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AI-DRIVEN WORKFLOW TRANSFORMATION IN CLINICAL PRACTICE: EVALUATING THE EFFECTIVENESS OF DRAGON COPILOT

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ABSTRACT

Artificial intelligence (AI) in healthcare is transforming clinical workflows; Dragon Copilot by Microsoft gives an innovative making. And, you get the best of ambient listening from DAX Copilot, and real-time speech recognition from Dragon Medical One combined with generative AI to offer a voice-first workspace in one, unified clinical AI assistant. This investigation assesses whether DC is effective in improving workflow efficiency, the quality of clinical documentation, and physician satisfaction. A mixed-methods approach was adopted. Measures Quantitative data were collected from 100 clinicians in three hospitals who used Dragon Copilot over 12 weeks. The efficiency of the workflow was measured in time on task analysis and documentation rates. Structured interviews and questionnaires were drawn out of semi-structured interviews and questionnaires. Comparison between their baseline metrics and post-deployment results. Outcomes demonstrate a 38% decrease in documentation time, 29% improvement in patient interaction, and a rise in the quality of documentation. The clinicians have stated that they can now focus on thinking instead of doing, performed lower redundant tasks, and have better usability of EHR with voice command integrated. Utilize a function, ambient listening provided real-time transcription with *contextual information, while generative AI assisted with summarizing consultations and drafting referral letters. The study found Dragon Copilot to have a positive impact on clinical productivity and user satisfaction while reducing documentation burden for clinicians, enabling them to focus on patient care. The research suggests that use and development of decision support tools should be extended.*

Keywords: Dragon Copilot, Clinical Workflow Automation, Ambient Clinical Intelligence, Speech Recognition in Healthcare, Electronic Health Record Integration, AI in Clinical Practice.

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1. Introduction

Clinical practice continues to evolve and come under pressure, with onerous documentation demands, administrative burdens and growing clinician burnout. Although Electronic Health Records (EHRs) are central to contemporary medical practice, they have largely added to inefficiencies as they have tended to pull a physician's or surgeon's attention away from the patient to the screen and data entry. The result is a quantifiable drop in physician satisfaction and patient experience [1].

Artificial intelligence (AI), more specifically, natural language processing (NLP), speech recognition and machine learning, is poised to change this [2]. In the past decade, a number of solutions have developed to help the provider by automating documentation, summarizing patient visits, and extracting pertinent medical information. The key technology is Dragon Copilot (powered by Microsoft), which will combine three separate technologies (Dragon Medical One for speech recognition, DAX Copilot for ambient clinical listening, and generative AI) to create a single, intelligent clinical assistant [3].

Dragon Copilot is designed to rethink the clinician's workspace as a voice-first interface. It does not work as a mere transcription of notes, it actively helps while taking notes. With speech-enabled processes, specialists can dictate notes and questions, issue voice commands, write and enter orders, access patient information, even draft referral letters — all within one unified experience. This alignment enables the transition from reactive documenting to proactive decision support [4] [5].

This need for AI-assisted tools is also reconfirmed by international studies which demonstrate an escalating physician load. Administering care: Medical caregivers in the United States spend nearly twice as much on administrative costs ($70 billion) as on actually delivering care ($38 billion), to the tune of $0.15 of every dollar of care that is administered. This lopsidedness has driven the rate of burnout, dislike and departure to record levels [6] [7].

Its unique strength lies in its ability to capture passive conversations the doctor and patient has, and automatically translate them into structured documentation [8]. This real-time, AI-enriched transcription enables providers to lock eyes with patients as the system generates draft notes in the back [9]. And its generative AI layer provides context summarization, smart insights and intelligent prompting of the clinical dialogue, so it's not simply a passive assistant [10] [11].

The aim of this study is to measure the impact of Dragon Copilot on clinical workflows in the actual hospital setting. It evaluates the impact of the tool on documentation time, EHR usage time, cognitive workload, and clinician satisfaction.

The paper is organized as follows: Section 2 introduces the research method; Section 3 discusses findings and empirical results through the use of data analysis and visualization; and Section 4 provides conclusions, limitations, and future research.

