



Editorial

Pulmonary Hypertension: Updates in Diagnosis and Management

Estefania Oliveros ^{1,*}, Anil Jonnalagadda ²  and Anjali Vaidya ² 

¹ Department of Cardiology, New York Presbyterian Hospital/Columbia University Medical Center, New York, NY 10032, USA

² Division of Cardiovascular Disease, Department of Medicine, Temple University Hospital, Philadelphia, PA 19140, USA

* Correspondence: eo2578@cumc.columbia.edu

Pulmonary hypertension (PH) management requires thoughtful evaluation from the clinicians. This is a new era of new diagnostic criteria, medications, and modifications of the risk stratification [1]. In this edition we provide the reader with an overview of updated data for practical implications and incorporation in their daily practice. We have collected relevant studies from investigators that work within this space.

Over the last 2 centuries, medicine has rapidly evolved and the medical landscape has expanded fast, leading to the evolution of specialization and sub specialization. As we amplify our knowledge with also focus more to create clinical and research advances in specific areas. When we examine the data on right heart failure mortality, large amount of interest in reduction of mortality and heart failure hospitalization has led to multiple clinical trials and new medications to improve outcome.

What updates are in this issue?

1. Use of intravenous diuresis in cases of severe precapillary PH, and teach the reader the importance of cautious diuresis in the setting of preload dependence to avoid renal injury and hemodynamic compromise.
2. The significance of partial pressure of carbon dioxide and need to use blood gas analysis in the risk stratification of individual with pulmonary arterial hypertension.
3. Sleep related breathing disorders in patient with chronic thromboembolic pulmonary hypertension, and report the importance of early interventions in this group.
4. A novel finding in obesity and the relationship of VE/VCO₂ using invasive cardiopulmonary exercise testing in chronic thromboembolic pulmonary disease.
5. There are 5 reviews that include:
 - a. The relationship of pulmonary hypertension and the importance on rhythm control strategies in arrhythmias
 - b. The use of exercise testing in the risk assessment of patients with PH
 - c. A narrative review of underrepresented minorities in PH, and steps to mitigate disparities
 - d. Description of post-capillary PH and practical considerations in the setting of limited and conflicting data
 - e. And we finalize with a practical summary for the primary care physician for the diagnostic evaluation of patients with PH

Is there a need?

Pulmonary arterial hypertension patients treated at a Pulmonary Hypertension Care Center accredited by the Pulmonary Hypertension Association have improved survival



Received: 11 March 2025

Accepted: 20 March 2025

Published: 31 March 2025

Citation: Oliveros, E.; Jonnalagadda, A.; Vaidya, A. Pulmonary Hypertension: Updates in Diagnosis and Management. *J. Clin. Med.* **2025**, *14*, 2400. <https://doi.org/10.3390/jcm14072400>

Copyright: © 2025 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

and fewer hospitalizations. Patients are more frequently prescribed vasodilators, leading to better outcomes. The biggest barriers include monitoring disease progression, complex treatment regimens and side effects of drug-drug interactions. Teaching and sharing our knowledge with the primary care physicians will allow for patients to have expedited diagnostic testing, and referrals.

Consensus statements among pulmonary hypertension experts endorse early and accurate diagnosis and management of PH to improve patient outcomes. Patients often present in late stages, with a rare disease and there is struggle to provide treatment and identify the PH phenotypes in a timely manner.

In the United States, many pulmonologists and cardiologists care for patients with PH, but there are only few dedicated fellowships in this space. We believe in the importance of creating structured curriculums and teach the practicing physicians about the nuances and complexities of PH.

Author Contributions: Conceptualization, E.O., A.J. and A.V.; writing—original draft preparation, E.O.; writing—review and editing, E.O. and A.V. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

List of Contributions:

1. Labrada, L.; Romero, C.; Sadek, A.; Belardo, D.; Raza, Y.; Forfia, P. Intravenous Diuresis in Severe Precapillary Pulmonary-Hypertension-Related Right Heart Failure: Effects on Renal Function and Blood Pressure. *J. Clin. Med.* **2023**, *12*, 7149.
2. Aetou, M.; Wahab, L.; Dreher, M.; Daher, A. Significance of Hypocapnia in the Risk Assessment of Patients with Pulmonary Hypertension. *J. Clin. Med.* **2023**, *12*, 6307.
3. Cinar, C.; Yildizeli, S.O.; Balcan, B.; Yildizeli, B.; Mutlu, B.; Peker, Y. Determinants of Severe Nocturnal Hypoxemia in Adults with Chronic Thromboembolic Pulmonary Hypertension and Sleep-Related Breathing Disorders. *J. Clin. Med.* **2023**, *12*, 4639.
4. Oliveros, E.; Mauri, M.; Pietrowicz, R.; Sadek, A.; Lakhter, V.; Bashir, R.; Auger, W.R.; Vaidya, A.; Forfia, P.R. Invasive Cardiopulmonary Exercise Testing in Chronic Thromboembolic Pulmonary Disease; Obesity and the V(E)/VCO(2) Relationship. *J. Clin. Med.* **2024**, *13*, 7702.
5. Anand, S.; Cronin, E.M. Arrhythmias in Patients with Pulmonary Hypertension and Right Ventricular Failure: Importance of Rhythm Control Strategies. *J. Clin. Med.* **2024**, *13*, 1866.
6. Vaidy, A.; Vahdatpour, C.A.; Mazurek, J. Exercise Testing in Patients with Pulmonary Hypertension. *J. Clin. Med.* **2024**, *13*, 795.
7. Contreras, J.; Nussbaum, J.; Cangialosi, P.; Thapi, S.; Radakrishnan, A.; Hall, J.; Ramesh, P.; Trivieri, M.G.; Sandoval, A.F. Pulmonary Hypertension in Underrepresented Minorities: A Narrative Review. *J. Clin. Med.* **2024**, *13*, 285.
8. Riley, J.M.; Fradin, J.J.; Russ, D.H.; Warner, E.D.; Brailovsky, Y.; Rajapreyar, I. Post-Capillary Pulmonary Hypertension: Clinical Review. *J. Clin. Med.* **2024**, *13*, 625.
9. Anand, S.; Sadek, A.; Vaidya, A.; Oliveros, E. Diagnostic Evaluation of Pulmonary Hypertension: A Comprehensive Approach for Primary Care Physicians. *J. Clin. Med.* **2023**, *12*, 7309.

Reference

1. Humbert, M.; Kovacs, G.; Hoeper, M.M.; Badagliacca, R.; Berger, R.M.F.; Brida, M.; Carlsen, J.; Coats, A.J.S.; Escribano-Subias, P.; Ferrari, P.; et al. 2022 ESC/ERS Guidelines for the diagnosis and treatment of pulmonary hypertension. *Eur. Heart J.* **2022**, *43*, 3618–3731. [[PubMed](#)]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.