

ATS 2025 Highlights

Respiratory Structure and Function Early Career Professionals



Riaz Hussain, M.Phil., PhD

Research Fellow

Center for Pulmonary Imaging Research

Cincinnati Children's Hospital Medical Center

riaz.hussain@cchmc.org

<https://www.linkedin.com/in/riazhussain17/>

Get to know members of the RSF Assembly

Is your research clinical, basic science or translational?

Translational and clinical

Tell us about your research?

My research focuses on advancing hyperpolarized Xenon-129 MRI for assessing lung ventilation in cystic fibrosis (CF) and other pulmonary diseases. Considering my technical background, I am developing robust pipelines for image reconstruction, bias correction, and quantitative analysis—particularly for deriving Ventilation Defect Percentage, a key biomarker of regional lung function. Recently, I've been exploring red blood cell oscillations from the Xenon gas-exchange signal to identify disease biomarkers.

Where do you see yourself in 5 years?

In five years, I see myself continuing to advance technical aspects of imaging research, particularly in pulmonary diseases. Whether in academia or industry research setting, I aim to lead efforts that integrate imaging science, physiology, and data analytics to refine diagnostic tools and improve patient outcomes.

What do you find is the major benefit of RSF Assembly Membership?

The RSF assembly provides a unique platform for networking with both emerging and established researchers in the field, fostering valuable connections.



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If you or someone you know would like to be featured as an ATS RSF ECP please email Carolyn Wang (carolyn.wang@hli.ubc.ca)

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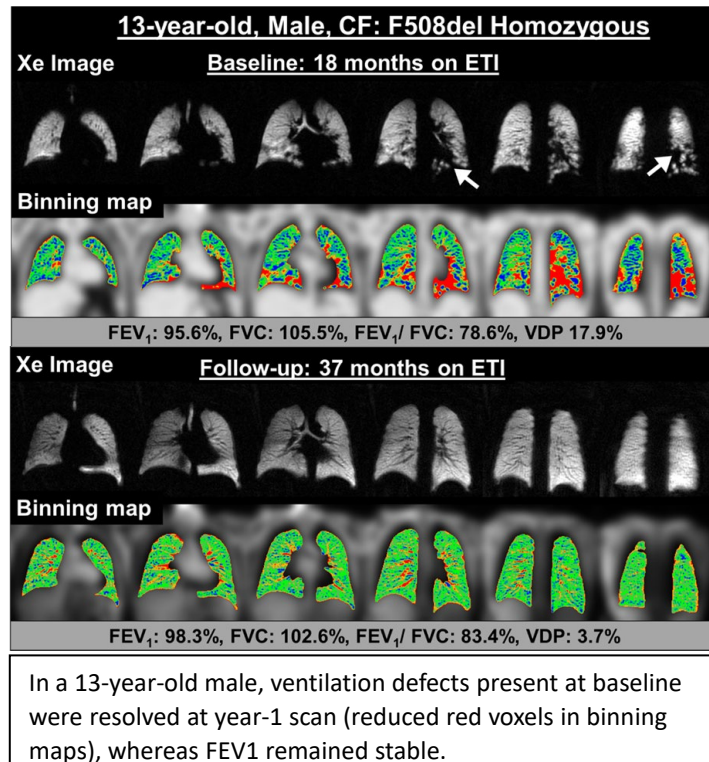
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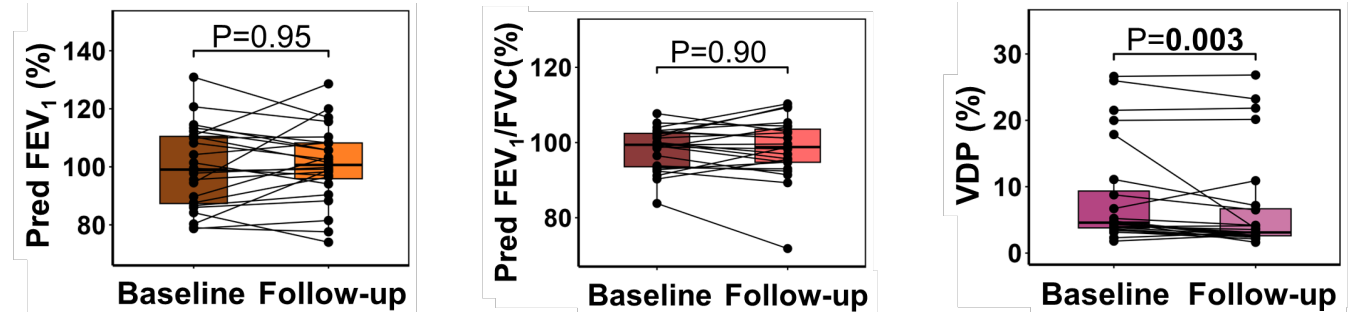
Continued Lung Ventilation Improvement in People with Cystic Fibrosis Receiving Highly Effective Modulator Therapy

Objective: To evaluate one-year changes in spirometry and hyperpolarized Xenon-129 (¹²⁹Xe) ventilation MRI in people with cystic fibrosis (pwCF) maintained on elexacaftor/tezacaftor/ivacaftor (ETI) therapy for ≥6 months prior to study.

Methods: Twenty-four pwCF underwent ¹²⁹Xe MRI and same-day spirometry at baseline and at 1-year follow-up (13 ± 2 months). Baseline imaging occurred 22 ± 8 months (range: 6–35 months) after ETI initiation. MRI data were quantified using median-normalized generalized linear binning with an age-matched healthy reference cohort (N=25). Ventilation defects were defined as voxels with signal < μ – 2σ, and Ventilation Defect Percentage (VDP) was calculated as the proportion of defect voxels within the lung parenchyma.

Results: VDP correlated negatively with FEV₁ and FEV₁/FVC at both timepoints. However, changes in VDP did not correlate with changes in spirometry. ¹²⁹Xe MRI detected significant ventilation improvements over one year (P=0.003), which were not captured by spirometry (P>0.05), suggesting continued functional recovery under ETI therapy.

Conclusion: Xe MRI is highly sensitive to therapeutic efficacy in pwCF, allowing treatments to be optimized and individualized.



For the entire cohort, no difference was detected in FEV₁ and FVC between baseline and Follow-up scans, while VDP significantly decreased between the two scans (i.e., improvement in lung function).