

AbstractID: 6765 Title: An assessment of the use of skin flashes in helical tomotherapy using phantom and in-vivo dosimetry

Background and Purpose : In helical tomotherapy the nature of the optimizing and planning systems allows the delivery of dose on the skin using a build-up compensating technique (skin-flash). However, positioning errors or changes in the patient's contour can influence the correct dosage in these regions. This work studies the behavior of skin-flash regions using phantom and in-vivo dosimetry.

Material and Methods : The dosimetric accuracy of the tomotherapy planning system in skin-flash regions is checked using film and TLD on phantom. Positioning errors of 5mm to 10mm in both directions are induced and the effect on the skin dose is measured. Further a volume decrease is simulated using bolus material and the results are compared.

Results : Results show that the tomotherapy planning system can does adequately calculates dose on skin regions within 2SD using TLD-measurements. Film measurements show drops of dose of 2.8% and 26% for resp. a 5mm and 10mm mispositioning of the phantom towards air and a dose increase of 9% for a 5mm shift towards tissue. These measurements are confirmed by TLD measurements on phantom. A simulated volume reduction shows a similar behavior with a 2.6% and 19.4% drop in dose, measured with TLDs.

Conclusion : The tomotherapy system allows adequate planning and delivery of dose using skin flashes. However, exact positioning is crucial to deliver the dose at the exact location and re-evaluation could be in order when patients will reduce in volume during their treatment.