Purpose: The purpose of this study is to evaluate the clinician’s perspective of amplitude versus phase-based binning of four-dimensional computed tomography (4DCT).

Methods: Ten random lung cancer patients were selected with 10-phase binned 4DCT’s acquired on a Philips BigBore (Philips Healthcare, Andover, MA). The data was re-binned using the amplitude of the respiratory signal and a new 10-phase 4DCT dataset was generated. These two datasets were coregistered and shown together for each patient in cine mode in MIMVista (MIM Software, Cleveland, OH). Nine clinicians were shown the images and asked to determine if one dataset was more clinically beneficial or if there was no difference. The clinicians were blinded to the nature of each dataset and to each other’s responses. The data were tabulated using a point system where each patient was given +1 point if the amplitude binned image was selected, -1 point if the phase binned image was selected, and 0 points if they looked the same.

Results: The results showed large variations from patient to patient. Scores ranged from -7 to 9 with a mean score of -0.7 indicating a very small preference toward the phase-binned datasets. For one patient, all of the clinicians selected the amplitude binned dataset. For two patients, no clinicians selected the amplitude binned dataset. The mean percentage of responses per patient that favored the amplitude binned dataset was 27.8% and the phase-binned dataset was 35.6%. No difference was detected in 36.7% of responses.

Conclusions: It is not clear from our limited data that clinicians prefer amplitude or phase binned datasets for a random selection of lung cancer patients. This suggests that patients could benefit on a case-by-case basis depending on breathing pattern.