

An anthropomorphic head phantom for remote monitoring of stereotactic radiosurgery at multiple institutions

The Radiological Physics Center (RPC) has developed an anthropomorphic head phantom for remote monitoring of stereotactic radiosurgery (SRS) treatments. The phantom contains a 1.9 cm imageable target as well as TLD and radiochromic film dosimeters. The dosimeters measure dose at the center of the target and dose profiles along three orthogonal axes. This phantom has been provided to the community through the RPC and the Radiation Dosimetry Services (RDS) since 1995. Data from over 75 institutions was obtained. Agreement in dose at the center of the target, as determined by TLD, is similar to that for conventional photon beams. Eighty percent of the institutions centered prescription isodose lines on the target to better than 1.5 mm. However, institutions typically use generous margins around the target; irradiating a volume that is 25% - 125% larger than the target. Field localization by CT typically has higher precision in the coronal plane than in the sagittal plane, this was not observed for MRI based treatments. Our data suggest no significant difference in the central dose or localization precision between linac or Gamma-Knife; or in the immobilization system used. The anthropomorphic head phantom described has been found to be a useful remote monitoring tool.

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