AbstractID: 1697 Title: Direct Dose-Calculation Algorithm Comparisons: Corvus versus Pinnacle

Comparing the accuracy of treatment planning systems is complicated by many factors, including different dose calculation algorithms, DVH calculation methods, etc. Nonetheless it is essential to understand the accuracy of each system. A system that calculates dose faithfully is preferable to a system that produces "better" looking but less accurate treatment plans. The goal of this research was to perform a direct comparison between two commercial treatment planning systems, Corvus4.0 (NOMOS Corp.) and Pinnacle6.2b (Philips Medical Systems). The deliverable MLC leaf sequences and dose distributions from the original Corvus4.0 plans were imported twice into Pinnacle6.2b. One copied plan recalculated dose in Pinnacle6.2b based on the deliverable leaf sequences while the second plan kept the Corvus4.0 dose distribution. This procedure was repeated for eight single open-field plans and 10 IMRT prostate plans. Film measurements were taken using the same deliverable leaf sequences. Pinnacle6.2b predicts greater doses than Corvus4.0 for fields smaller than 5x5cm^2, but the trend reverses for field sizes larger than 6x6cm^2. Pinnacle6.2b also predicts sharper penumbras and higher low-dose-tails than Corvus4.0 for fields smaller than 6x6cm^2, but lower low-dose-tails than Corvus4.0 for fields greater than 6x6cm^2. The average percentage-volume of prostate-PTV $\geq$ 75.6Gy (97.6% Corvus4.0, 93.4%Pinnacle6.2b; p=0.009) and seminal vesicle-PTV $\geq$ 75.6Gy (97.2% Corvus4.0, 91.1%Pinnacle6.2b; p=0.007) are lower in Pinnacle6.2b calculations. However, there was no significant change in rectum or bladder DVH calculations. Overall the differences between Pinnacle6.2b and Corvus4.0 calculations were smaller than the differences between the film measurement and calculations.