

AbstractID: 4586 Title: Breath coaching with visual feedback for end-expiratory gated radiotherapy

Purpose: To determine if breath coaching to maintain a consistent breathing amplitude at expiration is feasible in a clinical setting.

Method and Materials: This technique consists of two phases of observation and active breathing to restrict the end-expiratory phase so as to never exceed the lower limit of the gate. The first phase consists of 2 minutes of observation followed by 3 minutes of active breathing using visual feedback, while the second phase consists of 2 minutes of observation followed by 8 minutes of active breathing again using visual feedback. The purpose of the 2-minute observation periods is to set the end-expiratory gate at a comfortable level for the patient. Following the first phase the patient assesses whether the lower limit of the gate is appropriate and if it can be maintained in a reproducible manner for an extended period without exhaling below the gate.

We have studied ten healthy volunteers of varying ages. The RPM system (Varian) was used to monitor the respiratory cycles of the volunteers. The volunteers self-monitored their respiration via goggles that were turned on following each 2-minute observation period.

Results: The visual feedback was the key factor to reproducibly maintain the end-expiratory gate. We were able to determine that all subjects were successful in sustaining their breathing pattern such that they did not exceed the lower limit of the gate and they were all able to do so comfortably. Only one volunteer would have needed to have the gate shifted upwards for actual treatment delivery. Only one volunteer would have needed to have the gate shifted upwards for actual treatment delivery.

Conclusion: Breath coaching to maintain a consistent expiratory amplitude is feasible. It should not place a heavy burden on the patient during respiratory-gated radiotherapy.