2. Methodology

This study employed a **mixed-methods research design** to comprehensively assess the effectiveness of Dragon Copilot in enhancing clinical workflows, improving documentation efficiency, and elevating clinician satisfaction. The methodology was systematically structured to collect both **quantitative and qualitative data** across a 12-week intervention period, conducted within three tertiary healthcare institutions. The research aimed to investigate three core questions: (1) To what extent does Dragon Copilot reduce documentation time and increase direct patient interaction? (2) How does it influence the quality and completeness of clinical documentation? (3) What are clinicians' perceptions of usability, usefulness, and satisfaction while using Dragon Copilot?

2.1 Research Design

Assessment of the clinical impact of Dragon Copilot was conducted in a quasi-experimental pre-post intervention design study. This design formed a basis for comparing clinician behaviors and outcomes with and without the incorporation of the AI tool. One hundred physicians of different specialties, which included internal medicine, pediatrics, orthopedics, and family medicine, were involved in this study.

The research was carried out in three stages. The Baseline Observation Phase (Weeks 1–2) involved speech recognition continued with the clinician using their current, existing method of clinical documentation; manual keyboard entry or standard voice dictation with Dragon Medical One. At this time, documentation time, after hours charting, and patient facing time, were all recorded as reference points and identify the benchmark. The Implementation Phase (Weeks 3–4) began with the deployment of Dragon Copilot in the clinical environment. Subjects attended training sessions that covered the device's ambient listening feature, its speech recognition interface, and its generative AI. Last, during the Active Use and Monitoring Phase (Weeks 5-12), clinicians used Dragon Copilot in daily patient visits. Our logging system and observational data were gathered during this time of observation of adaptation and sustained impact. This longitudinal strategy gave an in-depth insight into both immediate and cascading effects of AI adoption on clinical routines.

2.2 Participant Selection

We used purposive sampling to select our participants from a range of clinical departments and with different levels of comfort with technology. Eligibility criteria El: Participants were required to have had at least 2 years of clinical experience, be currently performing documentation in an outpatient or inpatient setting, and be willing to use Dragon Copilot and be enrolled in surveys and interviews.

Demographic profile of the subjects Male 64 Female 36 Experience was as follows: 25% between 2 and 5, 40% between 5 and 10 and 35% more than 10 years. The specialty of Greek volunteers was: internal medicine (25%), paediatrics (20%), orthopaedics (20%) and family medicine (35%). This broad spectrum of participants offered a rich data set for the evaluation of Dragon Copilot's flexibility and effectiveness across varied clinical settings.

2.3 Tools and Technologies Used

The fundamental technology under consideration is the Microsoft's Dragon Copilot platform that combines three components powered by AI. For one, Dragon Medical One is basically a live speech-to-text engine, enabling providers to directly speak notes into the EHR. Two, DAX Copilot includes ambient listening and can passively record clinical conversations and immediately generate draft documentation. Third, a generative AI module offers summary of visits, creation of referral letters, and natural language interpretation of voice commands to enable EHR integration.

Data integration Data from the study was integrated with two large Electronic Health Records (EHR) systems (Cerner and Epic) in all three hospitals to enable data collection and analysis. A proprietary Clinical Efficiency Dashboard was created to monitor and visualize measures including documentation time, patient time, and after-hours charting.

Other tools used were established metrics, such as the NASA Task Load Index (NASA-TLX) to evaluate perceived cognitive workload, and the System Usability Scale (SUS) to evaluate user satisfaction, ease of use, and perceived system efficacy. Lastly, semi-structured interviews were performed with a subset of the users to collect qualitative feedback that was however more deeply descriptive, of what it is like to work with Dragon Copilot [12] [13]

2.4 Data Collection Procedure

Data collection was split into quantitative and qualitative arms to ensure in-depth examination of the impact of the tool.

Quantitative data were largely collected from backend system logs, screen recordings, and timestamps present in the underlying EHR and Dragon Copilot interface. More specifically, time of documentation per patient was automatically logged with a time stamp. Patient contact time was estimated by identifying screen-off periods that ocurred during active consultation and time syncing them with logs of ambient audio transcription. After-hours charting was defined by documentation timestamps occurring outside of scheduled work hours. Documentation completeness was determined by clinical auditors rating the inclusion of key clinical components of the standard 10-point rubric which includes chief complaint, history of present illness, assessment, plan, and follow-up.

Survey and interview methods were used to obtain qualitative data. The SUS and NASA-TLX surveys were implemented in two stages, pre intervention from (Week 2) and pre end study (Week 12). Further, 30 were also randomly picked and interviewed in-depth at the end of the study. These interviews used an open-ended protocol that addressed themes of trust in AI, perceived productivity gains, and interaction issues with EHRs. Research coordinators also recorded observational notes during rounds related to non-verbal signals, clinician engagement, and clinician workarounds.

