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Agentic Ai In Healthcare: A Review Of Goal-Oriented Healthcare Assistants With Symptom Guidance, Medication Adherence And Safe Escalation

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Abstract—Healthcare systems increasingly use artificial intelligence to improve patient support, reduce manual effort and assist decision-making. Agentic AI differs from systems that only answer queries: an agent pursues goals, plans multi-step actions, uses tools such as databases and reminders and coordinates several functions to help a user manage health over time. This paper reviews agentic AI for consumer healthcare assistance. It examines the components of large-language-model agents, namely planning, tool use, memory and reflection, and the use of retrieval-augmented generation to ground answers in trusted medical sources. It reviews evidence on the clinical knowledge of large language models, their limitations including hallucination, studies of the accuracy and safety of symptom checkers, conversational diagnostic systems, and interventions that improve medication adherence. A reference architecture for a healthcare assistant is proposed with five layers: user and authentication, agent core with planning and memory, tool layer providing symptom guidance, medicine reminders, report storage and emergency information, a safety and escalation layer enforcing scope limits and red-flag detection, and an interface layer. Research gaps, objectives, a comparison of assistant capabilities and challenges such as accuracy, liability, privacy and digital literacy are discussed. The review emphasizes that such assistants must provide preliminary information only and direct users to qualified professionals.
Index Terms—Agentic AI, healthcare assistant, large language models, retrieval-augmented generation, symptom checker, medication adherence, safety escalation, patient engagement

I. INTRODUCTION

Many people search the internet when they feel unwell, and the results are often inconsistent or alarming. Others forget doses of prescribed medicine or lose track of their test reports. A digital assistant that remembers a user's medicines, stores their reports, answers general health questions and knows when to tell them to see a doctor could help with these everyday problems.

Recent large language models show strong performance on medical question answering. Singhal *et al.* [1] demonstrated that models tuned with clinical instructions approach expert-level answers on medical examination questions, and Thirunavukarasu *et al.* [2] reviewed their potential and risks in medicine. Agentic systems extend such models with planning, memory and tool use [3], [4], enabling multi-step tasks rather than single answers.

This paper reviews agentic AI for healthcare assistance and proposes an architecture in which safety and escalation are explicit layers.

II. RELATED WORK

Medical knowledge and limits. Singhal *et al.* [1] showed that large language models encode substantial clinical knowledge, while Ji *et al.* [5] surveyed hallucination in natural language generation, the tendency to produce fluent but unsupported statements, which is especially dangerous in health contexts. Moor *et al.* [6] described generalist medical AI and the need for careful evaluation.

Grounding. Lewis *et al.* [7] introduced retrieval-augmented generation, which retrieves documents and conditions generation on them, reducing unsupported claims and allowing citations to trusted sources.

Symptom checkers. Semigran *et al.* [8] audited 23 symptom checkers with standardized vignettes and

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found that the correct diagnosis appeared first in about one third of cases and that triage advice was often overly cautious, establishing that such tools are preliminary aids rather than diagnostic instruments. Tu *et al.* [9] studied a conversational diagnostic AI evaluated in simulated consultations, showing progress in history-taking dialogue while stressing that the work is research, not clinical practice.

Conversational agents and adherence. Laranjo *et al.* [10] systematically reviewed conversational agents in healthcare and found limited but promising evidence. Nieuwlaat *et al.* [11] reviewed interventions for medication adherence and found that reminders and simplified regimens help, though effects are modest. Nadarzynski *et al.* [12] studied public acceptability of AI-led chatbots and found mixed trust. Table I summarizes these works.

Ref.	Author(s) / Year	Technique / Approach	Key Contribution	Limitation / Gap
[11]	Nieuwlaat et al., 2014	Adherence interventions review	Reminders help modestly	Heterogeneous studies
[8]	Semigran et al., 2015	Symptom checker audit	Limited diagnostic accuracy	Vignette-based
[10]	Laranjo et al., 2018	Conversational agents review	Promising but limited evidence	Few trials
[12]	Nadarzynski et al., 2019	Acceptability study	Mixed public trust	Survey sample
[7]	Lewis et al., 2020	Retrieval-augmented generation	Grounded, citable answers	Retrieval quality
[1]	Singhal et al., 2023	Clinical knowledge in LLMs	Expert-level exam answers	Not clinical practice
[5]	Ji et al., 2023	Hallucination survey	Causes and mitigations	General NLG
[9]	Tu et al., 2024	Conversational diagnostic AI	Strong simulated dialogue	Research setting only

TABLE I Summary of Literature Survey

III. PRELIMINARIES

1. From Chatbots To Agents

A chatbot maps a question to an answer. An agent maintains a goal, decides which tool to call, observes results and continues until the goal is met, as in the ReAct pattern of interleaved reasoning and acting [13]. Multi-agent frameworks such as AutoGen [14] let several specialized agents cooperate.

2. Capabilities Of A Healthcare Assistant

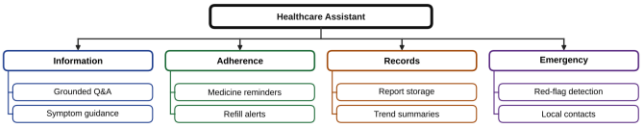


Fig. 1 organizes assistant capabilities into information, adherence, records and emergency support.

Fig. 1. Capabilities of an agentic healthcare assistant.

