Review Article

Artificial intelligence scribing in dermatology

Vera Wang[1]*, Andre Aabedi[1], Lana Danial[2], Haley Harper[3], Brooke Blan[4]

[1]Western University of Health Sciences College of Osteopathic Medicine of the Pacific, Pomona, California, USA
[2]A. T. Still University School of Osteopathic Medicine, Mesa, Arizona, USA
[3]Edward Via College of Osteopathic Medicine, Auburn, Alabama, USA
[4]Midwestern University Arizona College of Osteopathic Medicine, Glendale, Arizona, USA

*Correspondence:
Dr. Vera Wang,
E-mail: veracwang@gmail.com

ABSTRACT

Artificial intelligence (AI) scribing tools are transforming clinical documentation by automating note-taking through speech recognition and natural language processing. In dermatology, AI scribes offer the potential to improve efficiency, reduce physician burnout, and enhance the quality of patient care with diagnostic integration and precise visual and descriptive documentation. However, challenges remain in the form of transcription errors, integration with electronic health records, cost barriers, and concerns over data privacy. Additionally, dermatology-specific AI scribes are significantly under-researched, with only one early pilot study demonstrating promising benefits. The successful adoption of AI scribes in dermatology depends on refining language models, ensuring regulatory compliance, and tailoring systems to meet specialty-specific needs such as high-quality image documentation and description. Overall, AI scribing represents a valuable augmentative tool with the potential to reshape dermatologic care when implemented thoughtfully and ethically.

Keywords: Artificial intelligence, Dermatology, AI scribing

INTRODUCTION

Documenting visits has long been one of the main burdens physicians face, and historically has been addressed with manual scribes. Given their expensive training and high turnover rates, medicine has turned to digital scribing in recent years which has mainly revolved around voice-to-text and proofreading functions. With the rapid revolution of artificial intelligence (AI), this technology initially limited by computational capabilities and data availability can now be used to analyze complex datasets and perform tasks such as diagnostic imaging, risk assessment, and clinical decision support.[1]

AI reduces the administrative burden on healthcare providers by utilizing automatic speech recognition and natural language processing (NLP) to transcribe clinical encounters in real-time, allowing physicians to focus more on patient care rather than manual data entry. These systems can generate structured and comprehensive clinical notes, improving documentation quality and consistency. AI scribes have shown potential in reducing documentation time, decreasing physician burnout, and improving the overall efficiency of clinical workflows.[2,3]

These systems typically use machine learning models, often based on large language models, to generate structured documentation suitable for electronic health record (EHR) integration.[2] Integration with EHRs is achieved via APIs or direct interfaces, allowing generated notes to be reviewed, edited, and signed by clinicians within their existing workflow.[4,5]

In dermatology, AI scribing tools are emerging but less mature than in some other specialties. Commercially available ambient AI scribes currently do not have dermatology-specific functions such as lesion analysis and

description and can be limited in dermatologic language.[6-8]

BENEFITS OF AI DIGITAL SCRIBING IN DERMATOLOGY

Documentation plays a vital role in healthcare, from ensuring patient safety, facilitating communication, maintaining continuity of care, providing legal protection, and supporting billing and reimbursement. However, the time spent on EHRs takes up a significant portion of a physician's day. For every hour of patient interaction, physicians dedicate an additional two hours to documentation.[9] This added workload increases stress, strains patient relationships, and contributes to physician burnout.

The impact of AI scribing can vary across specialties with different needs, and has promise within dermatology. Cao et al. implemented Dragon Ambient eXperience in a dermatology clinic, demonstrating a significant reduction in time spent in EMRs from 90.1 minutes to 70.3 minutes, and a possible saving of $13,000 per year compared to an in-person scribe.[9] Although the research is limited, general trends point to AI scribes improving provider efficiency.

