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Could ambient artificial intelligence scribes offer a promising digital health solution to reduce physician burnout and documentation burden in Poland? A narrative review

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A – Development of the concept and methodology of the study; B – Query – a review and analysis of the literature; C – Submission of the application to the appropriate Bioethics Committee; D – Collection of research material; E – Analysis of the research material; F – Preparation of draft version of manuscript; G – Critical analysis of manuscript draft version; H – Statistical analysis of the research material; I – Interpretation of the performed statistical analysis; K – Technical preparation of manuscript in accordance with the journal regulations; L – Supervision of the research and preparation of the manuscript

Abstract

Introduction and objective. Physician burnout and documentation burden reduce patient-facing time and professional well-being. Ambient artificial intelligence (AI) scribes automatically convert clinician–patient conversations into structured clinical documentation and may improve workflow efficiency and reduce clinician documentation burden. This review summarises current evidence regarding their effectiveness, safety and potential application in Poland.

Review methods. A narrative review of publications (2019-2026) was conducted using the following databases: PubMed/MEDLINE, Embase, Web of Science databases. Polish-language literature, policy documents and regulatory acts were also reviewed. Evidence regarding documentation efficiency, physician well-being, patient acceptance, implementation in Poland and legal considerations was synthesised.

Brief description of the latest state of knowledge. International studies, including randomised controlled trials, demonstrate that ambient AI scribes reduce documentation time, administrative burden, and physician burnout, though patient acceptance depends on digital literacy and trust in data privacy. Although peer-reviewed Polish implementation studies are lacking, domestic research initiatives, emerging hospital pilots and national digital health strategies indicate growing readiness for adoption. Implementation requires compliance with the GDPR, the EU AI Act and appropriate clinical governance.

Summary. Ambient AI scribes represent a promising digital health solution designed to reduce documentation burden and supporting physicians in Poland. Prospective Polish pilot studies are needed to evaluate effectiveness, safety, and regulatory compliance before routine clinical implementation.

Keywords: primary health care, professional burnout, artificial intelligence, electronic health records, medical records systems computerized, speech recognition software.

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INTRODUCTION

Clinical documentation has become one of the primary contributors to physician burnout globally. Studies using electronic health record (EHR) log data and direct observation consistently demonstrate a substantial documentation burden: physicians actively use EHRs for an average of 16 minutes per patient encounter, with primary care physicians spending a significant proportion of their working day on EHR tasks, including after-hours documentation [1,2]. A nationwide longitudinal study revealed that 62.8% of US physicians experienced at least one manifestation of burnout during the pandemic peak, driven by systemic professional stressors and a mismatch between professional demands and work-life balance [3]. This crisis is further contextualised by a recent review highlighting wide variability in reported prevalence – from 0% to 80.5% – due to inconsistent definitions and measurement methods [4].

In Poland, these pressures are compounded by structural workforce deficits. Poland has only 3.5 physicians per 1,000 inhabitants compared with the EU-27 average of approximately 3.8, and 13 of 30 shortage occupations identified by the Polish Ministry of Family and Social Policy are health and care professions [5,6]. A 2025 qualitative study of Polish healthcare stakeholders identified high workload, administrative burden and hierarchical organisational culture as primary structural drivers of burnout [5]. Physician emigration further compounds these structural pressures [6].

Ambient AI scribes – software systems that passively record clinician–patient conversations using automatic speech recognition (ASR) and large language models (LLMs), then automatically generate structured clinical notes – have attracted growing international interest as a scalable response [7, 8]. Several Polish-language commercial vendors (VocaMed, Ozana AI Scribe, Plato MedScribe) have entered the market,

and domestic academic development is emerging. Growing interest in AI tools among health professionals has been documented across various healthcare education and clinical settings [30].

Objectives

This narrative review synthesises the international evidence on ambient AI scribe effectiveness and safety, characterises the current deployment status and readiness within Poland, assesses the potential benefits for the Polish healthcare system and evaluates data safety and regulatory implications under Polish and EU law.

