

A stereotactic radiosurgery system consists of the collimators, patient positioning system, treatment unit, and dosimetry data. When a treatment unit changes, either through modifications or transfer to a new unit, the stereotactic system must be recommissioned to provide accurate dose delivery. At the University of Wisconsin, we recently transferred our treatments to a new linear accelerator, with slight modifications to the collimator attachment system, yet keeping the same collimators and patient positioning system. Instead of remeasuring all the data, we developed a strategic method to adapt existing data to the new system using select measurements. Correction functions were generated for all collimator profiles, output factors, and depth dose data. Treatment planning data was then modified using these functions. Verification of positional accuracy was within a millimeter and dose delivery better than one percent. Using this system saved a great deal of time and also provided valuable data on the physical aspects of the system, perhaps improving some of the data. For example, depth dose measurements for the smallest collimators are very difficult using ion chamber measurements in water because of noise problems for small chambers and partial volume effects for larger chambers. Instead, data for a larger collimator size can be adapted to represent a smaller collimator providing the correction function is accurate. This was accomplished using calibrated film measurements at a number of depths and correcting the depth dose curve accordingly.