

Purpose:

To compare different plan and delivery techniques with the Monaco Treatment Planning System (TPS) and identify which techniques achieve the goals of short treatment times and good DVHs.

Methods:

Monaco is an IMRT-only TPS that is capable of creating plans with step-and-shoot, DMLC, consolidated DMLC, and VMAT delivery techniques. We are using Monaco Version 2.04 and delivering treatment plans with an Elekta Infinity linear accelerator and Model MLCi2 multi-leaf collimator. In this study, a prostate case and a head and neck case are planned using each delivery method. The plan DVH and treatment times are compared to identify the best plan for treatment. Our department treats an average of 50-60 patients per day on a single accelerator, so shorter treatment times weigh heavily on the selection of the best treatment plan.

Results:

For the Head and Neck treatment plan, the DVH of a seven-field DMLC treatment plan was favored over the VMAT technique because of better target coverage. Furthermore, the treatment delivery time was faster with the DMLC than it was for the VMAT. Because of this, the DMLC plan was selected for its increased delivery efficiency and favorable DVH. For the prostate plans, the DVHs were comparable with each delivery method, but the treatment times were significantly shorter with VMAT delivery. The treatment times were 9 minutes, 6 minutes, 4 minutes, and 3 minutes for step-and-shoot, DMLC, consolidated DMLC, and VMAT, respectively. Because the DVHs were comparable, VMAT was selected for its increased delivery efficiency.

Conclusions:

Although VMAT is a faster delivery technique with a comparable DVH for prostate treatments, DMLC is chosen for a head and neck treatment. This study highlights the importance of analyzing the various delivery techniques available when using the Monaco treatment planning system to select the best treatment plan.