REVIEW METHODS

The narrative review was conducted in accordance with standard reporting conventions for narrative reviews, addressing the core domains assessed by the Scale for the Assessment of Narrative Review Articles (SANRA). Literature searches were performed in databases PubMed/MEDLINE, Embase and Web of Science between January 2019 and June 2026 using terms related to ambient AI scribes, clinical documentation, physician burnout, EHR burden, patient consent, AI data safety, and the Polish healthcare workforce. Polish-language sources were searched via Polska Bibliografia Lekarska (PBL), the OSOZ platform, and institutional repositories. Policy documents from the Polish Ministry of Health and Centrum e-Zdrowia were reviewed, as were the EU AI Act (Regulation (EU) 2024/1689) and the GDPR (Regulation (EU) 2016/679). Preprints were included where peer-reviewed versions were unavailable. Where no peer-reviewed Polish-language sources were identified, relevant grey literature, including policy documents, institutional communications, and media reporting, was included and is explicitly identified as such in the reference list. Studies were included if they reported empirical data on documentation time, physician wellbeing, patient outcomes, or safety in the context of ambient AI scribe use, or if they addressed regulatory, linguistic, or implementation aspects relevant to the Polish healthcare context. No minimum study size or design threshold was applied, given the nascent state of the field. However, peer-reviewed sources were prioritised over grey literature throughout. Eligible sources were limited to English- and Polish-language publications; records in other languages were excluded. Sources were excluded if they did not provide primary empirical, policy or implementation-relevant content (e.g., opinion pieces, editorials, and conference abstracts without extractable data), or if they addressed non-clinical or non-healthcare applications of ambient AI transcription unrelated to physician documentation.

BRIEF DESCRIPTION OF THE STATE OF KNOWLEDGE

Technical components of ambient AI scribes

Ambient AI scribes integrate three core technical layers: automatic speech recognition (ASR), natural language processing (NLP) and LLMs [7,8]. The ASR layer transcribes the clinician–patient conversation in real time. The NLP and LLM layer identify clinical entities, structure the content into specialty-specific templates and generate structured notes that are delivered to the EHR as a pre-populated draft for physician review [9]. Figure 1 illustrates the main components and data flow. Mandatory clinician review and sign-off is a non-negotiable safeguard: no vendor accepts clinical liability for generated notes, and the signing physician retains full medical-legal responsibility [8,10].

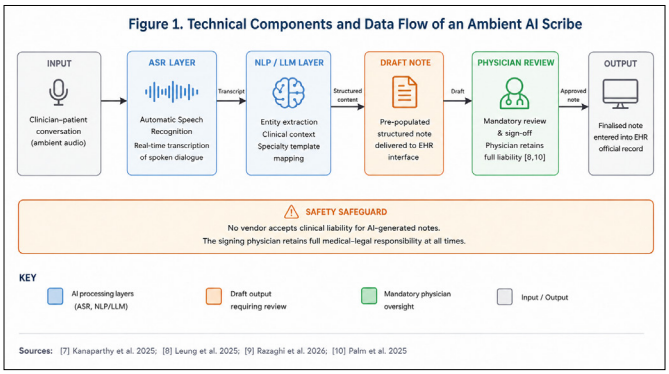

FIGURE 1. Technical components and data flow of the ambient AI scribe.

International evidence on effectiveness

Multiple studies demonstrate consistent reductions in documentation time. Duggan et al. reported a 20.4% time reduction (10.3 to 8.2 min per note; $p < 0.001$) among 46 clinicians using Nuance DAX Copilot [11], and Stults et al. found documentation time fell from 6.2 to 5.3 min per encounter among 57 clinicians using Abridge [12]. The most relevant European evidence is a 2026 Dutch multicentre study (n = 535 general practice consultations) demonstrating a significant reduction in GP documentation time and perceived workload, with maintained consultation duration and patient satisfaction [13].

In a three-arm RCT (n = 238 outpatient physicians, 14 specialties) participants were assigned 1:1:1 to Microsoft DAX Copilot, Nabla, or usual care, with both AI arms reducing documentation time in note [14]. The pragmatic stepped-wedge RCT (n = 66 practitioners) found significant improvements in professional fulfilment and work exhaustion [15]. A quality-improvement study across six US health systems (n = 263) reported burnout prevalence falling from 51.9% to 38.8% after 30 days, with additional improvements in cognitive task load and after-hours documentation [16]. Patient acceptance has been consistently high (opt-out rate 0.014% in one large deployment [17]), and prospective time-motion data (n = 169 consultations) showed significantly greater clinician eye contact without extending consultation duration [18].

The primary safety concern is AI-generated note inaccuracy. A validated quality-assessment study found errors across multiple specialties, with physical examination findings most vulnerable to errors [10]. Automation bias – uncritical acceptance of AI-generated content – represents a compounding risk [7,9].

Current status of ambient AI scribes in Poland

No peer-reviewed studies of completed, controlled ambient AI scribe trials have been identified from Polish clinical settings. However, several developments indicate that momentum is building.

