



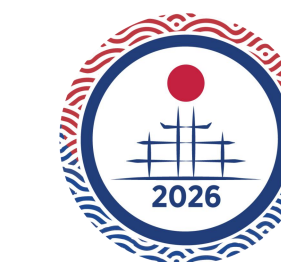
P2.959: Diagnostic Performance and Safety Profile of Shape-sensing Robotic-assisted Bronchoscopy in Peripheral Pulmonary Lesions: A Systematic Review and Meta-Analysis

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INTRODUCTION

ssRAB is an emerging modality for diagnosing peripheral pulmonary lesions, with enhanced stability, precise maneuverability, and improved peripheral access.

Gap: Most existing literatures are single-center, small-sample, and retrospective experience, and the definitional discrepancy limits cross-study comparisons.

Objective: to evaluate the diagnostic performance and safety profile to provide largest and most up-to-date evidence for clincial decision-making.

METHODS

PubMed, Embase, and Cochrane Library were searched from inception to December 2025. Study quality was assessed using the Quality Assessment of Diagnostic Accuracy Studies-3. Random-effects model was used to estimate the pooled diagnostic yield, sensitivity for malignancy, and complication, with rates (%) and 95% confidence intervals (CI) when the I² index exceeded 50%. Cumulative meta-analysis was performed to assess the temporal stability and evidence saturation of the pooled diagnostic yield. Publication bias was evaluated using funnel plots and Egger's test.

DISCUSSION AND CONCLUSION

Actionable Take Away Message

- ssRAB was associated with favorable, definition-dependent diagnostic yield (82.5%-88.1%) with exceptional safety
- ATS/ACCP strict definition recommended for reliable cross-study comparisons
- Performance reflects entire procedural set-up, not just the robotic platform.

Future Direction for Research

- Head-to-head RCTs comparing ssRAB with other modalities or platforms and patient-level data are warranted
- Evaluate real-world cost-effectiveness and validate findings in low-volume centers.
- Assess specimen adequacy for comprehensive molecular profiling to support precision oncology.

