NANOX AI

RABIN MEDICAL CENTER
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TEL AVIV UNIVERSITY

Opportunistic Screening of Coronary Artery Calcification on Non-gated Conventional CT Scans
Using Artificial Intelligence Integration

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Introduction

- Recent advancements in artificial intelligence (AI) led to the development of automatic Coronary artery calcification (CAC) analysis based on chest CT scans.
- The objective of this study is to assess the impact of AI-based CAC evaluation on improving the allocation of add-on therapies and further evaluation.

Methods

- We used a novel propriety AI software **to estimate CAC** from non-gated, non-contrast chest CT scans. Patients were categorized into groups: **low** CAC 0-99 Agatston unit (AU), **moderate** CAC 100-399AU, and **high** CAC ≥ 400 AU (Figure 1).
- **Exclusion criteria included** age > 75 years, prior myocardial infarction, percutaneous coronary intervention (PCI), coronary artery bypass graft (CABG), life expectancy < 2 years, and lack of access to medical records.
- Patients classified as **high CAC** were invited to a dedicated clinic to perform a risk factor and clinical assessment, initiate appropriate medication, and refer to further testing as needed.
- For **low-moderate CAC**, referring physicians were informed of CAC status, encouraging preventive management.

Results

- **996** eligible patients between January 1th, 2023 to February 29th, 2024 were evaluated for inclusion. **302/996 (30%)** were excluded: **196** due to lack of access to medical records and **106** for medical reasons.
- Out of **694** enrolled patients, **53 (7.6%)** patients were classified as high CAC, **184 (26.5%)** as moderate, and **457 (65.9%)** as low CAC (Figure 2). At the dedicated clinic for high CAC patients, Statin prescriptions were verified for all patients.
- **Fourteen** patients were referred to myocardial perfusion imaging, of which **4** were referred for invasive coronary angiography: one underwent PCI (Figure 3, case I), one referred to CABG (Figure 3, Case II), the third was diagnosed with a chronic total occlusion of the Posterolateral branch and did not undergo PCI, and the last refused to undergo angiography.