The most substantive domestic academic work is the ADMEDVOICE project, the result of a collaboration between Gdańsk University of Technology (Politechnika Gdańska) and Gdańsk Medical University (GUMed). The project has produced a peer-reviewed Polish medical speech dataset [19]

comprising nearly 15 hours of audio from 28 speakers with domain-specific medical vocabulary. Using the Whisper model, the word error rate was reduced from 24.03% to 13.91%. On the basis of these results, the consortium developed an AI platform for voice-input medical records incorporating ASR and context analysis tailored to Polish regional accents and complex medical terminology [20]. A complementary paper, ADMEDTAGGER, describes an annotation framework using a multilingual LLM to classify Polish medical texts across five specialties (Radiology, Oncology, Cardiology, Hypertension, Pathology), achieving F1 scores above 0.80 for each [21]. The platform is reported to be undergoing hospital testing at the University Clinical Centre in Gdańsk [20], representing the most advanced, peer-reviewed Polish-language infrastructure for ambient medical documentation identified in this review.

Regional media coverage from March 2026 reported the introduction of Heidi Health – an Australian-developed ambient AI scribe, colloquially called "Skryba AI" – at the Emergency Department (Szpitalny Oddział Ratunkowy, SOR) of Poznań University Hospital (Uniwersytecki Szpital Kliniczny w Poznaniu) [22,23]. The introduction attracted public attention when a patient-facing notice was photographed and shared on social media, generating debate about data security and patient rights – illustrating the importance of proactive communication in any future deployment [23]. According to a statement by hospital spokesperson Bartosz Sobański, the system operates outside the hospital network and databases, requires no patient personal data to be entered and the generated text is manually copied by the physician into the official record [22]. The head of the emergency department, Dr Patryk Konieczka, reported that the system saves approximately five hours of staff time across the department per day and that approximately half of the staff was using it within one month [24]. This figure is reportedly derived from a per-patient time saving of just over one minute per patient, multiplied by the emergency department's daily patients intake of approximately 280, rather than representing five hours saved per individual physician. Both this figure and the underlying per-patient calculation are based on the information reported in the media. They have not been verified by any independent or peer-reviewed source, and should be interpreted with caution, as no peer-reviewed outcome data have been published.

At the policy level, the Polish Ministry of Health and Centrum e-Zdrowia have articulated a digital transformation agenda identifying AI-supported documentation and modernisation of electronic medical documentation (EDM) as strategic priorities, partly funded through the National Recovery and Resilience Plan (KPO) [25]. The revised Polish Medical Code of Ethics (KEL), in force from 1 January 2025, introduces Article 12 provisions permitting physicians to use AI algorithms in diagnosis, treatment, or prevention. These provisions require that the patient is informed that AI will be used, that the patient's informed consent is obtained, that only certified AI algorithms approved for medical use are applied and that the physician retains the final diagnostic and therapeutic decision [26]. No formal survey data on Polish physician attitudes to ambient AI scribes have been identified, though broader surveys indicate Polish healthcare leaders are increasingly planning to automate administrative processes [27].

Potential benefits for Polish healthcare

Ambient AI scribes address documentation burden – one of the most consistently identified modifiable drivers of burnout – without the need to hire additional clinical staff. If ambient scribes save 60-90 min per physician per day, as the international evidence suggests is achievable [11,12], this time can be redirected to additional consultations, improved patient interaction or reduced working hours. Burnout prevalence has been shown to fall significantly after 30 days of ambient scribe use [16], and patients whose physicians used ambient scribes reported greater physician attentiveness [9].

Unlike human scribes, AI scribes require no employment contracts, office space, or increases in staff numbers proportional to patient volume – an important advantage given Poland's constrained National Health Fund (Narodowy Fundusz Zdrowia, NFZ) financing and structural physician shortage that cannot be resolved through recruitment or wage policy alone, amid sustained emigration [6]. Ambient AI scribes also align directly with the Ministry of Health's EDM modernisation programme and the AI priorities founded under the National Reconstruction Plan (KPO) [25].

TABLE 1. Potential advantages of ambient artificial intelligence (AI) scribes for the Polish healthcare system.

Potential advantage	Expected benefit*
Reduced documentation time	Automated note generation decreases time spent documenting consultations.
More direct physician–patient interaction	Less keyboard use improves eye contact, communication and patient-centred care.
Reduced physician burnout	Lower documentation burden and after-hours work may improve well-being.
Better utilisation of Poland's limited physician workforce	Time saved can be redirected to patient care, helping mitigate workforce shortages.
Standardised clinical documentation	Structured notes improve consistency and completeness, subject to physician review.
Patient trust and acceptance	Realised benefits depend on patient digital literacy and comfort with AI-assisted recording; the Poznań patient-notice incident illustrates the need for clear, proactive patient communication about data use.

*The expected benefits are based on international evidence reviewed in the manuscript and require confirmation in prospective Polish implementation studies. AI-generated documentation must always be reviewed and approved by the responsible physician.

