

FROM BLACK BOX TO BEDSIDE: EXPLAINABLE AI FOR REDUCING COGNITIVE LOAD AND IMPROVING REVENUE PERFORMANCE IN URGENT CARE.

A Prospective Controlled Study of an AI-Native, Closed-Loop Revenue Cycle System

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Background

- High-throughput urgent care environments create competing demands:
 - Clinical care
 - SOAP notes
 - Coding (ICD-10, CPT, E/M)
 - Billing and compliance
- Leads to:
 - High cognitive load
 - Documentation inefficiencies
 - Coding variability
 - Revenue leakage
- Existing AI limitations:
 - Black-box outputs
 - Low transparency
 - Poor clinician trust
 - Weak workflow integration

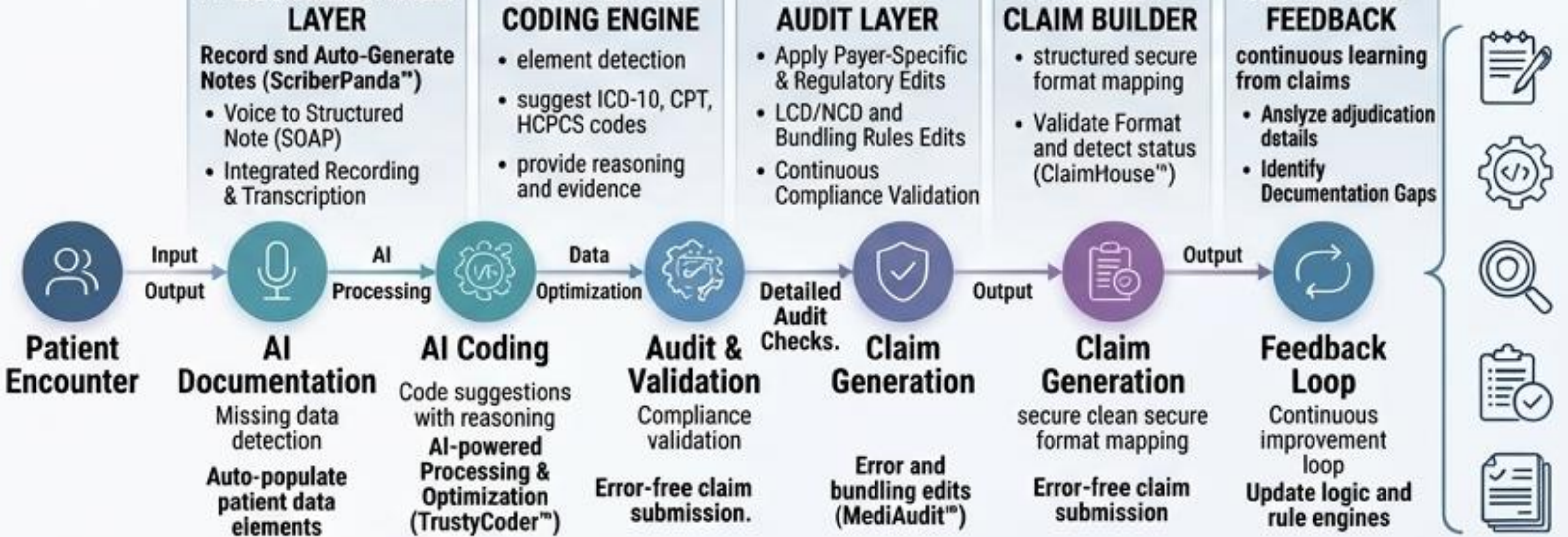
Objective

- Evaluate whether Medicaddie TrustOS (AI-native, explainable RCM system) can:
 - Reduce cognitive load
 - Reduce documentation time
 - Improve coding accuracy
 - Increase reimbursement per encounter
 - Reduce denials and rework
 - Improve clinician trust and adoption

Methods

- Prospective, multi-site controlled study (12 weeks)
- 5 urgent care clinics
- 40+ clinicians (MD, DO, NP, PP)
- Study Arms:
 - Control: Standard EHR workflows
 - Intervention: Medicaddie TrustOS system including:
 - AI Documentation Layer
 - Explainable Coding Engine
 - Real-Time Audit Layer
 - Intelligent Claim Engine
- System Properties:
 - Explainable AI (neurosymbolic)
 - Human-in-the-loop validation
 - Closed-loop feedback system
 - Continuous learning from claims

Workflow



Results

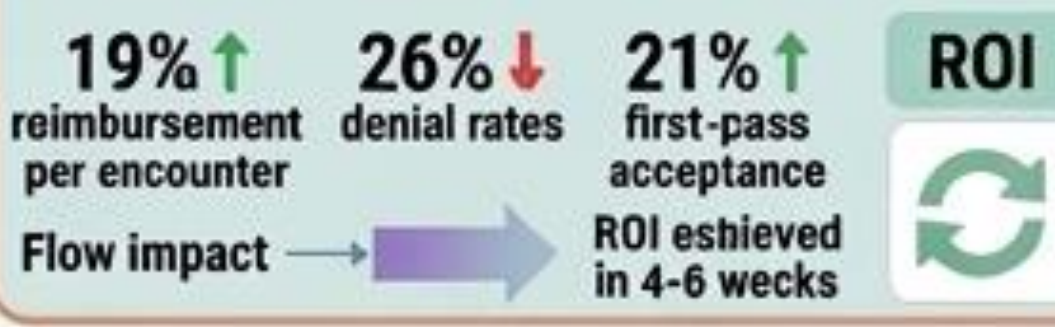
Cognitive Load & Efficiency



Coding & Documentation Quality



Financial Impact



Operational Performance



Discussion

- Black-box AI fails in clinical workflows
- Explainability enables:
 - trust
 - validation, safe decision-making
- Human + AI collaboration is essential

System-Level Insight

- AI-native architecture (not retrofitted)
- End-to-end workflow integration
- Closed-loop revenue intelligence
- Real-time error prevention

Strategic Takeaway

- Reducing cognitive load directly improves:
- clinician efficiency
 - documentation quality
 - financial outcomes

Explainability—not automation—is the primary driver of clinician adoption and sustained impact.

