Get to know members of the RSF Assembly

Is your research clinical, basic science or translational?
Translational

Tell us about your research?
I am an MRI physicist, with research interests in the development and application of pulmonary MRI methods. One of my areas of emphasis is the use of hyperpolarized ^{129}Xe MRI to better understand diseases of the pulmonary parenchyma and vasculature, such as PAH, ILD, and post-acute COVID-19.

Where do you see yourself in 5 years?
I aim to continue the growth of the hyperpolarized ^{129}Xe MRI program at the University of Kansas Medical Center, with a goal of becoming a center of excellence for the technology. I hope to continue developing my research lab toward creating new imaging technologies and applying imaging toward a better understanding of respiratory health.

What do you find is the major benefit of RSF Assembly Membership?
The RSF Assembly provides me a "home" in the ATS. As a physicist, my research is often far afield from traditional pulmonary biology research. In the RSF assembly, I have a community of like-minded scientists with whom I can network, share my research, and receive mentorship.

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ATS

Peter Niedbalski, PhD
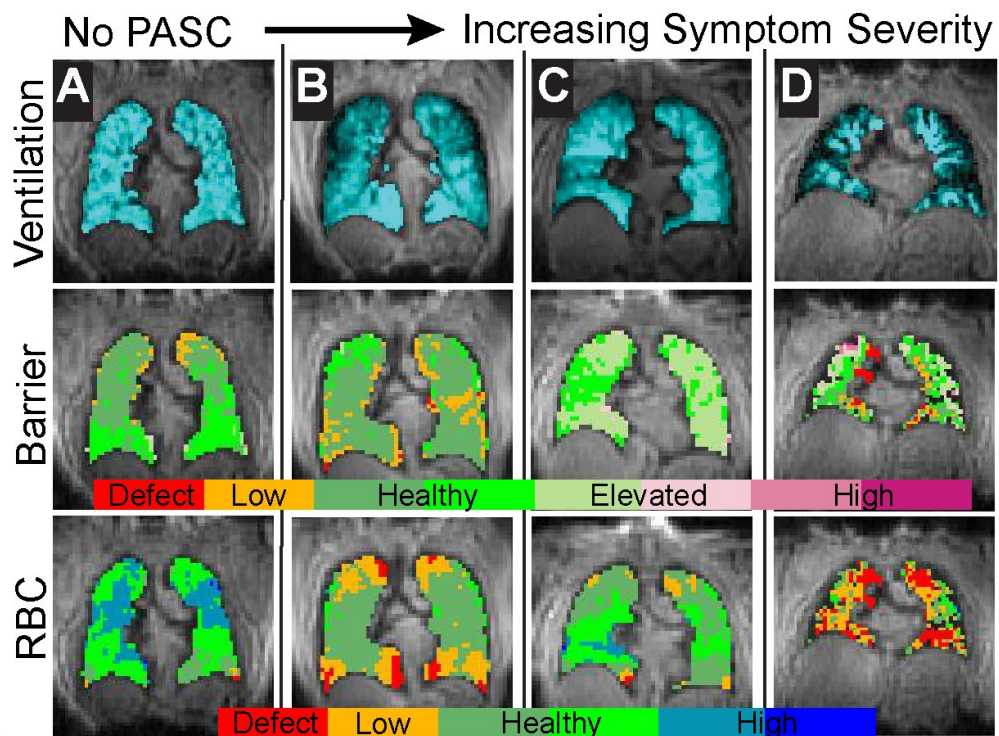
Research Assistant Professor
Division of Pulmonary, Critical Care, and Sleep Medicine
University of Kansas Medical Center

No PASC → Increasing Symptom Severity

Ventilation | Barrier | RBC

Defect | Low | Healthy | Elevated | High

Defect | Low | Healthy | High

Hyperpolarized ^{129}Xe MRI in Post-Acute Sequelae of COVID-19 (PASC)

Objective: In this study, we aim to quantify the regional pulmonary functional impairment of patients with respiratory post-acute sequelae of COVID-19 (PASC) that are poorly explained by pulmonary function testing and CT imaging.

Methods: We imaged 11 patients with post-acute COVID-19 using hyperpolarized ^{129}Xe ventilation and gas exchange imaging. These patients have included 9 patients recovering from mild/moderate COVID-19 and 2 recovering from severe COVID-19 at variable time from resolution of acute illness (288 ± 155 days from acute COVID-19 resolution). Imaging results were compared to a cohort of 6 healthy volunteers.

Results:. There was no significant difference in hyperpolarized ^{129}Xe ventilation defect percentage (VDP) between healthy and PASC subjects (p = 0.19), though ventilation heterogeneity was significantly different between groups (p = 0.04). PASC patients exhibited significantly reduced RBC/Barrier ratio (p = 0.006) and mean xenon signal dissolved in RBCs (p < 0.001).

Conclusion: Hyperpolarized ^{129}Xe MRI appears to be sensitive to functional impairment in patients with post-acute COVID-19 respiratory symptoms. Patients with respiratory PASC exhibit elevated ventilation heterogeneity, reduced signal dissolved in red blood cells, and reduced RBC/Barrier ratio.

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