach.

Since, Corvus does not allow overlap between Corvus-defined PTVs and other structures (CTVs and OARs) in data exported using RTOG Data Exchange format, the user must define and submit separate plans, one containing the user-defined CTV and organs-at-risk, and the other containing the user-defined PTV. The first plan will be a standard plan and will be used to insure that the protocol requirements are met. This plan will be used by the ITC to read the CTVs. The second plan will contain the PTVs and will be a phantom plan developed using the same patient CT data set.

The following procedures assume that the contours have been defined external to Corvus, e.g. on AcQsim, or some other virtual simulation platform. If the contours are to be defined on Corvus, the oncologist must define the appropriate structures on both the standard plan (which contains the user defined CTVs and OARs) and the phantom plan (which contains the user defined PTVs).

### **Procedure**

1. Generate a treatment plan, beginning with the patient info mode. Enter all appropriate information. Enter "Patient" as the treatment plan type. In the Image Registration mode, identify and process the pertinent items. Set the ROI such that it encompasses the entire CT data set, i.e. 512 x 512. (In Version 5 and above, the data sets are automatically made square.)
2. After image registration, enter the Anatomy Mode and edit tissue (skin). Exit the plan and copy the plan. The purpose of this is to generate two data sets with identical external contours. For the second data set, enter "Phantom" as the treatment plan type and modify the name to include PTV.
3. Return to the patient plan type (the first data set). In the Anatomy mode, use the DICOM-RT structure association tool to associate the GTV and all CTV's. Remember to associate in order of small organs to large organs and higher dose to lower dose volumes. The parotids should be associated before the nodal chains. The cord, mandible, and brainstem should be associated before the skin. Do not associate any user defined PTV's.
4. After the associations have been made, enter the Prescription mode. Set the localization uncertainty to 5 mm or greater. As Corvus' users know, this will define the Corvus PTV's. Define all prescription parameters such that the protocol requirements are met.
5. Review the final plan to insure that all protocol specifications are met. (When this plan is sent to the ITC, they will read the all CTV's, the parotids, the mandible, and the brainstem.)

6. Now exit and enter the second phantom plan. (Remember that you must first run a simple plan in order for any phantom plan to be included on the list of phantoms.) This second phantom plan will have the same external contour as the first plan.
7. Enter the anatomy mode and use the DICOM-RT structure tool to associate the GTV with the GTV-PTV. Use the Grow Filled Structure Operator to grow the GTV\_PTV by 5 to 10 mm, depending upon clinical judgment. Do this for all slices which contain the GTV\_PTV. For the most superior and inferior slices, the growth the GTV\_PTV is left to the judgment of the user. The user can copy the previous contour to the superior or inferior slice and then shrink it by 3 mm.
8. Use the DICOM-RT structure tool to associate the CTV66 with the PTV66\_1. Grow this by 5 mm. Please remember to start with the highest dose smallest volumes. Do the association and then the growth one volume at a time.
9. After all of the volumes have been associated, calculate a simple plan so that this phantom will appear on the list of phantoms. Wait for this simple plan to be calculated.
10. Exit from the second phantom plan and go to the Select Plan Screen. Highlight the first plan and go to the Create hybrid Phantom Plan from Study. Select the second plan as the phantom plan. Enter the coordinates of the selected study's calculation point and the coordinates of the phantom document's measurement point. (These two sets of coordinates should be the same.) Perform the calculation on the phantom plan.
11. After review, send both plans to the ITC. As noted above, the ITC will extract the CTV contours from the patient plan and the PTV contours from the phantom plan.

*Updated Feb. 2007, W. Bosch*