



RESPIRATORY TECHNOLOGY

Diagnostic potential of oscillometry: a population-based approach

Summary of the main findings

Diagnostic Potential of Oscillometry: A Population-based Approach

 Chiara Veneroni , Christoph Valach , Emiel F.M. Wouters , Alessandro Gobbi ,  Raffaele L. Dellacà , Marie-Kathrin Breyer , Sylvia Hartl ; ; Owat Sunanta , Charles G. Irvin , Caspar Schiffrers , Pasquale Pio Pompilio , and  Robab Breyer-Kohansal ; ... [Show less](#)

LEAD study: clinical impact

Detection and Monitoring

Oscillometry is a tool for detecting and evaluating abnormalities of respiratory mechanics that are not seen by spirometry, even in subjects with symptoms, providing an opportunity for monitoring of respiratory conditions.

Complementary Diagnostic Tool: Integrating oscillometry with spirometry measurements allows for the identification of an additional 17% of the population with symptoms/diagnoses and abnormal lung mechanics.

Small Airways Assessment: Oscillometry's higher sensitivity than spirometry to small airways involvement, in conditions such as COPD and asthma, which may not be fully seen by spirometry.

Clinical Utility outside hospital labs: *"Oscillometry can be particularly valuable in situations where spirometry cannot be performed, or outside major academic centers where the quality of spirometry can be poor and technicians as well as patients would prefer not to perform the test."*

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Main findings:

- General population 18-90 years: 7.560 subjects
- 20% the adult population have abnormal oscillometry parameters, 13% of the adult population have abnormal spirometry
- Xrs is more sensitive indicator of symptoms and diseases compared to Rrs
- Expiratory abnormalities are related to the presence of only one symptom while inspiratory alterations are more likely to be seen in subjects experiencing multiple symptoms or with a diagnosed disease
- Abnormal oscillometry alone identified 587 (27.0%) of subjects with respiratory symptoms or diagnoses.
- Abnormal spirometry alone identified 483 (22.2%) subjects with respiratory symptoms or diagnoses.
- The combination of oscillometry with spirometry identified 840 subjects (38.7%) with respiratory symptoms or diagnoses.
- Such findings stand true even in subjects experiencing respiratory symptoms but with normal spirometry!

“Our results also revealed that the odds of having symptoms or diseases were similar for subjects with abnormal AX and X5, and that AX and X5 are strongly correlated”

“The addition of Ax and R5-19 add little information compared to Xrs 5Hz, making possible the development and use of simpler and portable device in large scale screening applications.”

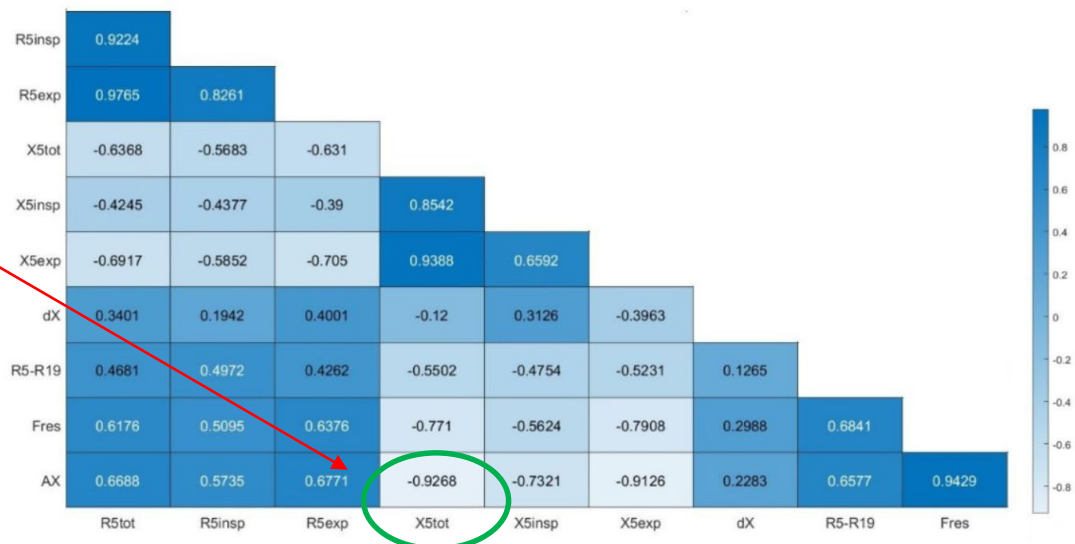
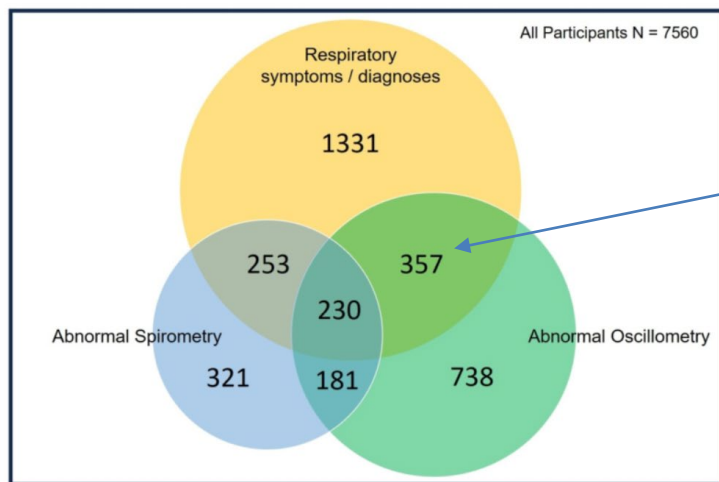


Figure S2. Spearman's Rho correlation coefficient heatmap for oscillometry parameters. P-values < 0.00001 for all the correlations reported.



“If oscillometry is used in combination with spirometry, the increase of the detected abnormalities of lung mechanics is +17%”

FULL PAPER PDF available on line :

<https://www.atsjournals.org/doi/epdf/10.1164/rccm.202306-0975OC?role=tab>

Figure 2. Venn diagram of participants with respiratory symptoms/diagnoses, abnormal spirometry and abnormal oscillometry.

LEAD study: journal editorial

American Journal of Respiratory and Critical Care Medicine

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Real World Application of Oscillometry: Taking the LEAD

[Previous Article](#)

David A. Kaminsky

“How does this study influence the evidence supporting a clinical role for oscillometry?”

First, it is the largest epidemiological study to date to relate oscillometry to respiratory symptoms and diagnoses in a general population across a wide age range (18-90 years). The forest plots of odds ratios show clear association between increased odds of abnormal oscillometry as the number of symptoms increases or respiratory disease is present, even in those with normal spirometry

...together these two studies validate the clinically relevant diagnostic potential of oscillometry, even when spirometry is normal.

*Second, the results provide insight into the potential mechanisms of symptoms and disease... **These are insights that cannot be gained by routine spirometry.***

Third, this study provides practical guidance on how we might simplify reporting oscillometry. ...Even though AX may be a more robust parameter, since it integrates data from multiple frequencies, X5 may be sufficient, allowing oscillometry to be useful at just a single frequency. “