

CONFORMAL BOOSTS: Should they be included in one dose distribution or as an additional plan?

This study investigates options for conformal boosting when IMRT is used. A boost dose can be delivered as part of the standard dose distribution where the dose per fraction to the centre region is greater, or the boost can be delivered after the main treatment as has traditionally occurred.

The effects to the tumour, the acutely reacting normal tissues and the late reacting normal tissues have been assessed in this study using the Linear quadratic model. The effects to the tumour and early reacting normal tissues have been set to be the same as that which would be achieved for a standard treatment of 25, 2 Gy fractions and a following boost of another 5, 2 Gy fractions. These calculations have been performed with and without a proliferation factor. When proliferation is not included the advantage, to late responding normal tissues with included boosting, results when the total number of fractions to the large volume is extended to that delivered to the central boost volume. This changes when proliferation is included. For short potential doubling times a minimum in the late tissue BED curve results as a larger dose per fraction is necessary for long schedules. For this situation with a potential doubling time of 4 days, 25 fractions is the most advantageous for the late responding normal tissue in the central boost volume, while 20 fractions is the most advantageous for the larger volume.