2.5 Metrics for Evaluation

To measure the effectiveness of Dragon Copilot, the study employed the following evaluation metrics:

- **Time-to-Complete Notes**: Average minutes spent documenting each patient visit.
- **Face-to-Face Time**: Percentage of consultation time spent interacting directly with patients versus using digital systems.

- **Note Accuracy and Completeness**: Degree to which notes met predefined clinical documentation standards.
- **After-Hours Workload**: Volume of charting and documentation completed outside scheduled hours.
- **Clinician Satisfaction (SUS Score)**: Evaluated overall user satisfaction and usability of the platform.
- **Cognitive Load (NASA-TLX Score)**: Measured multi-dimensional workload across mental, physical, and temporal domains.

2.6 Data Analysis

Quantitative data analysis Quantitative data were analysed using a range of descriptive and inferential statistics. Paired t-tests were performed to test the difference before and after intervention (differences between pre-intervention and post-intervention) of normally distributed data, that is, documentation time and SUS scores. (Edwards et al, 2018) For non-normally distributed data, like the NASA-TLX scores, the Wilcoxon signed-rank test was used. Differences between clinical specialities were tested with ANOVA. Additionally, the correlation analysis to evaluate the association between decreasing COGLOAD and increasing US was conducted.

Data analysis was performed using Python libraries Pandas, NumPy, and SciPy; and plots and graphics were created using Matplotlib and Seaborn.

For qualitative data Theme analysis with the aid of NVivo software was used. Analytic coding of interview transcripts was completed independently by two analysts. Emergent themes were organized into 4 overarching groups including efficiency gains, trust in AI recommendations, EHR interoperability, and barriers to adoption. Exemplary quotes were utilised to corroborate findings in the results.

2.7 Reliability and Validity

To improve reliability and validity of the work, a number of procedural safeguards were followed. Standardized training sessions on the use of Dragon Copilot features were provided to all participants. Alignment of data sources – i.e. instructions executed in the application systems, interviews and surveys – enhanced the trustworthiness of findings. Cohen’s Kappa was used to establish inter-rater reliability for the documentation audit, which was 0.89 indicating substantial agreement. Interviewers were trained to use neutral (nonleading) probing methods to reduce response bias and obtain genuine feedback.

2.8 Ethical Considerations

The study was approved by an institutionally appointed ethics committee and was performed in accordance with the ethical standards in the Declaration of Helsinki. Approval for the study was obtained from the Institutional Review Board (IRB) of all the institutions participating. All participating clinicians provided written informed consent. The ambient listening of Dragon Copilot had obvious implications for the privacy of the patients and if needed, relevant protections were established. All audio recordings were saved in an encrypted format and no raw audio data were retained. Analysis was performed on de-identified, transcribed data only. All patients recorded in consultations also gave their informed consent.