Conclusions

- This ongoing study indicates routine CAC quantification using AI software on chest CT scans can identify patients who may benefit from preventive cardiology services. Further follow-up is required to assess its clinical impact.
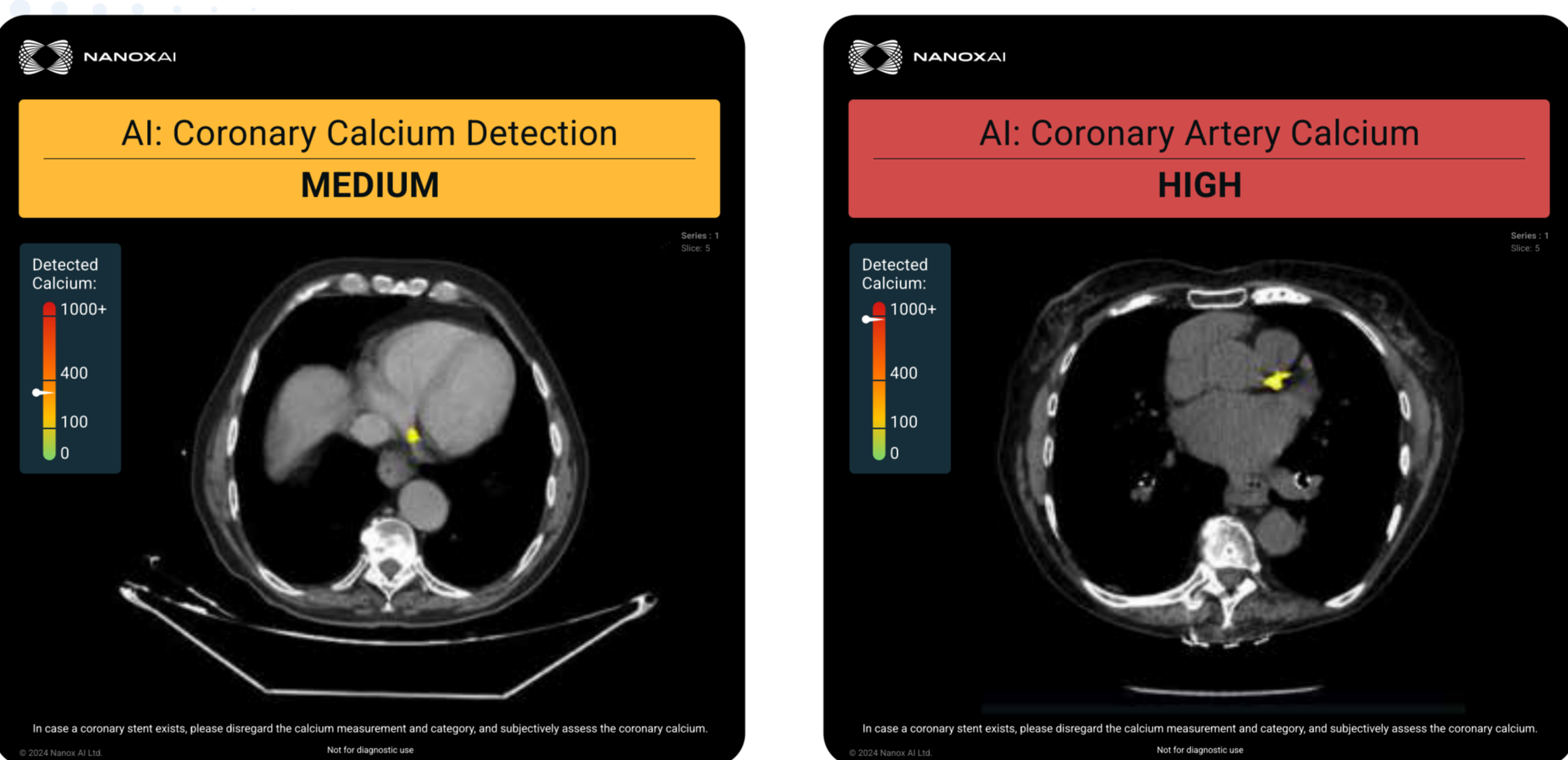
Figure 1
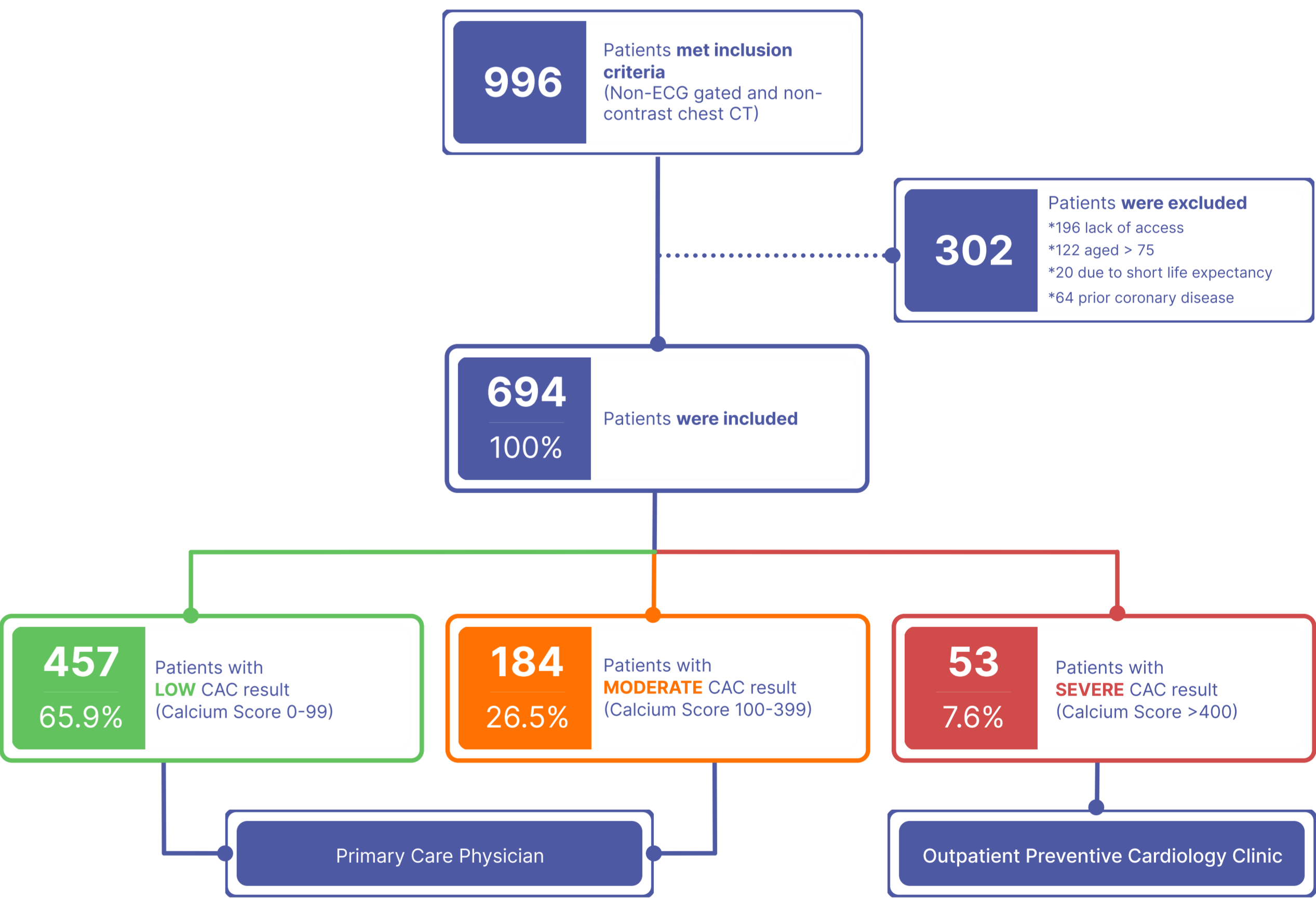Software stratification calcium burden
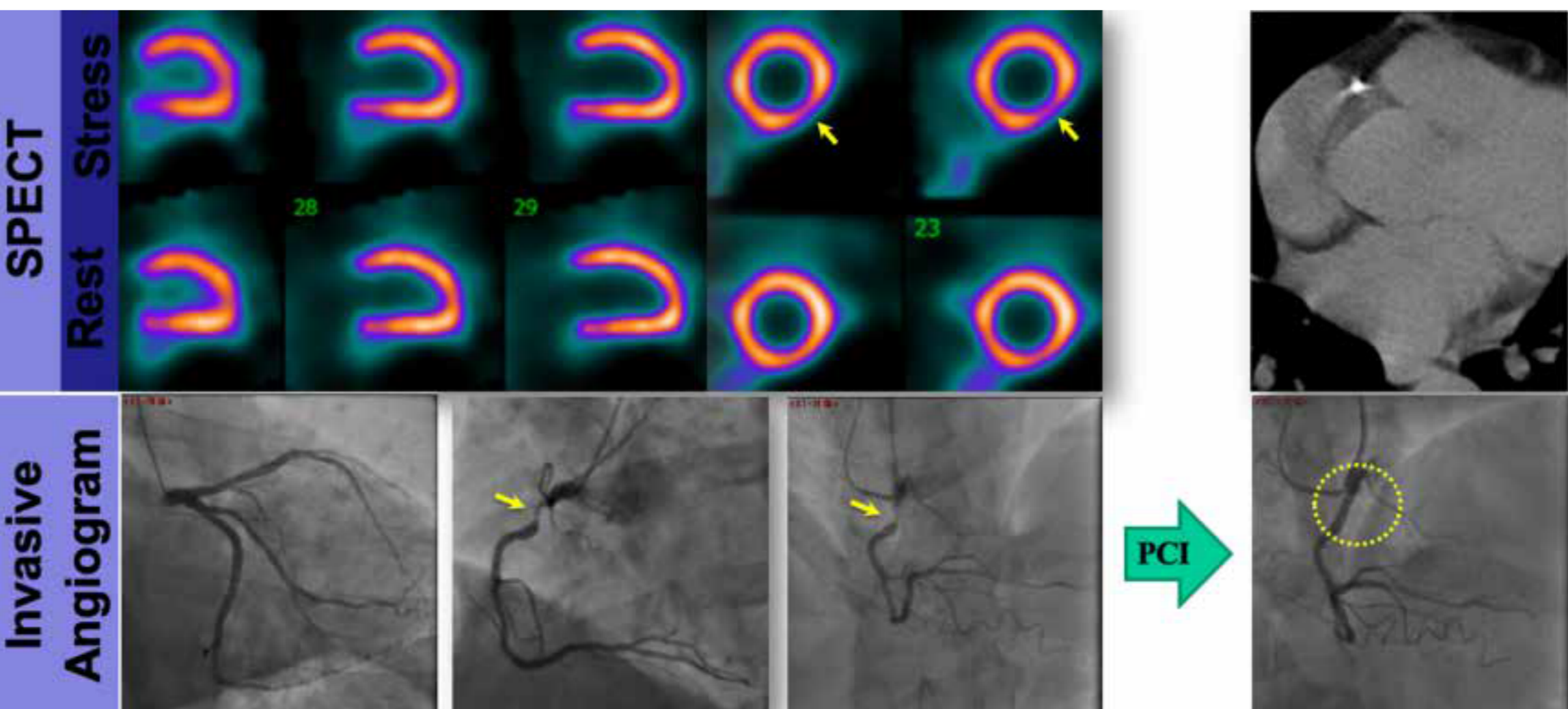

Figure 2
Patient Flowchart

Figure 3
Case I

Figure 3
Case II