AbstractID: 14239 Title: 124 patients Treatment Plans Evaluation Experience between Tomotherapy Helical, Eclipse Rapid-Arc and Static IMRT

Purpose: Advances in radiotherapy external beam equipments has evolved to such a degree, it is difficult to compare quality, delivery efficiency, and accuracy of each treatment scheme, without considering the skill of the operators. With multiple systems in a new radiation oncology department, the authors did exhaustive trials on each of the treatment methods on every eligible IMRT patient for comparison. **Method and Material:** The physics team of two persons with over 50 years combined treatment planning experience, evaluated 124 IMRT treatment plans between Tomotherapy helical system, Varian Eclipse 3D-conformal-sliding-window static IMRT, Rapid Arc, single and multiple arcs. Plans are based on identical CTV, PTV, Organ of Interest constraints. Multiple trials were done to determine the best plan which is normalized identically for DVH comparisons. The plans were compared for: ***efficiency/ease of planning*** including operator interaction time, computation time; ***Plan quality*** including conformality, homogeneity and organ protection; ***dose delivery accuracy*** including absolute point dose, and 2D relative dose matching using MATRIXX 2D-ion-chamber array; ***delivery efficiency*** including setup plus treatment time. **Results:** There was no single "winner" when all parameters were taken into account. Tomotherapy planning took less interactive-time, required knowledge and skill in choosing beam-width, pitch, constraints and other parameters. Batch beam-let calculation saves time. Eclipse planning required more interactive time, allowed progressive improvements by trial and error up to a limit. Tomotherapy is straight-forward and less likely to cause treatment error. Varian system allowed flexibility. Rapid arc took less time to deliver, CBCT was not as straight-forward. Both system were capable to achieve clinical tolerance of 5% and 3 mm. **Conclusion:** This multivariable comparison gave a realistic view. Final choice depended on clinical preference, region of interest, ease of delivery, error-free treatments and end results expected. Each system had it's own merits for a given clinical condition.