

## AbstractID: 11490 Title: The impact of dose prescription on treatment volume

### **Purpose:**

To determine the effect of dose prescription on the relative volumes of normal tissue being treated.

### **Method and Materials:**

Clinical treatment plans (4-field prostate, 10-field SBRT and 4-field 3d Brain) and phantom plans (2cm and 8cm diameter targets, using 4-field box) were studied on the Pinnacle treatment planning system. For each case optimized plans were developed and doses calculated using a 2 mm calculation grid. PTV's were taken from the clinical plans or defined as the target volume for the phantom cases. The effect of block margin on dose distributions was evaluated for three levels of PTV margin: 1.0, 0.5 and 0.0 cm. For each case isodoses were separately generated based on either ICRU dose normalization (prescription dose normalized to 100% at the isocenter) or on prescription line normalization, where a prescription isodose line was selected such that 95% of the PTV receive 100% of the prescribed dose.

### **Results:**

We separately analyzed each clinical and phantom case for the different combinations of block margin and dose normalization criteria. Isodose volumes were calculated for each configuration and plotted for comparison.

### **Conclusion:**

One of the advantages of the ICRU definition of prescription dose is that uniformity in dose reporting can be achieved. We have found that inclusion of 0.5 to 1.0 cm margins around PTV's, in conjunction with ICRU dose prescription, can reduce the hot spot doses by as much as 30% with smaller tissue volumes irradiated to lower isodoses, while providing almost equally good coverage of the 95% volume as is obtained with tight blocking and lower isodose prescription lines.