



Developing a Dermatology-Specific Electronic Medical Record Leadership, Strategy, and the Role of Artificial Intelligence

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KEYWORDS

- Dermatology EHR • Clinical workflow • Physician leadership • Artificial intelligence
- Health technology • Specialty-specific systems

KEY POINTS

- Dermatology presents unique clinical, procedural, and longitudinal documentation challenges that are poorly served by generic electronic medical record systems.
- Physician-led design is essential for translating dermatologic workflows into useable, clinically meaningful digital platforms.
- Specialty-specific electronic medical records provide the foundation for meaningful integration of artificial intelligence in dermatology.
- Artificial intelligence in dermatology must be multimodal, specialty-aware, and embedded within structured clinical data to improve care quality while reducing physician burden.

INTRODUCTION

Electronic medical records (EHRs) have become ubiquitous in modern medicine, yet their promise of improved efficiency and care coordination remains unevenly realized. While many specialties have adapted—sometimes begrudgingly—to generalized EHR platforms, dermatology continues to experience a disproportionate mismatch between clinical workflow and EHR design. This mismatch is not merely an inconvenience; it has meaningful consequences for patient care, physician satisfaction, and the accuracy, consistency, and longitudinal usability of clinical data.

Dermatology is a high-volume, visually driven specialty that relies heavily on pattern recognition, longitudinal follow-up, and procedural documentation. A single patient encounter may involve the evaluation of multiple, diverse dermatologic conditions, including inflammatory dermatoses and

numerous lesions, each with distinct morphologies, anatomic locations, and management decisions. Dermatologic decision-making routinely integrates clinical photography, dermoscopy, dermatopathologic findings, and comparison across prior encounters. Generic EHR systems, largely designed for text-based documentation and problem-oriented medical encounters, are not optimized to support this level of visual and procedural complexity and may disrupt, rather than complement, dermatologic workflow.

As regulatory demands, documentation requirements, and administrative burdens continue to expand, dermatologists increasingly find themselves spending more time interacting with software rather than with patients. Burnout, now recognized as a systemic issue in medicine, is exacerbated when digital tools fail to align with clinical reality.¹ Addressing this challenge requires more than incremental optimization of existing systems;

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Abbreviations

- AI artificial intelligence
- UX user experience

it requires rethinking how EHRs are designed, led, and implemented within dermatology.

Moreover, as artificial intelligence (AI) becomes increasingly integrated into clinical medicine, the limitations of generalized EHR architectures extend beyond workflow inefficiency to the quality and structure of the data that will ultimately shape future diagnostic and decision-support tools.

IDENTIFYING THE GAP IN DERMATOLOGY EHRs

Documentation Complexity in Real-world Practice

Dermatology encounters are often highly information-dense. Unlike many specialties in which a visit may focus on a single problem over an extended period, dermatologists frequently address multiple, unrelated conditions across all age groups within a single, time-limited encounter—ranging from benign lesions and inflammatory dermatoses to premalignant and malignant neoplasms. Each condition may require a distinct assessment, procedural intervention, patient counseling, and individualized follow-up plan.

Generic EHRs typically force this complexity into linear, problem-based notes or free-text narratives. While flexible, free-text documentation undermines consistency, complicates retrieval of prior clinical data, and limits downstream usability. This limitation is particularly pronounced in dermatology, a specialty with a highly developed descriptive language and specialized terminology used to convey morphology, distribution, texture, and pattern. Dermatology encompasses thousands of distinct conditions, an extensive morphologic vocabulary, and highly granular anatomic descriptors, making purely narrative documentation difficult to standardize, retrieve, and analyze longitudinally—particularly in high-volume practices where documentation is frequently distributed across scribes or ancillary team members who may not share the same depth of dermatologic training. As a result, identifying how a specific lesion has evolved over time becomes challenging when prior descriptions are buried in narrative notes rather than captured as structured, searchable data.²

Coding Challenges: ICD-10 versus SNOMED-CT

The disconnect between clinical reasoning and billing systems is particularly evident in dermatology. Dermatologists conceptualize disease in

terms of morphology, distribution, and dermatopathologic correlation—elements that are well represented in clinical terminologies such as SNOMED-CT, a comprehensive, multilingual clinical health care terminology collection maintained by an international nonprofit standards development organization. In contrast, reimbursement and reporting rely on international classification of diseases, tenth revision (ICD-10) codes, which often lack the granularity necessary to fully capture dermatologic nuance.

Generic EHR platforms frequently require clinicians to select billing codes directly, thereby forcing the real-time translation of clinically intuitive documentation into complex, frequently revised administrative coding frameworks. Notably, some platforms marketed as dermatology-specific retain this same underlying architecture, resulting in similar documentation and coding inefficiencies despite specialty branding.

