

Clinical Mind AI: Improving Clinical Reasoning Using Generative AI

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Introduction

- **Importance of Clinical Reasoning:** Essential skill for diagnosing based on patient history, physical examination, and medical tests (1-5).
- **Challenges in Teaching and Learning:** Traditional methods provide pre-summarized patient histories, unlike real-life doctor-patient interactions (1,7,8). OSCEs, introduced in 1975, they use actors for patient interaction simulations but are costly and hard to standardize (9-12).
- **Limitations of Current Solutions:** Virtual patients address cost and scalability but are confined to specific cases and lack adaptability (13-16).



The idea: Clinical Mind AI

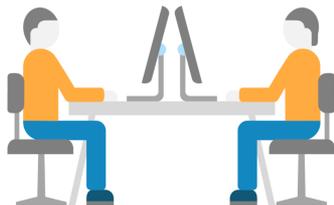
We can use generative AI to act as a patient to improve clinical reasoning through deliberate practice, with the added benefit of adapting the scenarios to fit specific local contexts and learning outcomes.



Two users

Medical Teacher

Provides illness script to the platform. The app acts as the patient of the clinical case.



Medical Student

Interacts with the simulated patient and decides the working diagnosis. Receives feedback about the interaction and problem-solving skills.

Feedback: Problem-solving framework

The **main differences** in problem-solving practices between expert physicians and medical students are:

Differential Diagnosis Formulation	Diagnostic Plan and Execution
Clinical Data Reassessment	Clinical Solution Review

The feedback provided to medical students not only assesses the **accuracy of their diagnoses** but also **focuses on specific problem-solving skills**.

Authenticity: the role of immersive technologies and voice recognition

- The interaction is through voice and immersive technologies to create **realistic experiences**.
- Augmented reality is ideal for clinical simulations as it blends interactive digital elements **with the real-world environment**.



For Reference Only: Intended Final Product

Prototype: Clinical Mind AI

Teacher's view

CLASS NAME	TIME PERIOD	STUDENTS	# CASES	ACTION
Internal Medicine I	Fall 2024	7	2	View details
Internal medicine II	Fall 2023	4	3	View details
Surgery	Fall 2023	2	3	View details

Student's view

MEDICAL FIELD	PATIENT	ACTION
Medical Field	Sierra Matthews, 22	Run Simulation
Medical Field	Richard Sullivan, 28	Run Simulation

Early results

- ChatGPT exhibited authentic performance in **acting as a patient** and in **giving feedback** about the diagnosis.
- The app has already been tested with 5 doctors to **improve the prompt and authenticity of the responses**.
- The model **keeps the role of the patient**, responding to **up to 40 questions**.

References