Accurate documentation is essential in clinical settings, especially in dermatology, where detailed descriptions of skin lesions, discolorations, rashes, and other conditions play a key role in accurate diagnosis and treatment. AI scribes have been shown to occasionally fabricate details, so careful physician review and training is vital.[10] The accuracy and efficiency of these systems will continue improving, which can help reduce errors in lesion documentation, improve the clarity of clinical notes, and provide more structured, comprehensive patient records.[11] A recent scoping review analyzing 36 studies found that AI-generated documentation can match or even exceed human accuracy and efficiency.[11] As these technologies continue to evolve and become more integrated in dermatology, there is significant potential to enhance skin assessments, improve diagnostic accuracy, and ultimately enhance patient outcomes.

AI scribing reduces the need for dermatologists to focus on a computer screen during patient encounters, leading to a more meaningful physician-patient interaction. A recent study found that while physicians spend 66.5% of their time on patient care, only 41.8% of that is spent exclusively with patients. The remainder of that time is spent documenting.[12] With the help of AI scribes, physicians can provide more active listening and direct eye contact, making patients more likely to feel more heard and understood. This increased face-to-face interaction can contribute to a better continuity of care and ensure patients receive thorough evaluations, appropriate workups, and timely treatment.

Physician burnout has been increasing, largely due to administrative burdens and excessive documentation.

EHRs are the leading source of stress in patient care, with 75% of physician burnout attributed to the documentation burdens.[13] AI digital scribes can help alleviate this strain by handing the documentation in real-time, allowing dermatologists to focus more on patient care and maintain a healthier work-life balance. This automated note-taking and reduced charting after-hours can help decrease the administrative workload, lower stress levels, and improve job satisfaction.[6] While there may be some challenges, AI has the potential to transform healthcare documentation, improve physician well-being, and provide better patient care.

CHALLENGES AND LIMITATIONS

AI scribe technology offers promising efficiency gains in clinical documentation, however still faces accuracy challenges. Early adopter insights from Mess et al. revealed that the system sometimes produces inappropriate additions or misinterprets specialized medical terminology causing distortion of the intended clinical narrative.[14] Nearly 70% of generated drafts contain errors, averaging 2.9 errors per note, and these errors may compound over time.[15] Furthermore, the complexities of medical language require advanced natural language processing capabilities that are still under development in AI transcription.[16] Critical patient details may be omitted or misrepresented, compromising patient care by affecting diagnosis and treatment decisions. While the technology offers efficiency, its limitations necessitate careful integration into clinical practice with additional safeguards to ensure patient safety and data integrity.[5] For AI transcription services to be fully incorporated into clinical practice, improvements in language processing algorithms must be made to reliably capture the intricacies of medical discourse.

Dermatology serves to benefit from AI scribes capable of advanced lesion analysis diagnostic abilities, however no such products currently exist. AI image interpretation is highly variable and although AI technologies have demonstrated melanoma diagnostic capabilities, with pooled meta-analyses reporting area under the curve values of 0.96, sensitivity of 0.89, and specificity of 0.92 for deep learning and hybrid models in diagnosing melanoma, it struggles with more variable presentations.[17] Additionally, because AI is trained on available datasets, it often underperforms with Fitzpatrick skin tones IV-VI.[18] A larger evaluation of AI to support decision-making in detecting melanoma on skin photographs, dental caries on radiographs, and diabetic retinopathy on retina fundus imaging also found that AI may not promote better or cheaper care and each situation must be separately considered.[19]

The current limitations in transcription accuracy emphasizes that it is essential for clinicians to actively review, modify, and correct AI-generated clinical documentations. The frequency of errors necessitates routine oversight to ensure patient records represent

complete and accurate details of patient records.[15] Additionally, variability in AI inputs places importances on human intervention as a safeguard for any potential miscommunication.[14] Physician monitoring AI-generated encounters provides and validates context of documented information.[16] When AI is employed as a supportive tool, rather than a standalone resource, healthcare providers can utilize its efficiency gains while concurrently maintaining high standards and quality documentation.

