AbstractID: 9422 Title: The use of video feedback for the improvement of respiratory gating radiation treatments

Purpose: Breath-hold respiratory gating is currently being used to improve the quality of radiotherapy, especially for sites subject to internal motion. One technical challenge that exists is patient regulation of respiration. Typically, the radiation therapist verbally coaches the patient during treatment. This may not be the most efficient or accurate practice, since the patient is receiving delayed commands based on secondary cues. As such, a video feedback system has been implemented. During treatment, a live plot of breathing amplitude versus time is displayed to the patient for first-hand adjustments.

Method and Materials: Varian's RPM system was used to track the patient's respiratory motion. i-O Display Systems' i-Glasses, a headset displaying video feed, was worn by the patient for visual feedback. The RPM software interface was displayed in this headset. Patients with treatment sites in the abdomen and thorax, such as lung, liver, and breast cancer, were of interest in this study. Those who were candidates for breath-hold gating treatment were selected for either video feedback or verbal coaching respiratory management techniques, based on the patient's physical and mental condition.

Results: The accuracy and efficiency of the video feedback system, using i-Glasses, was compared to the more conventional system of audio commands given by the therapist. Accuracy was based on the magnitude of motion within the threshold, while efficiency was based on beam-on time during a particular field of treatment.

Conclusion: Video feedback proved better accuracy and efficiency of treatment compared to audio coaching. However, not all patients were candidates for the video feedback system. Some patients did not understand what the plot of amplitude versus time meant. Some patients could not resolve the plot, due to poor eye sight. Other patients found the headset to be uncomfortable during treatment. These problems are currently being taken into consideration for future studies.