REFERENCES & ACKNOWLEDGEMENTS

Reference

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Acknowledgements

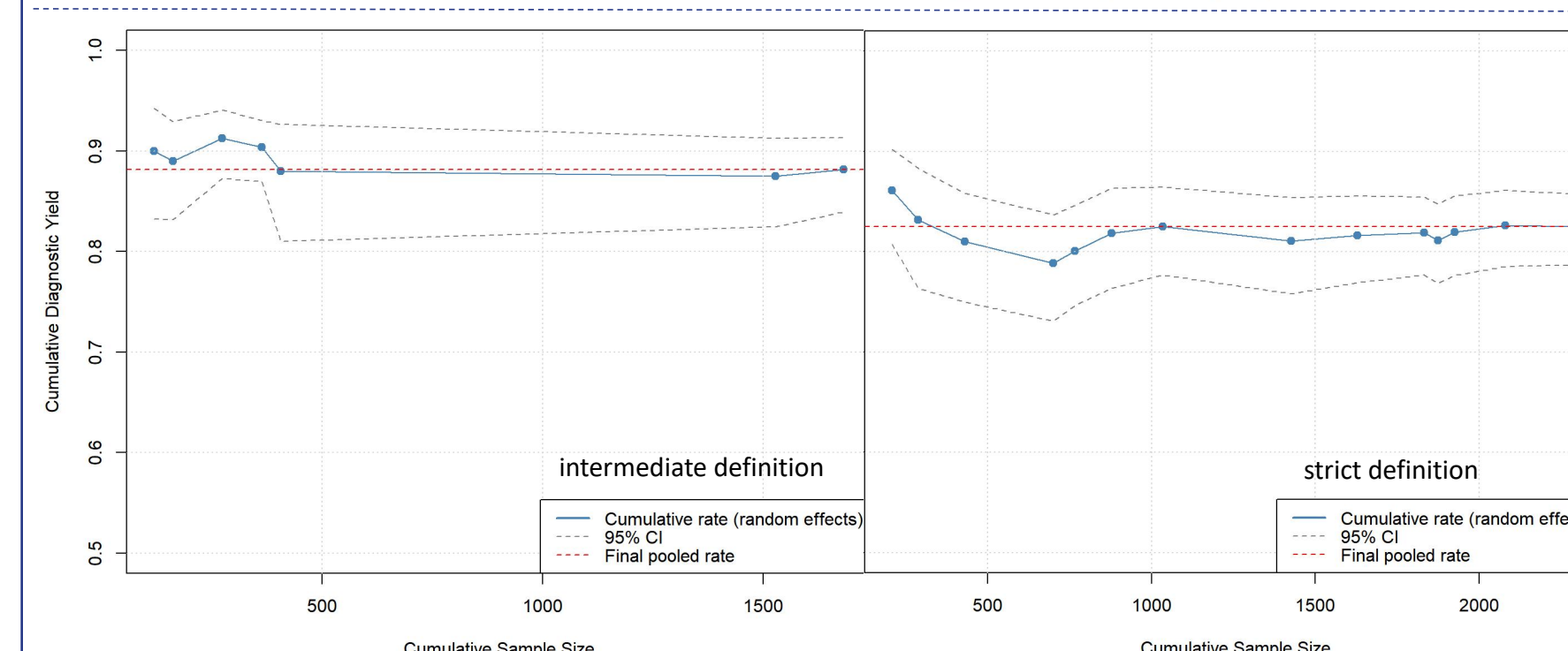
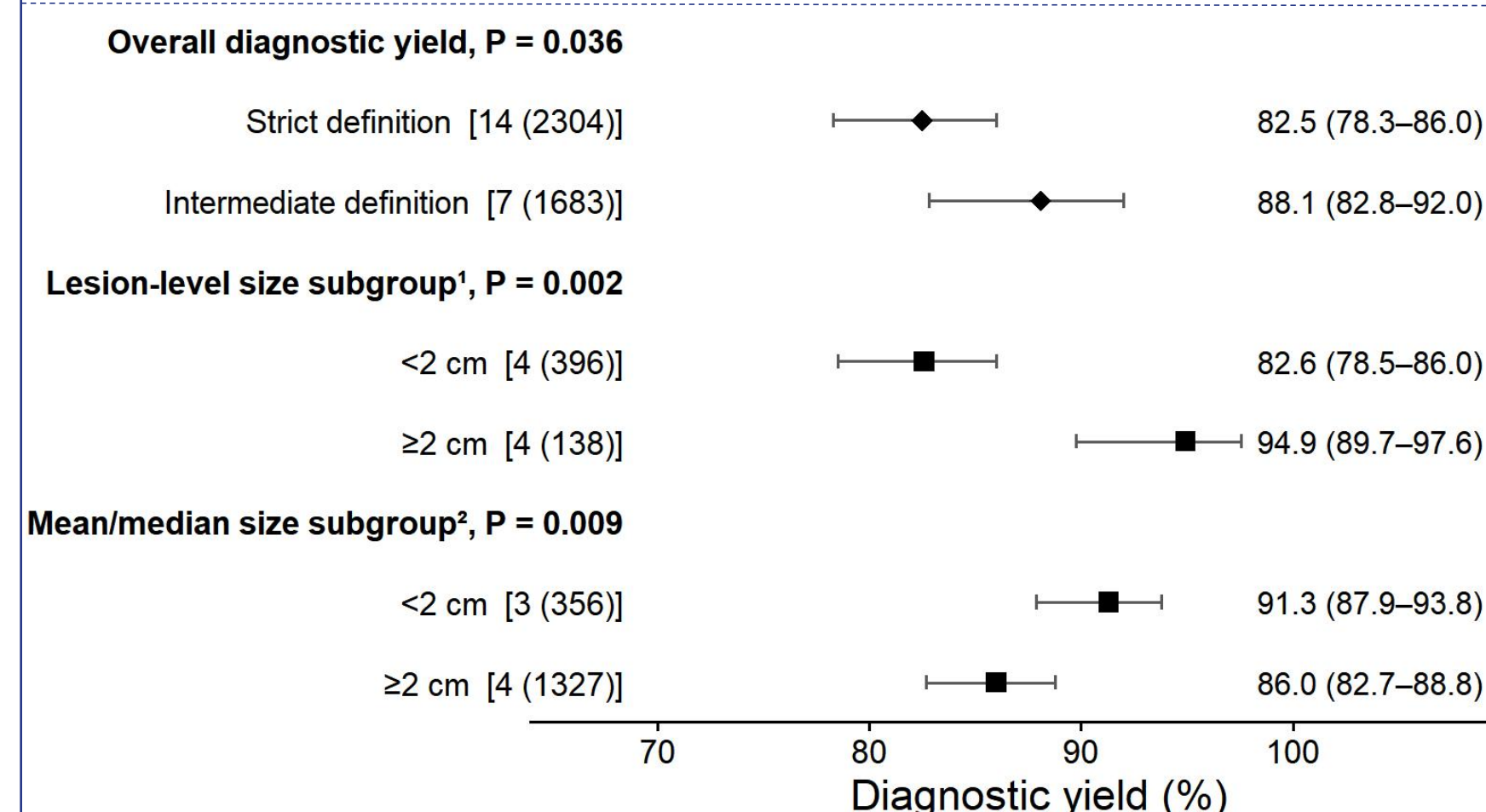
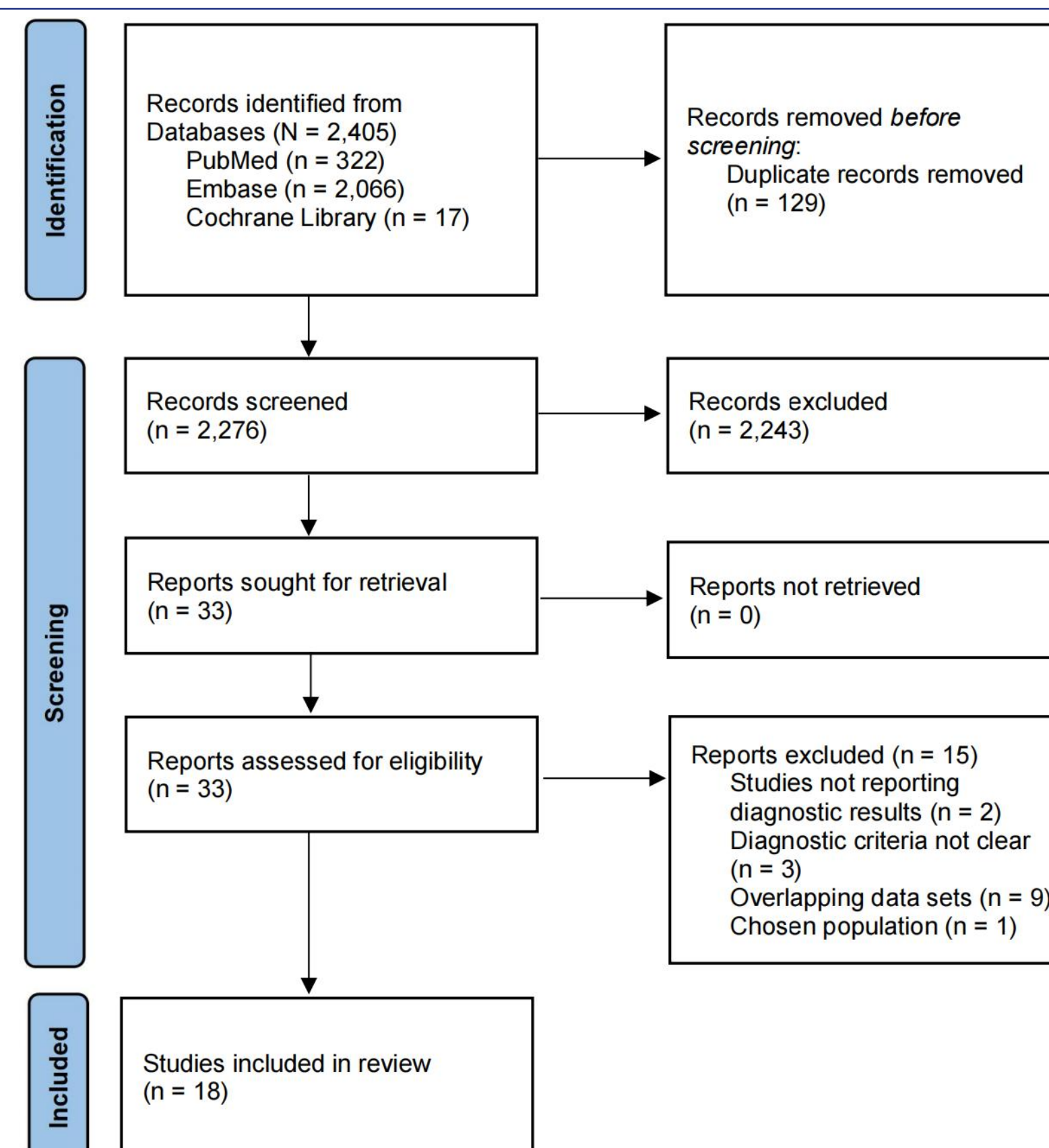
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Artificial Intelligence (AI) Use Disclaimer

ChatGPT plus was used for language polishing.



RESULTS



Study Selection

- A total of **3678 lesions** from 18 studies were included.

Diagnostic Performance

- Pooled diagnostic yield**

-strict definition

82.5% (95% CI: 78.3%-86.0%)

-intermediate definition

88.1% (95% CI: 82.8%-92.0%)

- Cumulative meta-analysis**

stabilized after approximately 1,500 lesions for the strict definition and 500 lesions for intermediate definition

- Subgroup analysis**

consistent performance across study designs, region, and nodule characteristics. Diagnostic yield was significantly influenced by outcome definition, publication year, and lesion size (P<0.05)

Safety Profile

- Pooled complication rates**

-pneumothorax

1.8% (95% CI:1.3%-2.3%)

-chest tube placement

1.1% (95% CI: 0.7%-1.5%)

-severe bleeding

0.0% (95% CI: 0.0%-0.3%)