

AbstractID: 5411 Title: A simplified frame work using deep inspiration breath-hold (DIBH) for the treatment of left breast cancer with improved heart sparing

Purpose: To develop a simplified frame work using deep inspiration breath-hold (DIBH) for left breast treatment.

Materials and methods: The current version of Varian's RPM system was rarely used in amplitude gating mode, especially with breath hold. The major reason is that the breathing amplitude is much less reproducible than breathing phase. Further, the same signal captured by the infrared camera in simulation room and that in treatment room could be different in amplitude. In this study, we presented a simplified frame work to improve the reproducibility of patient's breathing amplitude. First, an aqua-plastic body mask of 1.0-1.5 in wide was made right before patient's simulation while the patient is in DIBH. The body mask was set at umbilicus right superior to the marker box. It will then be used to guide the patient herself for DIBH. The DIBH signal is also displayed on a computer monitor set close to patient, which is a duplicate display of the DIBH signal in the RPM computer. The patient can see her own signal and can therefore guide her breath such that relatively constant amplitude can be achieved.

Results: The frame work was tested by a few volunteers and all agree that the system is feasible for left breast treatment. The DIBH can last 15-35s with good constant amplitude. In case the captured amplitude is different in treatment room, the two gating threshold lines set in simulation can be adjusted overlay to the DIBH signal before treatment.

Conclusion: The system is feasible for the treatment of left breast cancer with DIBH. Further improvement can be made by wiring the gating cable through patient using two electrodes; one on patient's body and the other on the guiding mask so that the amplitude-gated CT scans and treatment can be actively controlled by patient herself.