

Effect of Dynamic Workstation Use on Radiologist Detection of Pulmonary Nodules on CT



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THE HEALTH SCIENCES



ACR 2017 ANNUAL MEETING

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No financial disclosures

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Purpose



- Sedentary lifestyles increase cardiovascular and all-cause mortality. Diagnostic radiologists have one of the most sedentary working environments in medicine.
- Increasing radiologist physical activity would have far reaching personal health implications.
- Ways to increase radiologist physical activity such as by using dynamic exercise workstations have been gaining popularity.

Purpose



- The effects of these dynamic workstations on radiologist accuracy and speed have not been examined in depth.
- This study was designed to analyze the effects of radiologists utilizing a dynamic treadmill workstation to increase physical activity on accuracy and interpretation of pulmonary nodules.

Materials and Methods



- This project was HIPAA compliant and approved by the NMCP IRB (Protocol: NMCP.2016.0095).
- Three radiologists performed a retrospective review of 55 CT exams of the chest originally obtained for lung cancer screening in patients at increased risk of lung cancer.
- These studies were reviewed both while sitting at a routine workstation and also while walking at a dynamic treadmill workstation at a speed of 1.5 miles per hour.
- The number of pulmonary nodules detected was recorded and compared between each condition.

Materials and Methods



- Further analysis included a breakdown of the number of solid nodules vs the number of subsolid nodules detected between each condition
- The interval between the sitting and walking conditions was set at least 2 weeks apart.
- Follow up recommendations and the time required to complete each examination were analyzed and compared between the two conditions in order to evaluate any impact that a dynamic workstation had on interpretation.

Results



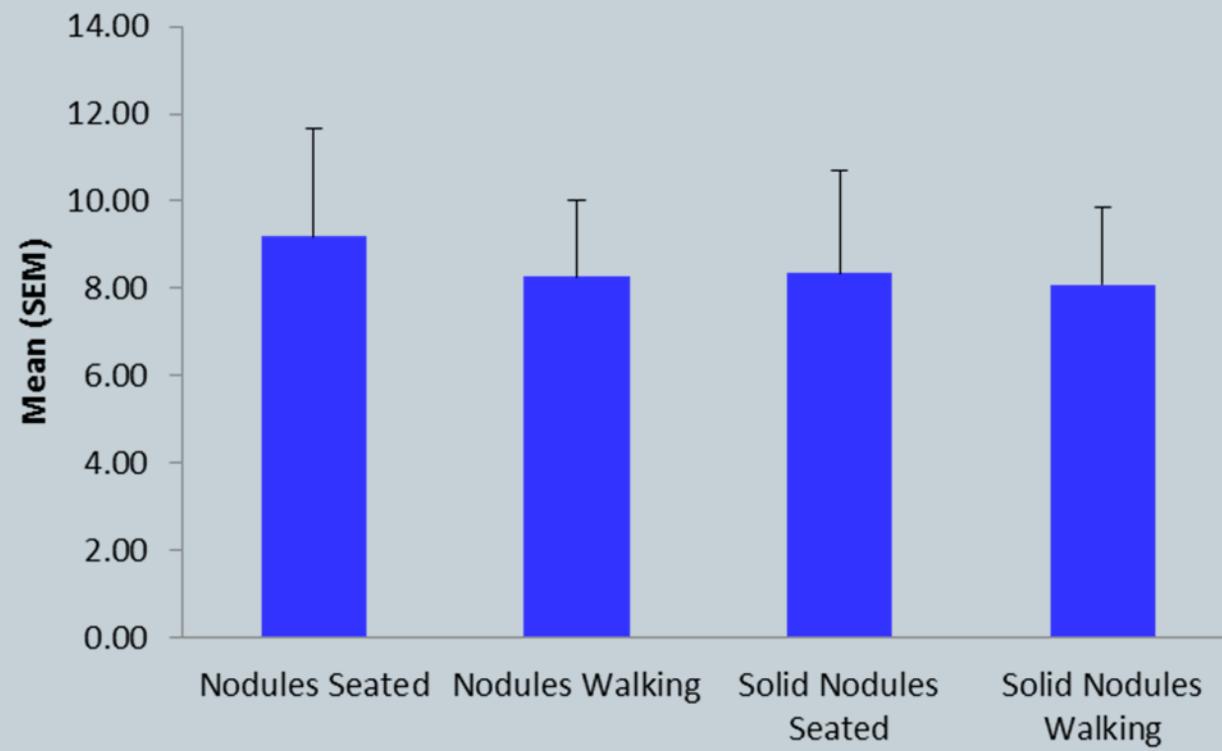
- There was no statistically significant difference in the number of nodules detecting while walking versus seated, with a mean of 0.93 more nodules detected per study while seated ($p=0.426$).
- Similarly, there was no statistically significant difference in the number of solid nodules detected between walking and sitting with a mean of 0.28 more nodules detected while seated ($p=0.793$)

Results



- Intraobserver follow-up recommendations were considered consistent to highly consistent between sitting and walking (Cronbach alpha values of 0.943 for reader 1, 0.946 for reader 2, and 0.812 for reader 3).
- There was moderate interobserver agreement between the reviewers' recommendation for seated vs walking conditions with a Cohen's kappa value of 0.555 ($p<0.001$)

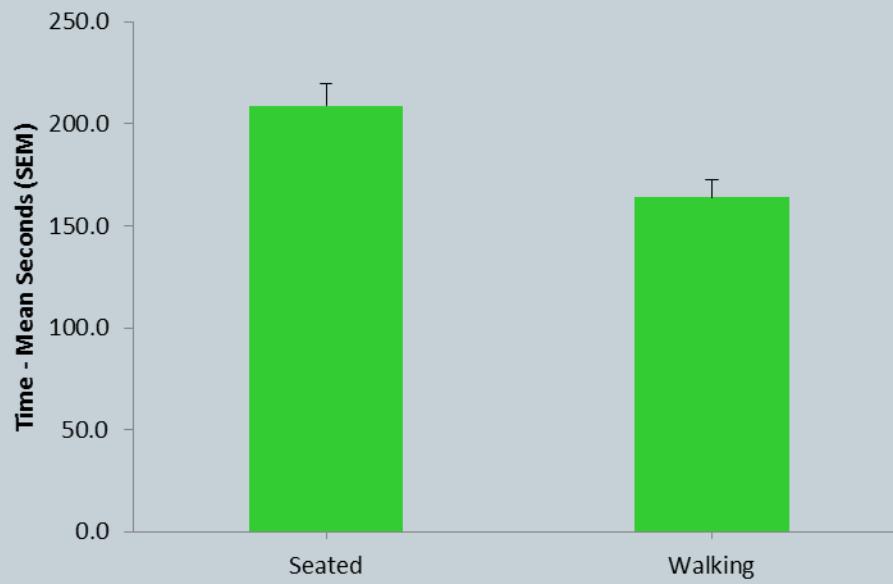
Results



Results



- The mean interpretation time per CT was 0.75 minutes shorter while walking ($p < 0.001$).



Conclusions



- There was no significant difference in detection of total number of pulmonary nodules or resultant nodule follow up recommendations between sitting versus walking at a dynamic workstation.
- Unexpectedly, there was a significant difference in time taken to complete each examination, with interpretation during walking taking less time than sitting.

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