In high-volume dermatology practices, this documentation burden is often distributed across scribes or ancillary staff to maintain clinic throughput, a workflow that can introduce additional opportunities for transcription error or misalignment between clinical intent and recorded data. These inefficiencies may propagate downstream, increasing the risk of inaccurate coding, delayed billing, and data inconsistency. A dermatology-specific EHR can instead allow clinicians to document care using clinically meaningful terminology while automating the conversion to appropriate billing codes in the background, thereby preserving accuracy, efficiency, and data fidelity.

Procedures, Biopsies, and Body Mapping

Procedural care is central to dermatology. Biopsies, excisions, cryotherapy, photodynamic therapy, laser treatments, and cosmetic procedures are routine components of daily practice. Accurate documentation requires precise anatomic localization—often down to subcentimeter resolution—which is essential for both clinical decision-making and accurate procedural coding. Moreover, dermatologic care is inherently longitudinal; individual lesions are monitored over months or years, and even subtle changes—or misidentification of lesion location—may carry significant clinical implications.³

In addition to its clinical importance, precise anatomic localization is frequently required for accurate procedural coding. Many dermatologic current procedural terminology (CPT) codes are site-specific, such that the same procedure—such as a biopsy or excision—may be coded differently

depending on whether it is performed on the eyelid margin, cheek, ear, or other anatomically distinct regions. Imprecise documentation of lesion location, therefore, has downstream consequences for coding accuracy and administrative efficiency.

Electronic health records (EHR) systems employ varying approaches to anatomic documentation; however, 2 dimensional body mapping remains the most common. While sufficient for basic notation, 2 dimensional mapping introduces inherent limitations when applied to the 3 dimensional surface of the human body. Accurately documenting a single lesion may require multiple 2 dimensional views to approximate depth, curvature, and spatial relationships, increasing documentation burden and interuser variability.

An instructive analogy is navigation using multiple static paper maps to traverse long distances, compared with modern Global Positioning System-based systems that dynamically track precise location in 3 dimensional space. Similarly, 2 dimensional body maps often fail to preserve exact lesion location over time, limiting reliable lesion reidentification and accurate anatomic comparison during follow-up visits.

A 3 dimensional body mapping approach addresses these limitations by providing sufficient anatomic granularity to support efficient documentation at the point of care. When precise anatomic locations are selected directly within a 3 dimensional representation, biopsy and procedural details can be captured accurately during the encounter, enabling appropriate CPT code selection without reliance on post hoc interpretation of narrative descriptions. This integration reduces ambiguity, improves efficiency, and supports both clinical accuracy and downstream administrative workflows.

As a result, dermatologists are less reliant on external systems, scanned drawings, or disconnected imaging platforms to supplement documentation. Reducing this fragmentation helps preserve workflow continuity and enables the creation of cohesive longitudinal datasets essential for high-quality patient care, outcomes tracking, and future analytical and AI applications.⁴

PHYSICIAN-LED PRODUCT DEVELOPMENT

Why Dermatologists Must Lead Design

Many shortcomings of existing EHRs can be traced to their origins as systems designed primarily by technologists or administrators with limited exposure to daily clinical practice. In many cases, contemporary platforms are built on legacy architectures originally developed for other medical specialties, thereby constraining flexibility and

limiting their ability to accommodate the workflow-intensive demands unique to dermatology. Additional pressures to prioritize scalability, standardization, and financial performance—often driven by organizational or ownership structures—can further shift emphasis away from usability and clinician-centered design.

As a result, product development and implementation are frequently guided by individuals with deep technical or operational expertise but limited medical or dermatologic training. This structural disconnect helps explain why even systems marketed as dermatology-focused may continue to reproduce the same documentation, workflow, and usability challenges observed in generalized EHR platforms.

Dermatology-specific EHR development, and EHR design more broadly, therefore demands meaningful leadership from dermatologists who understand not only what must be documented but also how clinicians think, prioritize, and make real-time decisions in high-volume clinical environments. Physician-led design ensures that software supports clinical reasoning rather than obstructing it. Dermatologists are uniquely positioned to determine which data elements are essential, which are redundant, and which workflows must remain flexible—insight that cannot be fully captured through focus groups or post hoc feedback, but instead requires direct and sustained clinical involvement.

Translating Clinical Workflow into Software Logic

Effective EHR design requires abstraction—the distillation of complex clinical processes into structured, repeatable workflows without oversimplifying them. For example, documenting a skin lesion involves capturing morphology, color, size, anatomic location, differential diagnosis, and management plan. Structuring these elements enables consistency, data reuse, and longitudinal comparison while preserving clinical nuance.

Physician-led teams are uniquely positioned to guide this translation. They can ensure that structured data entry aligns naturally with clinical thought processes rather than feeling imposed or artificial, reflecting how dermatologists examine patients and reason through skin disease in real time.

