AbstractID: 9121 Title: Evaluation of laryngeal sparing techniques for head and neck IMRT

Purpose:
Concern exists that the widespread implementation of whole-field intensity-modulated radiotherapy (WF-IMRT) for treatment of head and neck cancer has resulted in increased levels of dysphagia relative to those seen with conventional planning. Other authors have suggested an alternative junctioned-IMRT (J-IMRT) technique, which matches an IMRT plan to a centrally-blocked neck field in order to restrict the dose to the larynx, thereby reducing the incidence of dysphagia. The achievable larynx dose with WF-IMRT incorporating laryngeal sparing in the optimisation has been evaluated and the technique compared with J-IMRT technique in terms of target coverage and OAR sparing.

Method and Materials:
WF-IMRT plans were created with and without the inclusion of laryngeal sparing in the optimisation for five head and neck oropharyngeal cancer cases. A comparison of target coverage and OAR sparing, including that of the larynx, was made using the resulting DVHs and dose distribution. A similar comparison was carried out to compare WF-IMRT and J-IMRT for the three of these plans in which disease did not extend to the level of the larynx.

Results:
Average mean larynx doses of 28.1Gy were achieved where disease did not extend to the level of the larynx and 40.9Gy for disease extending inferiorly and close to the larynx (reduced from 42.4Gy and 48.1Gy respectively without laryngeal sparing). Further sparing of the larynx can be achieved with J-IMRT (minimum mean dose 22.5Gy), although often at the expense of reduced coverage of the target volume and with no improvement to other areas of the IMRT plan.

Conclusion:
The inclusion of laryngeal sparing into the WF-IMRT optimisation gives comparable mean doses to the larynx with improved target coverage relative to J-IMRT. It is also effective in cases where disease extends inferiorly to the level of the larynx.