

AbstractID: 7421 Title: Validation of a new serial tomotherapy IMRT system.

**Purpose:** To evaluate the function and accuracy of a new serial tomotherapy system.

**Method and Materials:** The new nomosSTAT IMRT system from Nomos Division of North American Scientific integrates several devices into one package. The new system removes the controller box from the Mimic collimator and transfers the functions to a computer placed in the accelerator control area linked to a touch-screen monitor inside the treatment room. The new system is connected to the CORVUS planning station by standard network cabling, eliminating the need to transfer a plan via disk. In addition to automating the multileaf collimator control functions, the AutoCrane table indexing device is now computer controlled.

The accuracy and reliability of the new system was validated. This included data transfer integrity, proper functioning of all controls, mechanical accuracy, and dosimetric accuracy. Multiple plans were transferred for both 1cm and 2cm treatment modes. Multiple table angle plans were also tested.

**Results:** The plan data was found to be transferred accurately in all cases. The function of each control was verified as well as the ability to recover from an error. The mechanical accuracy of the AutoCrane device was found to be better than 0.1mm for the In/Out direction and 0.4mm for the Left/Right direction. The gantry angle inclinometers were found to be accurate to within 0.5 degrees when compared to an independent digital level. Two plans for each delivery width were verified with ion chamber and film measurements. The ion chamber measurements were within 3% of expected. Film dosimetry showed that at least 93% of pixels agreed within 4%, 4mm criteria. Repeat measurement of individual plans agreed within 1%.

**Conclusion:** The new nomosSTAT system was therefore found to be acceptable for clinical treatment.

**Conflict of Interest (only if applicable):** Research sponsored by Nomos Division of North American Scientific corporation