

AbstractID: 5540 Title: Video-coaching as a biofeedback tool to improve gated treatments

**Purpose:** Gated treatments using the Varian RPM-gating™ System include in a standard configuration a coaching tool based on voice commands (“breathe-in”/“breathe-out”) called audio-coaching. As this configuration does not include feedback information like amplitude and breathing period, there are limitations concerning respiration depth and breathing pattern. The aim of this study was to evaluate the impact of video-coaching as biofeedback to improve gated treatments of breast cancer.

**Method and Materials:** Varian RPM-gating system is used for acquisition of the CT-Scan (4D-CT) as well as the treatments; for the latter it manages the controlled switching of the radiation beam during a pre-selected specific phase of the respiratory cycle. 100 patients with gated treatments have been analyzed, whereas 50 were only audio-coached and 50 audio-coached with video-feedback. We evaluated periodicity and amplitude changes as well as compliance with regard to the theoretically calculated duty cycle and determined the dependency of the parameters on the coaching type.

**Results:** For the CT acquisition several changes has been observed, i.e. amplitude fluctuations are significantly smaller ( $p=0.005$ ) and the breathing curves are smoother. This leads to an increased compliance during the treatment course: almost all video-coached patients reached in average their theoretical duty cycle, whereas 60% of the patients with audio-coaching only had more than 25% longer treatment times due to inappropriate amplitudes. Periodicity is not dependent on the kind of coaching ( $p=0.01$ ).

**Conclusion:** Video-coaching is suitable to significantly improve the quality of 4D scans and allows optimizing the treatment time due to better compliance. In a next step we are currently implementing this feedback technology combined with deep inspiration breath hold technique thus allowing the patient to control the treatment themselves in a direct way. Preliminary results indicate that this approach could suit the individual patient need in a better way.