

The dosimetric characteristics of a mini-MultiLeaf Collimator (mMLC) designed by BrainLab and Varian have been analyzed for single fields and multiple arcs of 6 MV x-rays. This add-on device has 26 leaf pairs ranging in width from 3.0 mm to 5.5mm and covering a maximum field size of 10 cm by 10.2 cm. For single circular fields of diameters between 10 and 40 mm Kodak XV film was exposed in polystyrene phantom. The RIT113 film analysis system was used to determine isodose contours and to compare with circular fields shaped by the tertiary stereotactic collimators. Deviations of the mMLC isodose contours from those produced by circulator collimators at several relative dose levels have been measured and found to be quite small (less than .6 mm). Of particular clinical interest are the dose distributions from multiple arcs shaped by the mMLC for spherical and irregular target volumes. The 90-30% distance characterizes the dose gradient or fall off in the "penumbral zone". These data along with assessment of the degree of conformity of the 90% isodose contour to the irregular volume will be presented. Analysis of dose uniformity within the target volume, via DVH, especially when compared to multiple isocenter circular stereotactic collimators shows the advantage of the mMLC. Results of radiochromic film placed in a water filled head phantom irradiated stereotactically with mMLC and circular collimators will be presented for irregular volumes.