

## AbstractID: 13078 Title: Jaw tracking for intensity modulated arc therapy: is there an advantage?

**Purpose:** In recent years, many institutions have adopted the use of intensity-modulated volumetric arc therapy (such as RapidArc®). Currently, during the delivery of the RapidArc plan, the jaws are fixed allowing the possibility of radiation leaking in-between leaves and in-between the leaves gaps from opposite pairs. The purpose of this work is to evaluate the potential improvement in RapidArc plans dosimetry when plan delivery allows for jaw tracking. This work represents one of the first attempts to assess the usefulness of jaw tracking.

**Method and Materials:** We use the Eclipse and the new Varian Trilogy MX linac which allows jaw tracking during RapidArc delivery for both the X and Y jaws. We considered 5 head and neck patients. We set the collimator at 45° and 10° and generate plans with and without jaw tracking for comparison. Special attention is given to the low dose regions where more noticeable differences were expected.

**Results:** The movements of the Y jaws were significantly smaller than the X jaws particularly when the collimator is 10°. For 10° collimator, the jaws moved on average by 20% of the field size for the X jaws and only 2% of the field size for the Y jaws. The difference between X and Y jaw movement is not as pronounced in the 45° collimator plans. From the comparison of the isodose lines and DVH we found that there was no significant difference in the dose distribution with and without jaw tracking for either the target volumes or the critical structures.

**Conclusions:** No clinically significant difference was detected between plans with and without jaw tracking for the five cases. Currently we are analyzing more plans for other sites and with other geometries to improve the statistical significance of our conclusions.