

AbstractID: 5549 Title: Dose Mapping for interrupted Tomotherapy Treatments

Purpose:

To map out the dose delivered to a patient, when treatment is interrupted and not completed, several times while undergoing tomotherapy.

Method and Materials:

The patient data whose treatment had been interrupted 5 out of 25 fractions of 2 Gys was extracted. Two plans were used for patient treatment, plan 01 with field width of 1.06 cm and plan 02 with 2.49 cm field width. The data includes dose per fraction, total dose, total treatment time, t , duration of partial treatment, t_p , field width, FW; couch speed and coordinates of the first CT slice with the target delineated. The treated distance from the first CT slice with target delineated is given by,

$$\text{Distance treated} = ((t_p - 10.0s) \times \text{couch speed}) - \text{FW}$$

10s is the time needed for machine warm up and the couch does not move during this time. A field width distance needs to be subtracted to account for the start of treatment when the proximal edge of the beam hits the superior most slice that contains the delineated target. Since 100 % of the prescribed dose is delivered in each treated slice, the prescribed dose per fraction can be subtracted from the untreated area, hence reducing the total dose in the untreated area for every untreated fraction.

Results:

The composite plan is then produced based on the subtraction of dose from various untreated sections.

Conclusion:

This method serves as a simple and fast way of approximating the composite dose to a patient with single or multiple interrupted treatment fractions, which are not completed. However, a more accurate computer based calculation that takes, into account the scatter dose, leakage dose and the partial delivery of the modulated beams may be needed to provide more accurate doses mainly at the junction of interruption.