

Assessing the Accuracy of Chat-GPT to Appropriately Triage Common Mohs Micrographic Surgery Post-Operative Concerns

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Table of Contents

Original Manuscript.....	4
---------------------------------	----------

Preprint
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Abstract

Artificial intelligence (AI) is increasingly integrated into healthcare, offering potential benefits in patient education, triage, and administrative efficiency. This study evaluates AI-driven dialogue interfaces within an electronic health record (EHR)/patient portal system for post-operative care in Mohs Micrographic Surgery (MMS).

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Original Manuscript

Title: Assessing the Accuracy of Chat-GPT to Appropriately Triage Common Mohs Micrographic Surgery Post-Operative Concerns

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Abstract

Artificial intelligence (AI) is increasingly integrated into healthcare, offering potential benefits in patient education, triage, and administrative efficiency. This study evaluates AI-driven dialogue interfaces within an electronic health record (EHR)/patient portal system for post-operative care in Mohs Micrographic Surgery (MMS).

Introduction

Artificial intelligence (AI) has gained widespread public adoption due to its accessibility and versatility. In 2022, OpenAI released the first publicly available AI language model capable of engaging in human-like dialogue, marking a milestone in AI integration [1].

One promising application in healthcare is AI-driven dialogue interfaces, which may be preferred by patients over static sources like FAQ pages or paper handouts. AI engines have been proposed for use in Mohs Micrographic Surgery (MMS) to assist with perioperative planning, patient education, triage, and documentation [2]. These applications offer examples of the benefits AI offers by providing individualized responses and reducing administrative burdens.

As of April 2024, a pilot program in Louisiana incorporated ChatGPT-4.0 into electronic health record (EHR) messaging to generate preliminary responses that clinicians subsequently reviewed for validity [3]. Despite its advances, this study demonstrated that human oversight in AI-generated communication remains essential [3].

While such initiatives demonstrate AI's potential to reduce administrative workload, they also underscore its role in improving patient education. Patients often recall less than half the information provided during visits, highlighting the need for accessible post-visit resources [4-6]. One study found that patients preferred video-based MMS education over traditional methods, reinforcing the role of technology in improving pre-operative patient satisfaction [7].

This study evaluates AI's utility in an EHR/patient portal system to facilitate triage and patient education in MMS post-operative care.

Methods

Common post-operative care questions were developed based on frequent MMS adverse events [8]. These included issues requiring Mohs team evaluation, events manageable at home, and benign control questions requiring no medical attention (Table 1).

Questions were input into ChatGPT-4.0 and responses were compared with American College of Mohs Surgery (ACMS) recommendations [9]. Prompts included positive (referral to Mohs surgeon) and negative responses (reassurance). Responses were scored for accuracy (5-point Likert scale: 1=not accurate, 5=completely inline with ACMS) and readability (Flesch Reading Ease Score).

Category	Questions
Infection	Do I need to see my doctor if my Mohs incision is draining fluid? Do I need to see my doctor if my Mohs incision is bright red and warm?

	Do I need to see my doctor if I have a fever after Mohs surgery?
Delayed Wound Healing	Do I need to see my doctor if my incision opens up after Mohs surgery?
	Do I need to see my doctor if my incision site turns black after Mohs surgery?
Inadequate Hemostasis	Do I need to see my doctor if my incision is bleeding after Mohs surgery?
Functional Loss	Do I need to see a doctor if I have numbness or can't move part of my face after Mohs surgery?
	Do I need to see my doctor if my incision is painful after Mohs surgery?
Negative Controls	Do I need to see a doctor if there is swelling around my incision after Mohs surgery?
	Do I need to see my doctor if I have bruising after Mohs surgery?