IV. PROBLEM STATEMENT AND OBJECTIVES

1. Identified Research Gaps

1. Language models may give fluent but incorrect health information.

2. Symptom checkers have limited accuracy and inconsistent triage.

3. Few assistants verify answers against trusted, local guidelines.

4. Responsibility for harm from automated advice is unclear.

5. Health records stored on phones raise privacy and security risks.

2. Objectives Of The Review

- To review agentic AI concepts and their relevance to healthcare support.
- To examine evidence on medical language models and symptom checkers.
- To review grounding and safety mechanisms such as retrieval and escalation.
- To propose a layered healthcare assistant architecture with explicit safety limits.
- To identify challenges in accuracy, privacy, liability and accessibility.

3. Proposed Framework

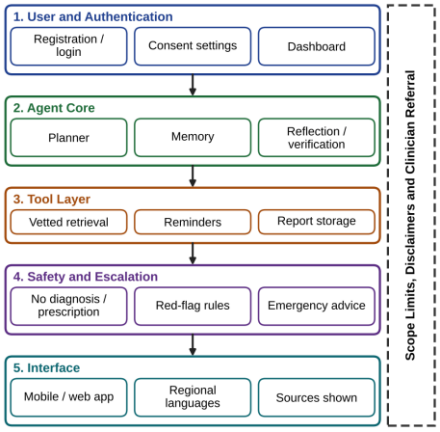


Fig. 2 shows the proposed architecture.

Fig. 2. Proposed five-layer agentic healthcare assistant architecture.

4. User And Authentication Layer

Registration, secure login and a personalized dashboard with consent settings.

5. Agent Core Layer

A planner decides which tools to use for a request; memory stores the user's medicines, allergies and preferences; a reflection step checks whether the response is supported by retrieved sources.

6. Tool Layer

Tools provide retrieval of information from vetted sources, structured symptom guidance, medicine reminders, storage and tagging of medical reports, and local emergency contact information.

7. Safety And Escalation Layer

Scope rules prevent diagnosis, prescription or dose changes; red-flag detection (for example chest pain, breathlessness, severe bleeding, suicidal thoughts) immediately advises contacting emergency services or a doctor; disclaimers accompany all information.

8. Interface Layer

A simple mobile or web interface, with large text and regional language support, presents answers with sources and clear next steps.

V. WORKING METHODOLOGY

Fig. 3 describes the workflow. Before answering, the agent retrieves supporting passages and answers only when support is sufficient:

$$\text{answer if } \max_d \text{sim}(\text{query}, d) \geq \tau, \text{ else refer to clinician} \quad (1)$$

Adherence is tracked as the proportion of scheduled doses confirmed,

$$\text{Adherence} = \text{doses_taken} / \text{doses_scheduled} \quad (2)$$

and reminders adapt to the user's response pattern.

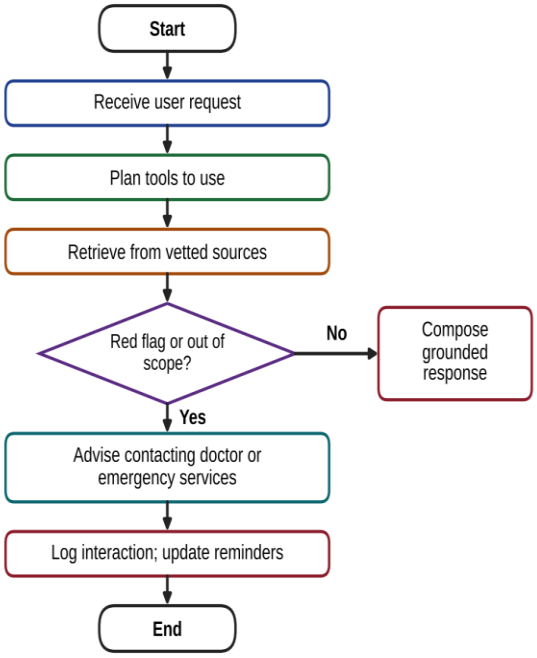


Fig. 3. Agentic healthcare assistant workflow.

VI. DISCUSSION

1. Comparison Of Approaches

Table II compares capabilities by benefit and risk, showing that reminders and record management are

low-risk and useful, while symptom interpretation needs strict limits.

Capability	Benefit	Risk	Safeguard
Medicine reminders	Better adherence	Low	User confirmation
Report management	Organized records	Privacy	Encryption; local storage
Grounded Q&A	Reliable information	Hallucination	Retrieval + citations
Symptom guidance	Early awareness	Wrong triage	Conservative rules; referral
Emergency support	Faster help	Delay if misread	Red-flag detection

TABLE II Comparison of Assistant Capabilities

2. Open Challenges And Future Work

Table III summarizes challenges. Future directions include integration with national digital health records, multilingual voice interfaces, clinician review of agent transcripts and prospective evaluation of patient outcomes.

Challenge	Mitigation
Incorrect information	Retrieval grounding; verified sources
Over-reliance	Clear disclaimers; referral prompts
Privacy of records	Encryption; consent; DPDP compliance
Liability	Information-only scope; audit logs
Digital literacy	Simple UI; voice and local languages

TABLE III Challenges and Mitigation

VII. CONCLUSION AND FUTURE WORK

Agentic AI can help people manage medicines, organize reports and find reliable general health information, and can guide them to professional care when needed. The reviewed literature shows strong medical knowledge in modern models alongside real risks of hallucination and over-confident triage. A healthcare assistant should therefore be designed with grounding, strict scope limits and escalation, supporting patient engagement while leaving diagnosis and treatment to qualified professionals.

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