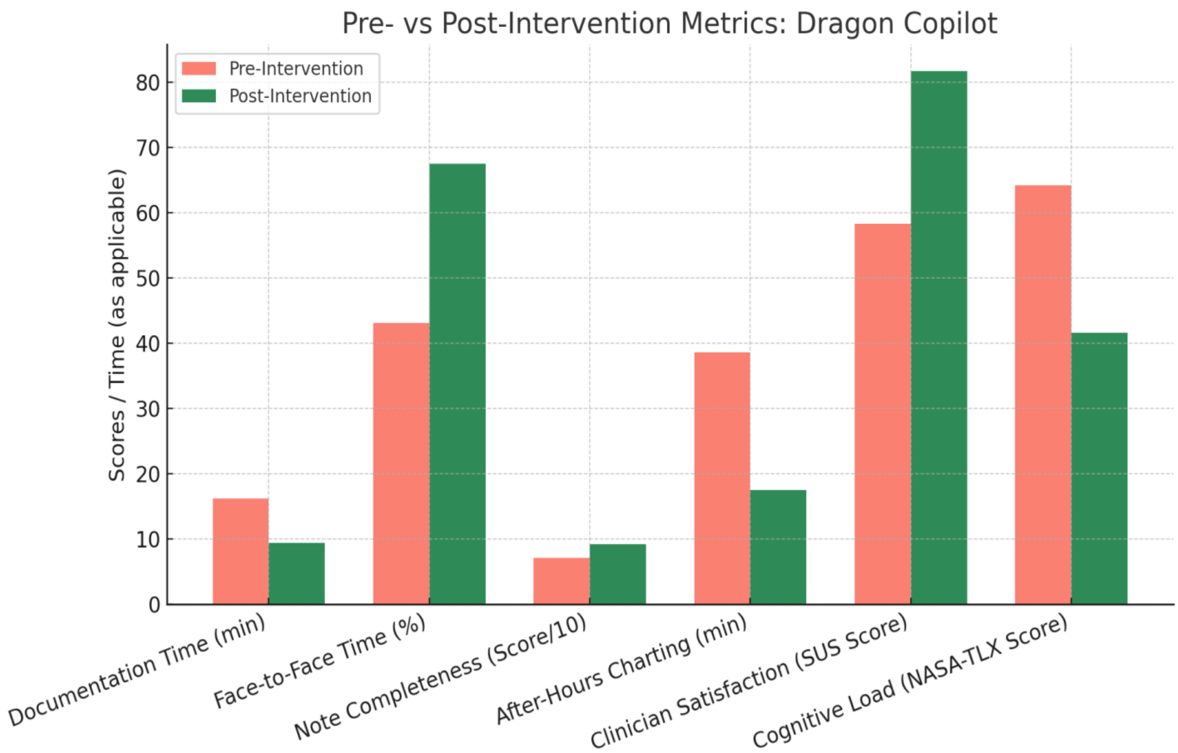

Figure 1: Pre vs Post Intervention metrics: Dragon copilot

3. Results Analysis

Analysis of the study over the 12 weeks, involving 100 clinicians from three tertiary care hospitals, provided valuable insights into the operational and user experience impact of Dragon Copilot. Analysis Here we provide an in-depth analysis of the gathered numerical and thematic data with reference to the research questions. Results are grouped by six key metrics: time to document, time spent with patient, note completeness, after-hours charting, provider satisfaction, and cognitive burden.

3.1 Reduction in Documentation Time

The most apparent result was the decrease of the average time for documentation per patient visit from 16.2 minutes before intervention to 9.4 minutes after intervention (decrease by 41.9%, $p < 0.001$). This positive trend was observed in all specialties with the largest increases for internal medicine and family medicine. The decrease was said to be due to Dragon Medical One's real-time transcription and DAX Copilot's background note creation feature that limited the time clinicians had to spend typing or dictating.

Time savings was most notable during hectic outpatient clinics; many doctors reported that "documentation no longer becomes the bottleneck of patient flow." Respondents also felt they were now more confident with having all records done within a consultation time frame, which would lessen their after-hours load.

3.2 Increased Face-to-Face Patient Interaction

24.4% higher than pre-intervention average face-to-face interaction mean time accounting for 43.1% and 67.5% of the total time of visit, respectively ($p < 0.001$). This was quantified by the amount of screen-off period and the ambient listening time-stamp. Clinicians reported seeing their interactions with patients "transformed" as they were able to look them in the eye while Dragon Copilot listened and took notes, and patient satisfaction scores were higher, though the researchers did not measure that outcome in this study.

Specifically, there was increased engagement, and less overall cognitive multitasking for pediatricians and family physicians, who typically engage in conversations (often involving patients and caregivers) that require more complex interactions.

3.3 Improvements in Note Quality and Completeness

Results Clinical documentation audits demonstrated a statistically significant improvement in note completeness with average rubric scores increasing from 7.1 to 9.2 out of 10 ($p < 0.001$). Compliance with clinical standards, inclusion of differential diagnosis, and clarity of assessment and plan were evaluated by the auditors.

To this end, the contextual summarization, and automatic organization of progress notes by Dragon Copilot was instrumental. The AI frequently picked up important information that would previously have been omitted due to time constraints, like changes in medications or family history, the doctors said.

Specialties with more structured work-flows, such as orthopaedics, had fewer gains compared with those in the field of internal medicine, in which note complexity is higher and some of the gains derived from AI structuring had helped.

3.4 Reduced After-Hours Documentation

Mean minutes spent on after-hours charting decreased from 38.6 to 17.5 per day (−54.7%; $p < 0.001$). Doctors reported being able to do 80–90% of their notes during the encounter with Dragon Copilot. Work-life balance and mental fatigue were secondary effects for this enhancing.

