AbstractID: 13086 Title: Inclusion of MLC Leakage in Treatment Plans to Reduce Monitor Units and Treatment Time

Purpose: The efficiency of a treatment plan is extremely important to reduce a patient's time on the table. Decreasing the amount of monitor units to achieve a prescribed dose will directly decrease this time. In this regard, two techniques of IMRT treatment delivery were tested and compared. **Methods and Materials:** The variable technique, which is the standard method of IMRT for Elekta, allows the secondary collimator to vary for each segment minimizing the MLC leakage. In the static technique, the secondary collimator remains fixed at the largest MLC segment for that particular beam. An anthropomorphic phantom was treated for two types of cancer to analyze each technique. A typical head and neck PTV was placed on the phantom's CT as well as a typical cervical cancer. Each plan was optimized using static and variable techniques to either account for or minimize the MLC leakage. TLDs were placed throughout the treatment regions to confirm the treatment plans. Additionally, a study is presented for patients being treated for bilateral lungs in which static and variable plans were created and analyzed. **Results:** The static and variable techniques provide similar dose coverage for the regions of interest. The difference comes when the total monitor units are computed. For the cervical treatment the monitor units are decreased from 938 to 751. The head and neck case had a much more dramatic decrease from 1685 to 744. The bilateral lung cases will be presented to show when a static treatment cannot reproduce the DVH of a variable treatment. **Conclusion:** A method is presented here in which monitor units can be minimized while maintaining the integrity of the treatment. There are limitations to this technique and an example is shown to demonstrate the need to carefully analyze treatment planning for each patient. Research sponsored by Elekta corporation.