PRIVACY AND SECURITY ISSUES

The integration of AI in clinical documentation raises significant privacy and security challenges that must be addressed to protect sensitive patient data. AI scribe applications operate on cloud-based platforms that are in HIPAA compliance; however, the LLMs add risks associated with data retention and possible exposure of patient protected health information (PHI).[14] This emphasizes that even minor breaches in PHI breaches can have profound legal and ethical trust, potentially compromising patient trust.[8] While encryption safety measures are generally in place, the rapidly evolving nature of cyber threats underscores ongoing improvements and monitoring of current security measures.[16] These challenges extend beyond technical issues to influence patient–physician relationships and trust in digital systems, emphasizing the need for comprehensive, proactive data protection strategies.

Integration with existing systems

To effectively integrate AI scribe systems with dermatology, EHRs must support specialty-specific needs such as high-resolution clinical images and detailed lesion documentation.[8] Flaws in EHR compatibility can potentially lead to data fragmentations that do not provide a complete clinical picture of patient records.[14] Current advocacy surrounding AI scribe systems is focused on the development of tailored interfaces developed with EHR vendors to ensure all AI-generated documentation is accurately incorporated. Additionally, implementing AI tools in a practice requires clinician retraining and behavioral shifts which can temporarily interrupt workflows.[8] Small inconsistencies between AI outputs and clinical routines may lead to administrative burdens and delaying practice goals.[15] The challenges and required steps to employ AI systems can provoke resistance among providers acclimated to traditional documentation.[14] However, effective change management protocols are key when minimizing disruption to workflow. Collectively, these studies demonstrate that successful implementation of AI scribes in dermatology is multifactorial and depends on aligning technology with specialty needs.

Cost and accessibility

Seamless adoption and implementation of AI scribe technology is hindered by concerns with cost and accessibility, with small or resources-limited practices being the most impacted. While monthly subscription fees associated with AI scribes are generally lower than traditional scribe salaries, there are upfront investments in hardware, software, and infrastructure that can cause resistance. These initial costs combined with ongoing expenses associated with system maintenance, software updates, and technical support can pose a significant burden, especially for smaller practices.[8,15] Without scalable and affordable AI models, the costs may exacerbate the digital divide, further leaving rural or underserved populations at a disadvantage.[16] Additionally, maintaining the functionality of AI necessitates ongoing updates to address security vulnerabilities that can lead to data breaches. Failure to maintain and adapt the technology can compromise reliability and utility over time.[14,15] Long term success with AI scribe technology depends on both initial adoption and consistent support and clear financial incentives.[8] These findings demonstrate the urgent need for cost-effective, well-supported solutions to provide equitable access to AI scribe systems across diverse healthcare settings.

CONCLUSION

AI scribing demonstrates a promising future in dermatologic documentation. To comfortably adopt AI scribing as a standard of practice, current challenges must be addressed and the technology must continue to be refined. Daniel et al recognize the potential of various uses of AI in dermatology, including dermatopathology, dermatologic research, generative AI, and image-based AI for diagnostics, to transform healthcare. Developmental opportunities in dermatologic AI include purifying AI-assisted differential diagnosis and treatment recommendations, smart documentation with image recognition for lesion tracking, and the integration of AI diagnostic tools into teledermatology. Ethical and policy-related regulations surrounding the appropriate balance between AI assistance and physician oversight will also continue to develop with the technology.

Implementation in dermatology clinics involves workflow integration, physician training, and change management to address adoption barriers. Training typically includes onboarding sessions and ongoing support to ensure accuracy and clinician confidence. Cost and resource considerations include subscription or licensing fees, IT infrastructure, and potential workflow disruptions during adoption. While AI scribes may reduce documentation time and burnout, cost-effectiveness in dermatology remains marginal, with benefits highly dependent on local workflow and payment models. Data privacy, accuracy, and regulatory compliance are critical considerations for successful deployment.

Overall, AI scribes are likely to serve as augmentative tools rather than replacements for clinical expertise, with their success hinging on addressing confabulation, ensuring data privacy, and achieving seamless integration into dermatology workflows.

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