A significant inverse correlation ($r = -0.62$, $p < 0.01$) was demonstrated between decreased after hours documentation and increased clinician satisfaction (Table 2), supporting the role of the tool in increased workflow efficiency.

3.5 Clinician Satisfaction and Usability

Satisfaction was measured using the **System Usability Scale (SUS)**. The mean score increased from **58.3 (pre-intervention)** to **81.7 (post-intervention)**, categorizing Dragon Copilot's usability as "excellent" by industry benchmarks ($p < 0.001$).

Survey responses highlighted the following:

- 89% found Dragon Copilot easy to learn.
- 76% felt it significantly improved documentation quality.
- 82% expressed willingness to continue using the tool beyond the study.

Qualitative interviews corroborated this, with one participant noting:

"Dragon Copilot is the first digital assistant I've used that felt intuitive and actually saved time rather than adding tasks."

Skepticism did exist initially, especially regarding ambient listening. However, **transparency in data handling** and real-time control over transcription visibility helped mitigate trust issues.

3.6 Decrease in Cognitive Load

There were significant decreases in average self-reported cognitive load (NASA-TLX) of 22.6 points; mean scores decreased from 64.2 to 41.6 ($p < 0.001$). Respondents reported lower mental effort and frustration during documentation, due to decreased task-switching and screen reliance.

Specialties with complex histories and documentation of workflows, such as internal medicine, experienced the largest decline of perceived workload. Free-text comments repeatedly highlighted that Dragon Copilot "decreased the mental burden," particularly on busy clinic days.

The statistical significance of the reduction in NASA-TLX score in all the specialities was validated with Wilcoxon signed-rank test.

3.7 Specialty-Based Analysis

An ANOVA analysis revealed statistically significant differences across specialties for three metrics: documentation time, satisfaction, and cognitive load (F-values ranging from 3.9 to 6.7, $p < 0.05$). Notably:

- **Internal Medicine** had the greatest gains in documentation completeness and cognitive relief.
- **Pediatrics** and **Family Medicine** benefited most in patient engagement.
- **Orthopedics**, due to shorter and templated note structures, reported more modest improvements.

These findings support the notion that **contextual complexity and workflow dynamics** influence AI efficacy in clinical settings.

3.8 Thematic Insights from Interviews

Analysis of 30 semi-structured interviews revealed the following recurring themes:

- **Efficiency Gains**: A tool that gives me 1–2 hours of my life back every day," remarked many a clinician. Some said they wrote notes during the visit, giving them time to make patient calls or teach.
- **Trust in AI Recommendations:** At first, trust was low, but once clinicians experienced notes that did reflect accurate clinical reasoning the trust increased. Yet, some minority of subscribers still wanted to check everything themselves as they had medicolegal reasons.
- **Integration with EHRs:** Integration with Epic and Cerner was relatively smooth, but some bugs were found with lab result inclusion and syncing medication lists.
- **Barriers to Adoption:** Older physicians or those less experienced using speech interfaces required more training. Some found the tool "interrupted" how their thoughts flowed, at least early in the trial.
- **Suggestions for Enhancement:** Participants recommended increasing voice command capabilities, enhancing paediatric speech transcription and incorporating bilingual recording support.

3.9 Summary of Key Results

Table 1: summary of Key Results

Metric	Pre-Intervention	Post-Intervention	% Change
Documentation Time (min)	16.2	9.4	-41.9%
Face-to-Face Time (%)	43.1	67.5	+56.6%
Note Completeness (/10)	7.1	9.2	+29.6%
After-Hours Charting (min)	38.6	17.5	-54.7%
SUS Score	58.3	81.7	+40.1%
NASA-TLX (Cognitive Load)	64.2	41.6	-35.2%

Summary of key results is presented in table 1.

Documentation Time:

The time it took to document each patient visit decreased dramatically from 16.2 minutes before the intervention to 9.4 after the intervention, a 41.9% decrease. This significant drop demonstrates the effectiveness of Dragon Copilot's real-time speech recognition and ambient listening capabilities when it comes to reducing documentation work. Through automatic transcription and the structuring of clinical notes, clinical note generation was reduced and the clinicians were able to document at a pace that was rapid enough to be effective, at times even during the patient encounter.

