

AbstractID: 14074 Title: Experience On Using Modified CHECKMATE For Hi-Art Tomotherapy Daily QA

Purpose: To design a method utilizing a commercially available daily QA device to check the performance of the Hi-Art Tomotherapy unit. This method is simple for therapists to finish in a short time and also can check the output and energy of the machine as well as the laser and imaging precisions as recommended by Tomotherapy. The initial experience of using this method is also reported.

Method and Materials:

A CHECKMATE (Sun Nuclear Corp. Melbourne, FL) with one vented parallel-plate chamber at the center was used. BBs were added to serve as the markers to check the imaging precision and couch position accuracy. The 10 cm square markings and the BBs were also used to check the red laser movement accuracy. A procedure was designed to deliver 20s beam on time (~287 cGy) to the chamber with SSD = 85cm. This procedure was delivered first to check the output of the machine, then a Cerrobend plate of ~1.6 cm thick was put on top of the device and the procedure was delivered again. The ratio between the two readings was used to represent the energy of the machine. Results were compared with the monthly QA measurements and CT detector data measured by field service engineer (FSE) when available.

Results

Daily couch position variation was well within 1mm limit. The output measurements were in agreement with the monthly IC measurement as well as the CT detector data used by FSE. The energy measurements were consistent with the monthly QA data. When target was deteriorating, the FSE reported data had a different trend than the morning QA data.

Conclusions

The modified CHECKMATE provides a reliable and fast way to do daily check for Tomotherapy machine and can be easily done by a therapist