Clinical Evaluation of Positioning Accuracy of Two Immobilization Devices for Stereotactic Body Radiotherapy using Cone Beam CT

A. Innovation/Impact
The purpose of this study is to evaluate the patient positioning accuracy of two commercially available immobilization systems for SBRT.

B. Results
The systematic setup errors of the two body frames system are plotted for the lung and liver groups, respectively, in figure 1. The systematic setup errors are comparable (p>0.05 in all three translational directions) between the two frames for both groups.

The random setup errors of both frames were compared in figure 2 for the lung and liver groups, respectively.

The histograms of the daily couch corrections based on CBCT guidance are plotted and compared for SBF and MIF for the liver group in figure 3. Similar trend is also observed in the lung group.

Repeated CBCTs occurred in 42.4% and 40.7% of the lung and liver treatment fractions to verify the large couch corrections based on the institutional tolerance when the MIF system was used, resulting in prolonged setup time. Only 25% and 13.6% of the fractions of the lung and liver groups required repeated CBCT.