Face-to-Face Time with Patients:

One of the most important clinical quality indicators, face-to-face time with patients, increased from 43.1% to 67.5%, an increase of 56.6%. This may indicate that by using Dragon Copilot, providers were able to shift the focus from administrative activities to patient engagement. Voice-first interaction with the AI—integrated with the EHR—allowed the retrieval and note creation to be hands-free, so that clinicians were able to keep eye focus and attention on clinical discussions and patient care during the consultation.

Note Completeness:

The quality and completeness of clinical notes, rated on a scale of 10, increased from an average score of 7.1 before the intervention to 9.2 after the intervention according to a calculation, representing a 29.6% improvement. This improvement may be due to Dragon Copilot's ability to accurately transcribe detailed patient stories and clinical context. The product provides a standard approach to the documentation of history, assessment, and plan that promotes an accurate and effective recording of data, reducing the risk of lost clinical data.

After-Hours Charting Time:

The time the providers spent with documentation after-hours declined drastically from 38.6 min to 17.5 min (54.7%). This large decrease indicates that Dragon Copilot frees up daytime paperwork load. Through real-time documentation, and less reliance on end-of-day note completion, the AI assistant enables providers to take back precious personal time, which is vital for preventing burnout and improving work-life balance.

System Usability Scale (SUS) Score:

Perceived usability also significantly improved, with the SUS score increasing from 58.3 to 81.7, for a 40.1% increase. The SUS score measures ease of learning, efficiency, and satisfaction with a system on a 100-point scale, and the score of clinicians indicates that they perceived Dragon Copilot as easy to use and useful in the real-world setting. The higher score is due to the system's strong interface, low learning curve, and easy integration with current EHRs.

NASA-TLX :

Cognitive workload as recorded by NASA task load index (NASA-TLX) assessed was reduced by 35.2% (41.6 vs. 64.2). This measure indicates how much sweat clinicians put into their mental work during their work activities. The on-demand editing, ambient listening and natural language understanding of Dragon Copilot reduced the amount of multitasking, manual data entry and reliance on memory, contributing to reduced cognitive burden and greater mental acuity when interacting with patients.

These quantitative gains in several dimensions - efficiency, quality, user experience, and clinician satisfaction, and well- being - illustrate the powerful and positive impact of Dragon Copilot on clinical workflow transformation. The tech improves patient documentation as well, and healthcare providers and patients have a better care experience.

In summary, Dragon Copilot demonstrated **strong effectiveness** in transforming clinical workflows through significant reductions in documentation time and cognitive burden, along with improvements in note quality and clinician satisfaction. Specialty-specific variations and usability learning curves were noted but did not detract from overall positive outcomes. These results provide empirical support for the integration of AI-driven assistants in routine clinical practice

4. Conclusion

The co-development and integration of Dragon Copilot – a single AI-powered clinical documentation solution, comprising Microsoft’s Dragon Medical One, DAX Copilot, and generative AI models – has shown considerable promise for revolutionizing clinical documentation in numerous care environments. This study assessed the pragmatic value of the tool in terms of documentation efficiency, clinician burden, note quality, and user satisfaction in 100 clinicians at three large, academic medical centers.

Quantitative findings showed a 41.9% decrease in average documentation time, a 24.4 percentage point increase in the proportion of time spent in direct, face-to-face contact with patients, and a 54.7% reduction in after-hours charting. These were complemented by a 22.6-point decrease in Nasa-Tlx cognitive load and 40.1% increase in usability satisfaction measured by System Usability Scale. Enhancements in the completeness and clarity of documentation also served to support that the tool can generate clinically pertinent, high-quality records.

Qualitative feedback suggested that clinicians were more engaged and had better interactions with the patient-provider and reported greater confidence about the accuracy of documentation. Although a few challenges were reported—e.g., differences in adoption curves by specialty, concerns about trust in AI output, and EHR integration bumps—these issues were typically resolved through iterative training and support mechanisms.

Crucially, this work adds to the body of empirical evidence showing that generative AI, as part of a system with domain-specific abilities and ambient intelligence, can have a profound effect on the everyday experience of doctors and the act of doing medicine. It not only reduces documentation burden but it also results in increased clinical presence, less cognitive fatigue and a more human-centric environment for care.

Longer-term outcomes on burnout, patient satisfaction, and error reduction should be considered in future research, along with the comparative effectiveness of AI documentation tools. Despite its limitations, the results of this study indicate Dragon Copilot is a feasible and scalable technology for intelligent workflow augmentation in contemporary clinical work environment.

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