

AbstractID: 7192 Title: A PC-based multiple respiratory sensor system for the correlation study with an organ motion

Purpose: To acquire various respiratory signals simultaneously from a spirometer, a belt transducer and a CCD camera for the correlation study with organ motion

Method and Materials: A PC-based sensor monitoring system was developed to acquire signals from the multiple respiratory sensors. The system incorporated a data acquisition board featuring a 16-bit A/D converter. Respiratory signals generated by a spirometer and a belt transducer were fed into the board. Patient surface markers were imaged by two IEEE-1394 cameras for obtaining 3-D positions of surface markers. The respiratory signals were displayed in real time after correction for zero-drift and time integration for tidal volume. Fluoroscopic imaging was performed to assess the correlation of each respiratory signal with a variety of organ motion.

Results: A multiple respiratory sensor system was implemented with the DAQ board and PC-based program. A phase delay of around 0.2 second was observed between the spirometer and the belt transducer signal. Software triggered digital output was provided for gating a LINAC.

Conclusion: A multiple respiratory sensor system is feasible using a PC-based data acquisition technology. The system is flexible in implementing a post-processing algorithm for a stabilized respiratory signal and can evaluate the correlation of a different kind of respiratory signal with a specific organ motion.