Data safety, privacy and regulatory concerns

Voice recordings of clinical encounters constitute special categories of personal data under Article 9 of the GDPR. A Data Protection Impact Assessment (DPIA) is mandatory under GDPR Article 35, and any Polish hospital deploying an ambient scribe must consult its Data Protection Officer and, where a high residual risk persists, the Polish Personal Data Protection Office (UODO) in advance [28]. Voice data present specific re-identification risks: audio clips can be cross-referenced with other data sources, and medical transcripts often contain rare conditions or geographic details enabling indirect re-identification [28]. All commercial ambient scribes transmit audio or transcripts to third-party vendor systems, requiring Data Processing Agreements under GDPR Article 28; Polish hospitals must verify that vendor infrastructure is within the EU/EEA or that adequate transfer mechanisms are in place.

The ambient AI scribes in clinical practice are likely to be classified as high-risk AI systems under Annex III of the EU AI Act (Regulation (EU) 2024/1689), triggering obligations for conformity assessment, transparency, human oversight

and post-market monitoring. The 2025 Medical Device Coordination Group FAQ (MDCG 2025-6) confirmed dual compliance obligations for systems also qualifying as medical devices under the Medical Device Regulation (MDR, Regulation (EU) 2017/745) [29]. Polish hospitals are additionally subject to the second Network and Information Security Directive (NIS2, Directive (EU) 2022/2555) cybersecurity obligations. The Heidi Health architecture in Poznań,which involves processing audio in a separate network with no patient identifiers and deletion within six hours [22], illustrates a privacy-preserving model consistent with GDPR data minimisation principles (Article 5(1)(c)) that may serve as a starting point for early Polish deployments.

DISCUSSION

The international evidence base for ambient AI scribes has evolved from single-centre observational studies to randomised controlled trials within two years. The consistency of the study findings across documentation time, burnout prevalence and patient experience is notable, though most studies are short-duration and conducted in US or Dutch health systems. In the Polish context, three findings are particularly relevant. Firstly, while no independently peer-reviewed clinical evidence exists, Poland is not starting from zero: two parallel, independent strands of activity are already under way – the ADMEDVOICE project has produced validated Polish medical speech infrastructure, reported in publications authored by the consortium itself [19-21], and media reports from Poznań suggest exploratory real-world hospital use has begun, though the extent of deployment and clinical outcomes remain unverified in both cases. Secondly, the regulatory environment under GDPR and the EU AI Act is substantially more demanding than in the US settings where most evidence originates. Thirdly, the KEL Article 12 AI oversight obligation places an explicit ethical duty on Polish physicians that is independent of, but consistent with, the EU regulatory framework [26]. Automation bias may be particularly salient in this context: although the system ADMEDVOICE was fine-tuned to reduce the Whisper word error rate from 24.03% to 13.91% on Polish medical speech [19], this remains a substantial residual error rate, and regional accents and dialectal variation were not exhaustively represented in the underlying training corpus. Physicians reviewing structured notes generated from imperfectly transcribed speech may be less able to detect subtle errors embedded in fluent, clinically plausible text, particularly under the time pressure ambient scribes are intended to relieve. Early deployments within Poland should therefore treat clinical note review as an active verification step rather than a formality, with error rates ideally monitored by regional accent and specialty-specific terminology as adoption expands.

This review has several limitations. The evidence base is mainly based on studies conducted in the United States. Polish-language ASR data for ambient medical documentation are limited to the ADMEDVOICE publications. According to an email from the Director's Office of the Emergency Department (SOR) at the University Clinical Hospital in Poznań, the Heidi Health system had been in use for approximately one year at the time of the correspondence. The Director's Office indicated that, based on its experience at that time, the system had been performing well in practice, though no formal survey data on Polish physician attitudes were identified. Future systematic reviews with meta-analysis will be needed as the evidence base increases. The authors also acknowledge that the current evidence base is subject to publication bias, with positive findings more likely to be published and indexed. Studies reporting null results or implementation failures may be underrepresented, and the benefits summarised here should be interpreted with this in mind.

SUMMARY

Ambient AI scribes represent a potentially transformative innovation for Polish primary care. The international evidence, which now includes randomised controlled trial data, consistently demonstrates reductions in documentation burden and burnout, with high patient acceptance. The ADMEDVOICE project and the reported deployment in Poznań provide a nascent domestic foundation, while the Ministry of Health digital transformation agenda and the new KEL AI provisions create a broadly receptive policy environment.

Responsible deployment requires the validation of Polish-language ASR, GDPR-compliant consent processes, EU AI Act high-risk conformity assessment, integration with Polish EHR platforms and an institutional governance framework assigning clear physician accountability. Well-designed pilot studies in Polish primary care settings, addressing both clinical outcomes and regulatory compliance from the outset, are the essential next step.

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