

There are appreciable dose variations throughout the target volume when breast cancer patients are treated with the prevailing irradiation technique, tangential opposed fields. The technique we have developed uses multiple sets of MLC-defined fields to achieve more uniform dose distributions. Patients are immobilized and CT scanned from the lower neck to well below the breast tissue in the traditional arm up position. The target volume is delineated in 5mm CT slices. Standard tangential fields are designed with the aid of DRRs. The MLC, without collimator rotation, is used to shape the field. The wedges and relative weights of the beams are optimized to provide optimum uniformity. Many patients have dose inhomogeneity of 10% to 15%. For these patients, a second set of fields is designed. These fields have the same beam parameters but "treat" only the part of breast tissue that is "cool". Presently, the design of these fields is an iterative process. The weight of the original set of fields is reduced (usually ~90%) so that the "original hot" regions receive the prescription dose; the second set of fields delivers a supplemental dose to the "cold" region, typically ~10% of the total dose. The process can be extended to more than 2 sets of portals to obtain the desired dose uniformity. With these static MLC fields creating the intensity modulation, the dose uniformity to the breast is significantly improved and the hot spot in lung reduced. There is no increase in setup complexity nor in treatment time.