Table 1. Categorization of Common Post-Operative Care Questions for Mohs Micrographic Surgery (MMS)

Results

Mean accuracy scores ranged from 3 to 5. ChatGPT-4.0 accurately triaged post-operative infection and provided acceptable responses for delayed wound healing but struggled with inadequate hemostasis and functional loss. Responses to benign control questions were overly cautious, potentially leading to unnecessary concern. Readability analysis revealed scores between 22 and 46, indicating a college-level reading requirement. (Table 2)

Category	Mean Assigned Accuracy Score (5-point Likert Scale)	Mean Flesch Reading Ease Score
Infection	5	38 (College Level)
Delayed Wound Healing	4.5	38 (College Level)
Inadequate Hemostasis	3	36 (College Level)
Functional Loss	3.25	22 (College Graduate Level)
Negative Controls	3.5	34 (College Level)

Table 2. Accuracy and Readability of ChatGPT-Generated Responses for Common Post-Operative Care Questions

Discussion

ChatGPT-4.0 responses were often alarmist, with a low threshold for escalating care. While this approach is favorable to reduce legal risk, it may increase patient anxiety and unwarranted clinic

visits, adding to the Mohs team's workload. Additionally, the readability scores reflect a reading level above the national average. Misinterpretation due to limited health literacy could exacerbate patient anxiety.

AI engines provide interactive interfaces, adaptability in question phrasing, personalized responses, and multilingual support; however, they cannot generate follow-up questions or adapt to clinical nuances. This underscores the importance of human oversight in AI-generated patient communication. While current AI lacks moral accountability and liability remains on human providers, it holds potential as a complementary tool in MMS, particularly in identifying cases requiring further evaluation by the Mohs surgery team. Further research involving larger sample sizes is needed to fully evaluate AI's role in optimizing post-procedure care.

This study demonstrates that while AI is not yet ready for full clinical integration, it offers value as a supplementary tool. As MMS evolves alongside technology advancements, AI integration should be approached with optimism and caution. AI can streamline post-operative education, triage complications, and reduce administrative burdens. However, accuracy and reliability must be continuously evaluated to ensure patient safety and support nuanced clinical judgments. By integrating AI cautiously with human oversight, MMS can leverage its benefits to streamline post-operative management and improve patient outcomes.

References

1. Baker MN, Burruss CP, Wilson CL. ChatGPT: A Supplemental Tool for Efficiency and Improved Communication in Rural Dermatology. *Cureus*. 2023. 15(8):e43812. doi: 10.7759/cureus.43812. PMID: 37731429; PMCID: PMC10508964.
2. Jeha GM, Qiblawi S, Jairath N, Sable K, LeBlanc K Jr, Aylward J, Xu YG. ChatGPT and Generative Artificial Intelligence in Mohs Surgery: A New Frontier of Innovation. *J Invest Dermatol*. 2023. 143(11):2105-2107. doi: 10.1016/j.jid.2023.05.018. Epub 2023 Jun 3. PMID: 37277055.
3. Lubell, J. Never terse, always on: How AI helps clear doctors' EHR inboxes. American Medical Association. 2024. <https://www.ama-assn.org/practice-management/digital/never-terse-always-how-ai-helps-clear-doctors-ehr-inboxes>
4. Varkey P, Sathananthan A, Scheifer A, Bhagra S, Fujiyoshi A, Tom A, Murad MH. Using quality-improvement techniques to enhance patient education and counseling of diagnosis and management. *Qual Prim Care*. 2009. 17(3):2015–13.
5. Hutson MM, Blaha JD. Patients' recall of preoperative instruction for informed consent for an operation. *J Bone Joint Surg Am*. 1991. 73:160–2.

6. Fleishman M, Garcia C. Informed consent in dermatologic surgery. *Dermatol Surg.* 2003. 29:952–5.
7. Newsom E, Lee E, Rossi A, Dusza S, Nehal K. Modernizing the Mohs Surgery Consultation: Instituting a Video Module for Improved Patient Education and Satisfaction. *Dermatol Surg.* 2018. 44(6):778-784. doi: 10.1097/DSS.0000000000001473. PMID: 29642110; PMCID: PMC6794002.
8. Alam M, Ibrahim O, Nodzenski M, et al. Adverse Events Associated With Mohs Micrographic Surgery: Multicenter Prospective Cohort Study of 20821 Cases at 23 Centers. *JAMA Dermatol.* 2013. 149(12):1378–1385. doi:10.1001/jamadermatol.2013.6255
9. Castillo, J., Fathi, R., McIlwee, B., & Williams, K. Before and After Mohs Surgery: What to Expect for Patients. *American College of Mohs Surgery.* 2017.