

Purpose: To verify and validate an in-house developed procedure used to readily transfer treatment plans between two tomotherapy machines without the need to re-optimize the plan. Easy patient transfer between tomotherapy machines provides smooth patient flow in the clinic and reduces the time needed to complete patients' treatments as scheduled. It also reduces the possibility of introducing errors in the transfer of patients from one machine to another.

Method and Materials: Two tomotherapy Hi-ART machines: Tomotherapy I, running software version 2.1.0.2 and Tomotherapy II running software version 2.2.1.2 (TomoTherapy Inc. Madison, WI.). The Tomotherapy planning was used for comparing treatment plans. The Delivery Quality Assurance (DQA) module of the tomotherapy planning software was used to compare delivered dose to films within the Tomo phantom to the calculated dose from the plans.

Results: Comprehensive tests using film and ion chamber dosimetry show that the beam model is true representation of both machines within measurement uncertainty. DQA procedures show that transferred plans are delivered accurately within IMRT acceptable limits (3% of prescribed dose and 3mm distance to agreement).

Conclusion: Using this approach the two UW tomotherapy machines were found to be similar and can deliver the same treatment plan within tolerances acceptable by IMRT treatments. On several occasions, tomotherapy treatment plans were transferred between the two tomotherapy machines to avoid treatment cancellation. Tomotherapy treatment plan transfer is accomplished within a reasonable time frame (5-10 minutes per plan) without changing the final outcome of the plans.

Conflict of Interest and Disclaimer: R. Mackie has financial interest in TomoTherapy Inc., and potential conflict of interest. The procedure and methods presented here are solely developed by the University of Wisconsin physics for internal use. TomoTherapy Inc. did not participate in this study and they do not support or recommend the procedure presented here.