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# Ambient Artificial Intelligence Versus Human Scribes in the Emergency Department

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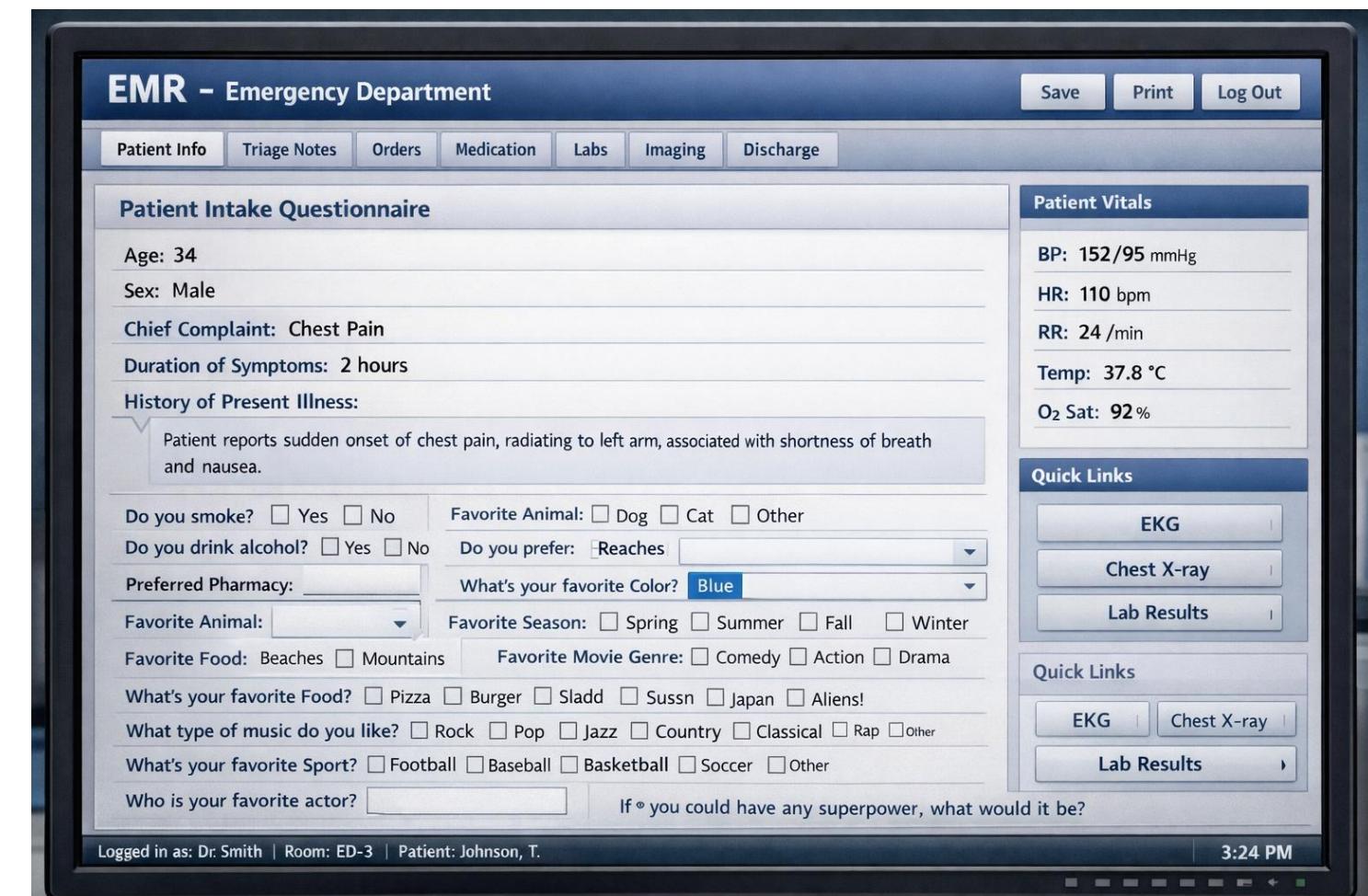
# Introduction

## Background

Medical documentation have been in increasing and this creates significant challenges for physicians. Human medical scribes have emerged as one solution, reducing the documentation burden by transcribing patient encounters in real-time. However, scribe programs require substantial investment, extensive training infrastructure, and ongoing management resources.

## Objective

The goal of this study was to assess if ambient AI technology match the documentation quality of human scribes.



The screenshot shows a computer screen displaying an EMR (Electronic Medical Record) system for the Emergency Department. The main window is titled "EMR - Emergency Department" and contains a "Patient Intake Questionnaire". The questionnaire includes fields for Age (34), Sex (Male), Chief Complaint (Chest Pain), Duration of Symptoms (2 hours), and History of Present Illness (Patient reports sudden onset of chest pain, radiating to left arm, associated with shortness of breath and nausea). Below these, there are several dropdown menus and checkboxes for hobbies and preferences. On the right side of the screen, there is a "Patient Vitals" section showing BP: 152/95 mmHg, HR: 110 bpm, RR: 24 /min, Temp: 37.8 °C, and O<sub>2</sub> Sat: 92%. There are also "Quick Links" for EKG, Chest X-ray, and Lab Results. The bottom of the screen shows the user is logged in as Dr. Smith, in Room ED-3, for Patient Johnson, T, and the time is 3:24 PM.

