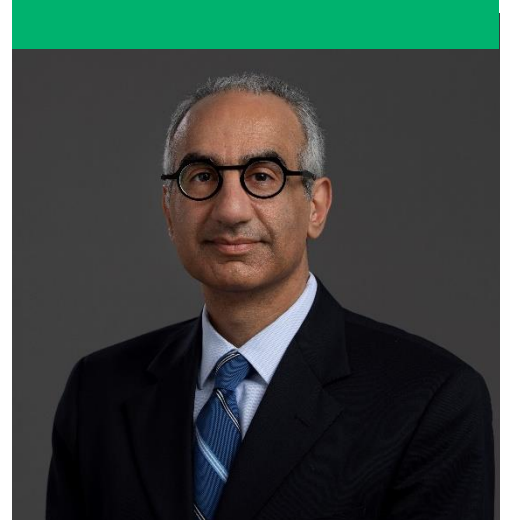


# **Babak Mokhlesi, MD, MSc**

The J. Bailey Carter, MD, Professor of Cardiology



## **Advancement of Medicine**

In 2024, I continued investigations relating to my area of expertise in the field of sleep-disordered breathing and hypoventilation syndromes. My clinical research explores the impact of sleep and obstructive sleep apnea (OSA) on type 2 diabetes and prediabetes as well as the intersection of sleep-disordered breathing and various pulmonary/critical care disorders such as acute-on-chronic hypercapnic respiratory failure in the ICU (i.e., obesity hypoventilation syndrome). Since my arrival at Rush in late 2021, I have been collaborating with Rush scientist Sanda Predescu, PhD, to better elucidate whether obesity and sleep apnea are risk factors in pulmonary hypertension. Pulmonary arterial hypertension, or PAH, is a life-threatening progressive disorder associated with abnormally elevated pulmonary pressure, pulmonary artery remodeling and occlusion of small pulmonary arteries. There is currently no cure. Even with treatment, the prognosis of PAH is poor, with a one-year mortality of 15%. Common comorbidities in patients with PAH include obstructive sleep apnea (OSA) and obesity.

## **Research**

Funds from the J. Bailey Carter Endowment support key laboratory personnel and equipment purchases and maintenance. This enables us to carry out translational research using murine models to explore the role of obesity and exposure to low levels of oxygen in the progression of pulmonary arterial hypertension. We have developed and perfected the animal model to gain a deeper understanding of disease mechanisms.

## Grants

We plan to submit a multiple principal investigator NIH R01 application based on the preliminary data we have accumulated. I am also collaborating with colleagues at multiple sites in the U.S. to obtain a PCORI grant exploring the role of the medication tirzepatide in patients with sleep apnea.

## Presentation and Speaking Engagements

- 2023 NIH/NHLBI-sponsored workshop: Sleep Health and Dysfunction Across the Spectrum of Pulmonary Vascular Disease (PVD). My task: "Positive Airway Pressure interventions in PH, which populations, which outcomes?"
- 2023 Harvard Clinical Sleep Medicine Grand Rounds: "Obesity Hypoventilation Syndrome: Lessons learned from the Pickwick Papers"
- 2024 SLEEP 2024: Session: Navigating Respiratory Physiology in the Sleep Lab: Obesity hypoventilation syndrome
- 2024 Meet the Professor session at CHEST 2023. Obesity hypoventilation syndrome. Boston, MA
- 2024 Scientific symposium CHEST 2024: Obesity Hypoventilation Syndrome: A Wicked Tough Challenge: Outpatient management. Boston, MA
- 2024 Sleep Medicine Review for the Pulmonary Boards at CHEST 2023. Boston, MA
- 2024 Scientific symposium CHEST 2024: Case-Based Presentation of New CMS NIV Reimbursement Criteria: Singin' the Respiratory Assist Device Type Rules. Boston, MA
- 2025 Visiting Professorship at MetroHealth/Case Western and Department of Medicine's Rammekamp Visiting Professor Grand Rounds

## Publication Highlights – Abbreviated

- "Obstructive Sleep Apnea, Obesity Hypoventilation Syndrome, and Pulmonary Hypertension: A State-of-the-Art Review." *Sleep Medicine Clinics*. June 19, 2024.
- "Interactions of Obstructive Sleep Apnea With the Pathophysiology of Cardiovascular Disease, Part 1: JACC State-of-the-Art Review." *Journal of the American College of Cardiology*. Sept. 24, 2024.

- “Treatment of OSA and its Impact on Cardiovascular Disease, Part 2: JACC State-of-the-Art Review.” *Journal of the American College of Cardiology*. Sept. 24, 2024.
- “X-inactive-specific transcript: a long noncoding RNA with a complex role in sex differences in human disease.” *Biology of Sex Differences*. Dec. 5, 2024.
- “Home oxygen after hospitalization for COVID-19: Results from the multicenter OXFORD study.” *Respiratory Care*. Feb. 28, 2024.
- “Association of Undiagnosed Insomnia With Objective Sleep and Clinical Outcomes Among Hospitalized Patients.” *Journal of Clinical Sleep Medicine*. May 1, 2024.
- “The Association of Self-Reported Sleep and Circadian Measures With Glycemic Control and Diabetes Complications Among Young Adults With Type 2 Diabetes.” *American Journal of Physiology-Heart and Circulatory Physiology*. June 2024.
- “Dysregulation of the Long Noncoding RNA X-Inactive-Specific Transcript Expression in Male Patients with Pulmonary Arterial Hypertension.” *American Journal of Pathology*. May 3, 2024.
- “The impact of neck circumference on hypoglossal nerve stimulator therapy outcomes.” *Journal of Clinical Sleep Medicine*. Nov. 1, 2024.
- “Gender differences in outcomes of ambulatory and hospitalized patients with obesity hypoventilation syndrome.” *CHEST Journal*. Jan. 16, 2025.
- “Physicians-in-training and advanced practice providers perceptions in managing perioperative obstructive sleep apnea: A multi-institutional survey.” *Journal of Clinical Sleep Medicine*. 2024. (E-publication ahead of print).



## The Year Ahead: 2024 and Beyond

We will continue our translational research to elucidate the mechanisms by which obesity and intermittent hypoxia (a model of sleep apnea) lead to pulmonary hypertension. We will continue to support our two PhD students, **Kanika Sharma** and **Heaven Wade**, who are both early in their PhD process. Last year, our PhD candidate, **Brandon Carman**, received his PhD.

## With Gratitude

I want to convey my sincere thanks for your generosity, which is helping us develop the necessary research to better understand the mechanisms by which obesity and sleep apnea can worsen patient outcomes in pulmonary hypertension, a deadly and progressive disease.