

## **A study of forward treatment planning with integrated multi-prescription dose for patients with nasopharyngeal carcinoma**

**Purpose:** To investigate the feasibility and indications of forward treatment planning with integrated multi-prescription dose for patients with nasopharyngeal carcinoma.

**Methods and Materials:** Six patients with nasopharyngeal carcinoma treated by IMRT technique were selected for this study. A forward IMRT treatment plan was created for each patient on Pinnacle 6.2 Treatment Planning System (TPS), which was optimized by integrating multi-prescription dose plan according dose distribution. Six inverse IMRT plans were created and optimized on CORVUS 6.3 TPS for these six patients, dose distribution of planned treatment volume for gross tumor volume ( $P_{GTV}$ ) and clinical target volume ( $P_{CTV}$ ) and normal critical structure were compared between forward and inverse IMRT plan for each patient. Comparisons on conformity index (CI) of  $P_{CTV}$  were made as well.

**Results:** Based on dose constraint criterion in the RTOG0225 protocol, the dose distributions of the PTV and the normal critical structures met the goal. The dose of 95% Volume of  $P_{GTV}$  and  $P_{CTV}$  received was ranged from 69.8Gy to 70.8 Gy and from 54 Gy to 55.6 Gy, respectively. The CI mean value of  $P_{CTV}$  was 0.51 in forward plan, compared with 0.52 in inverse plan. It took 2 hours on average to complete a forward IMRT plan.

**Conclusions:** The forward treatment planning with integrated multi-prescription dose is feasible for early stage nasopharyngeal carcinoma, planning and treatment time were shortened significantly.