

AbstractID: 1308 Title: An independent dose validation technique for TomoTherapy Hi*Art II tomo IMRT treatments

A dose validation scheme is described and proven for patients treated on the TomoTherapy Hi*Art II accelerator, using an independent computer, person and data. Based upon the successful validation of over 700 Peacock patients, an homogeneous, black acrylic, circular phantom containing XV type film is exposed to an actual patient treatment. The film is positioned to correspond to an axial slice on the treatment plan, which includes target as well as critical structures. To eliminate any effects due to the processor, the film is processed simultaneously with a calibration film, which is used to convert optical densities to radiation doses. To account for the difference in size and shape between the phantom and a patient, a phantom factor is derived for each dose point of interest within the distribution, based upon its radiological depth, beam weight, SSD, couch attenuation and TMR for each gantry increment of 7 degrees (51 projections per rotation). The entire process was checked using a 35 cm x 22 cm elliptical phantom to simulate a patient treatment and drilled to accept a Farmer type chamber. A calibrated ionisation chamber was surrounded by a volume planned as a target or RAR and the respective doses measured for each case. Using the circular XV film phantom the dose to the ionisation chamber was calculated. Ratios of measured doses to the treatment planner indicated doses were 0.998 and 1.03 respectively for the IC and film.