ABSTRACT BOOK

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ORAL SESSION

Technologies in Medicine Oral Session

12 abstracts

DATE AND TIME

24th of April, 2026 • 16:00

JURY

> **prof. dr hab. Grzegorz Tatoń**
>
> **dr hab. inż. Klaudia Proniewska-van Dam, prof. UJ**
>
> **dr Piotr Walecki**
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> **dr Tomasz Rok**
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> **dr n. med. Justyna Hajto-Bryk**

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CardioAtlas: Evidence-Grounded Multimodal AI for Cardiology Workflows

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Introduction

CardioAtlas is an explainable, multimodal, agentic AI co-pilot for cardiologists who must rapidly synthesize longitudinal EHR data (symptoms, vitals, labs, medications, comorbidities) with heterogeneous cardiac imaging (CT/MRI DICOM series, echocardiography stills and cine loops, and "scrolling" 3D stacks). Because these inputs are fragmented across systems and time, clinicians face high cognitive load, heavier documentation, and increased risk of missed context. Single-model assistants can summarize text but often underperform on multimodal workflows, source-grounded clinical statements, and calibrated uncertainty

Aim of the study

To develop and demonstrate a clinician-facing cardiology co-pilot that integrates patient context and multimodal imaging for structured reasoning and documentation, while generating patient education only from clinician-approved facts and retrieved sources.

Materials and methods

CardioAtlas uses a policy-constrained orchestration layer that treats models as tools and routes tasks through an activation pathway to specialized experts. The pipeline ingests EHR text and cardiac imaging, normalizes inputs into evidence packets (metadata plus representative frames/slices/clips and any available report text), and invokes dedicated vision and text experts for modality-specific interpretation. Guideline and reference claims are grounded via retrieval from a local knowledge library under a cite-or-refuse rule, withholding unsupported assertions. Calculator tools run only when required inputs are present, and schema constraints block medication dosing unless minimum clinical fields (e.g., renal function, age, weight, contraindications) are available. Outputs include explicit uncertainty, supporting evidence, and missing-data checklists, with the option to surface expert disagreement. Clinician signoff is required for any content intended for clinical use. Patient education is produced through a separate pathway limited to clinician-confirmed facts and retrieved references.

Results

We report a working prototype and planned retrospective evaluation assessing documentation completeness, citation coverage for guideline claims, clinician-rated usefulness, time-to-note reduction, and concordance of generated differentials/plans with expert review.

Conclusions

A policy-constrained, agentic multi-model architecture can better fit cardiology's multimodal workflow than a single LLM while improving trust through evidence grounding, uncertainty reporting, missing-data gating, and mandatory clinician oversight, enabling practical deployment while limiting unsupported

inferences and separating clinical documentation from constrained patient education.