

AbstractID: 8506 Title: Simplification to verify dose delivery accuracy using TLD and a head phantom for the Cyberknife system

A head phantom along with a custom made TLD cassette from Computerized Imaging Reference System (CIRS) is used to verify the dose delivery accuracy for the Accuray Cyberknife system. A GE Lightspeed CT was used with a slice thickness of 1.25 mm. The Harshaw microchips (1x1x1mm) are used with a Harshaw automatic TLD reader (model 5500). Spacing of the TLD holes in the cassette is 2 mm from center to center. Routine TLD QA testing done at our institute uses approximately 50 TLDs for a collimator size ranging from 12.5-20 mm, and the dose profile are obtained to determine the centroid of the dose. The advantage of using more TLDs is that it is possible to determine the shift of the centroid when comparing the dose profile from the planning system with the dose profile determined from the TLD array, although it is time consuming to analyze many TLDs. To simplify the verification procedure, fewer TLDs are used in this study (13) with a small collimator (5mm). The TLDs are arranged in three dimensions so that accuracy along right-left, anterior-posterior, and superior-inferior directions are checked at the same time. Treatment planning was done to deliver 800 cGy to the center of the TLD array. Although the results do not show the exact shifting of the targeting accuracy, the 2 mm TLD spacing allows us to determine a delivery accuracy of 0 to 1 mm. Results show that the beam is delivered to within 1 mm of the TLD array center.