# Study Design & Evaluation Framework

01

## Study Type

Prospective, observational, single-blind trial

02

## Primary Outcome

Note quality assessed using the Physician Documentation Quality Instrument (PDQI-9) by two blinded reviewers

## PDQI-9 Assessment Criteria

- **Up-to-date:** Current medical information
- **Accurate:** Error-free and true
- **Thorough:** Includes relevant details
- **Useful:** Aids decision-making
- **Organized:** Logical structure
- **Comprehensible:** Clear and understood
- **Succinct:** Concise, no excess
- **Synthesized:** Integrated narrative
- **Internally Consistent:** No contradictions

# Results



## Total Encounters

Patient visits analyzed across adult and pediatric populations

## Human Scribed

123 adult + 161 pediatric encounters

426

## AI Scribed

271 adult + 155 pediatric encounters

## Primary Outcome: PDQI-9 Quality Scores by Population

### Adult Patients

AI Score: 38.22

Human Score: 40.59

Adjusted Rate Ratio: -2.37 (95% CI -5.43 to 0.70)

No statistically significant difference — AI performed comparably to human scribes in adult emergency encounters.

### Pediatric Patients

AI Score: 40.36

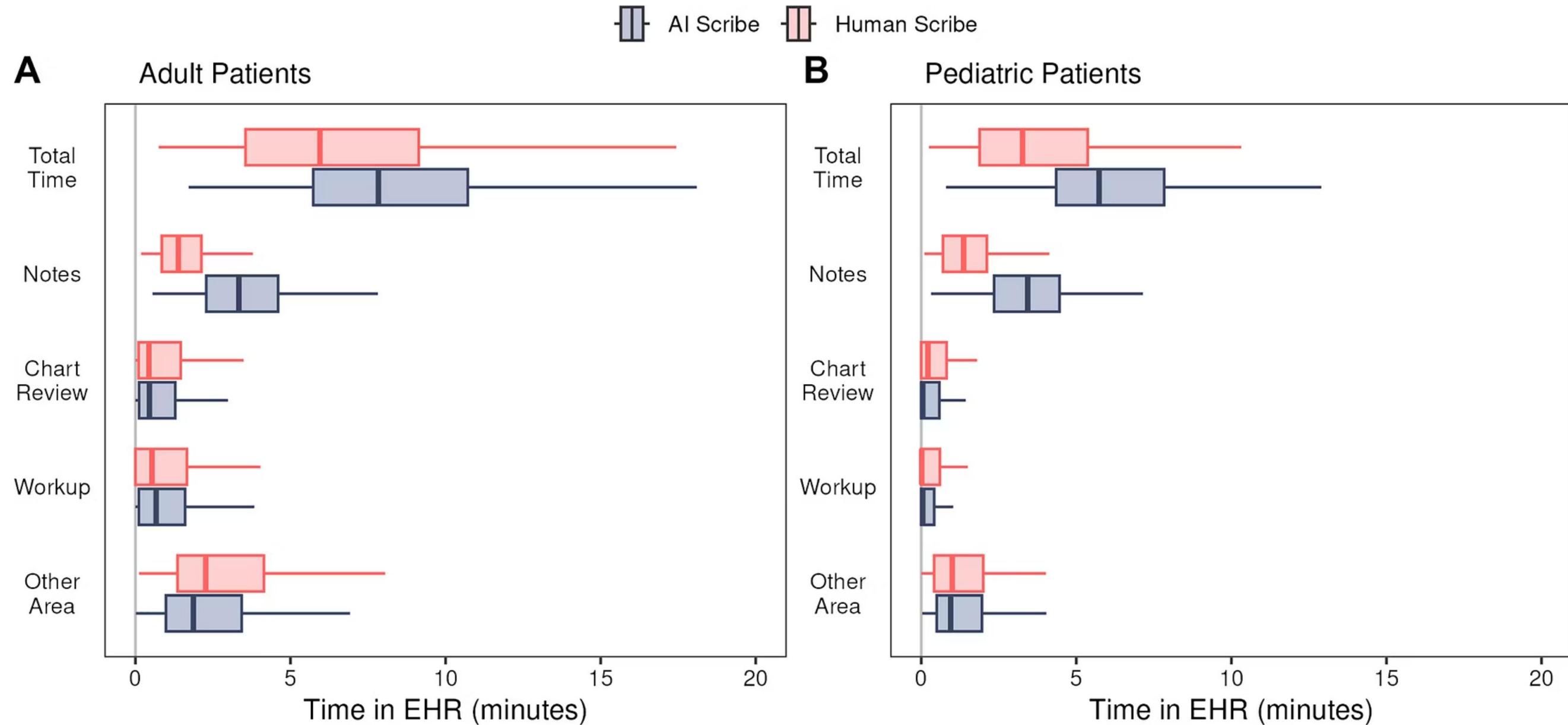
Human Score: 42.25

Adjusted Rate Ratio: -1.89 (95% CI -3.58 to -0.20)

Statistically significant difference — AI documentation quality was lower in pediatric encounters, suggesting room for improvement.

# Secondary outcome

## Time spent in electronic medical record



# Conclusions

"Conclusion: In comparison to human scribes, AI scribes were associated with more time spent in the electronic health record notes section, more physician note contribution, and similar to lower quality notes."

## Thoughts

### Cost Analysis Missing

The study didn't evaluate economic factors.

### Learning Curve Effect

Physician proficiency with ambient AI tools will improve over time.

### Rapid Technology Evolution

Ambient AI systems are improving rapidly through machine learning.