AbstractID: 4690 Title: Conformal vs. IMRT Concomitant Boosts for IMRT Based Head and Neck Treatment

Purpose: To evaluate conformal 3D-CRT and IMRT techniques for the boost portion of a concomitant boost treatment schedule for IMRT based head and neck radiation.
Method and Materials: Nine-field IMRT plans were generated using Eclipse for 4 stage IV oropharynx patients, treating all target volumes initially to 57Gy. Two alternative plans were then generated to deliver a 15Gy boost to gross disease: a 3D conformal plan, using 3-4 fields, and 5-field IMRT plan. Boost volumes ranged from 25-60cc. The IMRT and 3D-CRT boost plans were evaluated as individual graphic plans and as a cumulative with the first course treatment for a total dose of 72Gy (IMRT/IMRT and IMRT/3D-CRT combinations). The comparison assessed target coverage, dose to critical structures (parotids, cord and oral cavity), hot spots and number of monitor units (MU).
Results: Evaluated as a cumulative plan the IMRT/IMRT technique met all the constraints for critical structures (mean dose to parotid 26Gy, cord max 46Gy) and the hot spots were between 104-106%. The IMRT/3D conformal technique also met the constraints for the critical structures with hot spots between 103-105%. Both cumulative plans achieved 98.6-100% coverage of boost volumes. Evaluated as individual plans both the IMRT and 3D conformal boost plans achieved the desired coverage while keeping the dose to critical structures at a minimum; hot spots were located within the confines of the boost volume. The number of MU's ranged from 250-296 for the 3D-CRT plan in comparison to 360-562 for the IMRT. Average planning time was 1.0 and 2.5 hours for the IMRT and 3D-CRT boost, respectively.
Conclusion: Both boost techniques are dosimetrically equivalent. Treatment technique can therefore be chosen based on the available clinical recourses