# Transmission Electron Microscopy in Primary Ciliary Dyskinesia Diagnosis: 2025 ERS/ATS Guidelines for Clinical Electron Microscopists

E.P. Wartchow[1]

[1] Children's Hospital Colorado.

## Abstract

The 2025 European Respiratory Society and American Thoracic Society joint guidelines provide the first unified, evidence-based recommendations for diagnosing primary ciliary dyskinesia (PCD), fundamentally reshaping the role of transmission electron microscopy (TEM) in clinical practice. The guidelines explicitly state that no single test, including TEM, can exclude PCD, emphasizing a multimodal diagnostic approach at specialized centers. This presentation equips electron microscopists with practical knowledge for TEM imaging, standardized reporting, and avoidance of common pitfalls. Understanding both the strengths and limitations of ultrastructural analysis is essential for accurate PCD diagnosis and optimal patient care in the modern genomic era.

Key insights include:

· The BEAT PCD classification system distinguishes Class 1 (diagnostic) from Class 2 defects (supportive)

· Technical quality standards

· Distinguishing primary structural defects from secondary ciliary dyskinesia

· Integration with genetic testing and cilia function tests.

## References

1. Shoemark A, et al. International consensus guideline for reporting transmission electron microscopy results in the diagnosis of primary ciliary dyskinesia (BEAT PCD TEM Criteria). Eur Respir J. 2020; 55(4):1900725.
2. Shoemark A, et al. European Respiratory Society and American Thoracic Society guidelines for the diagnosis of primary ciliary dyskinesia. Eur Respir J. 2025;66(6):2500745. doi:10.1183/13993003.00745-2025