

An isocentric teletherapy cobalt unit provides a viable alternative to an isocentric linac as a radiation source for radiosurgery. An AECL Theratron T-780 cobalt unit was evaluated for its potential use in radiosurgery in three areas: (1) the physical properties of its radiosurgical beams, (2) the quality of radiosurgical dose distributions obtained with 4 to 10 non-coplanar arcs, and (3) the accuracy with which the radiosurgical dose can be delivered. In each of these areas the 10 MV beam of the Varian Clinac-18 linear accelerator served as a standard for comparison.

The difference between the 80%-20% penumbras of the radiosurgical fields of the cobalt-60 and 10 MV photon beams is remarkably small, with the cobalt-60 beam penumbras on the average only about 0.7 mm larger than those of the linac beam. Differences between the cobalt-60 and 10 MV plans in terms of dose homogeneity within the target volume and conformity of the prescribed isodose volume to the target volume are also minimal, and therefore of limited clinical significance. Moreover, measured obtained isodose distributions of a radiosurgical procedure performed on the Theratron T-780 agreed with calculated distributions to within the  $\pm 1$  mm spatial and  $\pm 5\%$  numerical dose tolerances which are generally accepted in radiosurgery. The viability of isocentric cobalt units for radiosurgery would be of particular interest for centers in developing countries where cobalt units, because of their relatively low costs, provide the only megavoltage source of radiation for radiotherapy, and could easily and inexpensively be modified for radiosurgery.