

There are several factors to consider when instituting a clinical transition to helical tomotherapy using the Hi-Art[®] system (Madison, WI) from sequential tomotherapy using the Nomos Mimic delivery system and the Corvus/Peacock planning system (Cranberry Township, PA). With respect to treatment planning, these factors are mainly defined by the physical aspects of the delivery systems. Helical systems use a combination of pitch and slice width that provide beamlet overlap to eliminate previous field matching problems and improve dose distributions. In addition, the arc length is increased in helical systems to create additional beamlet angles for treatment. These factors are important with regard to our prostate treatment method where we treat patients in the prone position with a rectal balloon to immobilize the prostate. Our current method uses 260 arc degrees and the exit dose into the rectal wall is reduced by the air cavity defined by the balloon. With helical systems, the rectal dose is modified since additional beamlets from the anterior entrance deposit dose into the rectal wall without buildup sparing. To make the clinical transition, the dose distribution resulting from helical delivery is required to be comparable to our clinical method. Part of the difficulty resides in the different dose algorithms between the two systems, especially with the restrictions placed on Hi-Art dose calculations which only use heterogeneity corrections. We will demonstrate that specific planning methods are required to attain better delivery than with the Nomos system.