

Dr. Pooya Eini, MD

Physician-Researcher | Cardiac Imaging & Clinical Artificial Intelligence

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PROFILE

Physician-researcher with a focused research profile in cardiovascular medicine, cardiac imaging, and clinical artificial intelligence. My work centers on machine learning–based diagnostic and prognostic models, particularly in echocardiography, ultrasound-based cardiovascular assessment, multimodal clinical prediction, and risk stratification. I have extensive experience in systematic reviews, meta-analyses, study design, scientific writing, and evaluation of AI models for clinically meaningful cardiovascular outcomes.

RESEARCH FOCUS

- Cardiac imaging artificial intelligence, including echocardiography, ultrasound, cardiac CT, and CMR.
- Risk prediction modeling for heart failure, stroke, cardiometabolic disease, valvular heart disease, and post-procedural outcomes.
- Machine learning model evaluation, diagnostic/prognostic performance synthesis, calibration, validation, and clinical utility.
- Evidence synthesis and meta-analysis of AI-based diagnostic and prognostic models in cardiovascular medicine.

EDUCATION

Doctor of Medicine (MD) | Shahid Beheshti University of Medical Sciences, Tehran, Iran | 2017–2024

RESEARCH EXPERIENCE

Research Assistant | Shaheed Rajaie Cardiovascular Medical and Research Center, Tehran, Iran | 2025–present

Research Assistant | Toxicological Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran | 2023–present

Research Assistant | Immunology and Cancer Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran | 2023–present

CORE RESEARCH SKILLS

- Systematic review and meta-analysis, including diagnostic test accuracy and prediction model performance synthesis.
- Clinical prediction modeling concepts: discrimination, calibration, validation, and model comparison.
- Scientific literature searching, protocol development, data extraction, evidence appraisal, and manuscript preparation.
- Cardiovascular imaging research with emphasis on echocardiography/ultrasound and AI applications.
- Statistical analysis and reproducible research workflows using R; familiarity with machine learning evaluation frameworks.

SELECTED FIRST-AUTHOR PUBLICATIONS

1. Eini P, Rezayee M, Tremblay J. Automated assessment of right heart function by artificial intelligence: A systematic review and meta-analysis. *European Journal of Radiology Open* 2026;16:100713.
2. Eini P, Rezayee M, Kassulke M. Machine Learning and Regression–Based models for Prediction of Postoperative Atrial Fibrillation Following Coronary Artery Bypass Grafting: A Systematic Review and Meta-Analysis. *International Journal of Cardiology Cardiovascular Risk and Prevention* 2026:200619.
3. Eini P, Mahdavi M, Ghaemmaghani Z, Pouraliakbar H, Houshmand G. Heart failure in a 10-year-old girl: incidental discovery of adrenal adenoma by cardiac MRI—case report. *European Heart Journal-Case Reports* 2026;10(3):ytag110.
4. Eini P, Houshmand G, Rezayee M, Kassulke M. Accuracy of machine learning models for mitral regurgitation severity assessment: A systematic review and meta-analysis. *International Journal of Cardiology Cardiovascular Risk and Prevention* 2026:200642.
5. Eini P, Eini P, Serpoush H, Rezayee M, Tremblay J. Accuracy of machine learning models in predicting recurrent venous thromboembolism: a systematic review and meta-analysis. *Journal of Thrombosis and Thrombolysis* 2026:1–16.
6. Eini P, Eini P, Rezayee M, Tremblay J. MicroRNA Expression Profiles in Abdominal Aortic Aneurysms: A Systematic Review of Potential Diagnostic and Prognostic Biomarkers. *International Journal of Cardiology Cardiovascular Risk and Prevention* 2026:200651.

7. Eini P, Rezayee M, Kassulke M, Tremblay J. Efficacy and comparative performance of machine learning models for stroke risk prediction in hypertensive patients: A systematic review and meta-analysis. *International Journal of Cardiology Cardiovascular Risk and Prevention* 2025;200564.
8. Eini P, Eini P, Serpoush H, Rezayee M, Tremblay J. Machine learning-based classification of carotid plaques via ultrasound: a systematic review and meta-analysis of diagnostic performance. *International Journal of Emergency Medicine* 2025;18(1):247.
9. Eini P, Eini P, Serpoush H, Rezayee M, Tremblay J. Machine Learning Applications in the Diagnosis and Prediction of Aortic Dissection: A Systematic Review and Meta-Analysis. *Journal of Cardiac Surgery* 2025;2025(1):3328006.
10. Eini P, Eini P, Serpoush H, Rezayee M, Tremblay J. Advancing Mortality Prediction in Pulmonary Embolism Using Machine Learning Algorithms—Systematic Review and Meta-Analysis. *Pulmonary Circulation* 2025;15(3):e70166.
11. Eini P, Eini P, Serpoush H, Rezayee M. Diagnostic Performance of Machine Learning Algorithms for Predicting Heart Failure in Diabetic Patients: A Systematic Review and Meta-Analysis. *Endocrinology, Diabetes & Metabolism* 2025;8(5):e70111.
12. Eini P, Eini P, Rezayee M, Tremblay J. Machine learning models for carotid artery plaque detection: a systematic review of ultrasound-based diagnostic performance. *Journal of Stroke and Cerebrovascular Diseases* 2025:108446.

Complete publication records: full list available via Google Scholar or upon request.

SELECTED MANUSCRIPTS UNDER REVIEW

- CT Mitral Valve Calcium Score and Immediate Outcomes After Percutaneous Transvenous Mitral Commissurotomy.
- Left Main Coronary Artery Stenosis Assessment on Coronary CT Angiography.
- Artificial Intelligence–Based Detection of Coronary Atherosclerotic Plaque Using Intravascular Ultrasound Imaging: A Systematic Review and Meta-analysis.
- Diagnostic Accuracy of AI-Based Models for Pulmonary Edema: A Systematic Review and Meta-analysis.

SELECTED TRAINING

- Linear Regression in R for Public Health – Imperial College London
- Introduction to Statistics and Data Analysis in Public Health – Imperial College London
- Computing for Cancer Informatics – Johns Hopkins University
- Cancer Biology – Johns Hopkins University
- Introduction to Breast Cancer – Yale University
- Immunology: The Immune System and Its Failures – Imperial College London