Avoiding Feature Bloat

A common failure mode in health technology is feature bloat—the accumulation of infrequently used tools that clutter interfaces, slow performance, and increase cognitive load. Physician leaders are often more disciplined in resisting

unnecessary complexity, prioritizing usability, speed, and clarity over exhaustive functionality.

In dermatology, where patient volume is high and visit time is limited, a streamlined design is not merely a convenience but a prerequisite for safe and efficient care delivery. Thoughtful feature selection ensures that technology enhances, rather than hinders, clinical workflow.

STRATEGIC DECISIONS IN BUILDING A DERMATOLOGY-SPECIFIC EHR

Specialty Focus versus Horizontal Platforms

A foundational strategic decision in EHR development is whether to pursue a horizontal platform designed to serve multiple medical specialties or a specialty-specific system optimized for a single domain. Horizontal EHR platforms offer advantages in scale, interoperability, and enterprise deployment, particularly within large health systems. However, these benefits are often achieved by prioritizing standardization over depth, resulting in workflows that reflect linear, problem-oriented documentation models common to many medical specialties, rather than the multidimensional, procedure-intensive, and visually driven workflows characteristic of dermatology.

Dermatology-specific EHRs adopt a fundamentally different strategic posture. Rather than attempting to accommodate all specialties equally, they prioritize depth within a single domain, enabling tighter alignment with dermatologic workflows. This includes native support for image-centric documentation, lesion-level tracking, precise anatomic localization, procedure-heavy encounters, and longitudinal follow-up. While horizontal platforms may approximate these capabilities through layered customization, such adaptations are frequently constrained by underlying architectures that were not designed for dermatology. As a result, customization on top of general-purpose systems rarely achieves the coherence, efficiency, or usability of purpose-built solutions.

From a strategic perspective, specialization represents a deliberate focus. In dermatology, where clinical nuance and efficiency are paramount, depth often delivers greater value than broad applicability.

Customization versus Standardization

Another central strategic tension in EHR development is the balance between customization and standardization. Excessive customization can undermine scalability, complicate maintenance, and impair interoperability, while rigid standardization may fail to accommodate the variability inherent in real-world clinical practice.

An effective approach to dermatology-specific EHR design resolves this tension by standardizing data structures rather than clinical workflows. Core clinical elements—such as lesion morphology, anatomic location, diagnosis, procedure type, and outcome—are captured in consistent, structured formats that support mapping to standardized clinical terminologies, such as systematized nomenclature of medicine clinical terms (SNOMED-CT), thereby enabling reporting, analytics, and interoperability. At the same time, clinicians retain flexibility in how they document encounters, sequence tasks, and adapt workflows to individual practice styles.

This approach preserves structured data while allowing flexibility in clinical workflows and ensuring that documentation remains useable for longitudinal care and downstream applications, such as AI.

User Experience as a Strategic Asset

User experience (UX) is often treated as a secondary consideration in health care technology, yet it plays a central role in adoption, satisfaction, and long-term viability. In dermatology, where encounters are time-limited and cognitively dense, UX is not merely a design preference but a strategic asset—particularly in environments in which documentation and workflow tasks are shared among physicians, scribes, medical assistants, and other ancillary staff.

Efficient navigation, rapid image access, minimal clicks, and intuitive data entry directly affect clinical throughput and cognitive load. Poor UX increases documentation time, fragments attention, and contributes to burnout, especially when interfaces are difficult to learn or inconsistent across user roles. Conversely, systems that align naturally with dermatologic workflows enable both clinicians and ancillary team members to perform tasks accurately and efficiently, allowing physicians to focus on patient care rather than interface management.

Strategically, investment in UX yields compounding returns. Intuitive platforms for all members of the dermatology team become embedded in daily practice, fostering adoption, consistency, and reduced attrition. In a competitive EHR market, usability across diverse user roles becomes a key differentiator, often outweighing feature breadth or technical sophistication.

Interoperability, Compliance, and Scalability

Specialty-specific focus does not obviate interoperability. Dermatology EHRs must integrate seamlessly with pathology laboratories, imaging systems, referral networks, and health information

exchanges. Regulatory requirements related to privacy, security, and data sharing must also be addressed proactively.

The strategic challenge lies in achieving interoperability without sacrificing usability. Overly burdensome compliance layers can erode workflow efficiency, while insufficient integration can isolate practices and limit continuity of care. Thoughtful system design ensures that regulatory and interoperability requirements are met in ways that are largely invisible to clinicians, preserving efficiency while maintaining compliance.

Scalability presents a parallel challenge. As practices grow or integrate into larger systems, EHR platforms must support increased volume, additional users, and evolving regulatory demands without degrading performance or usability. Strategic leadership is required to ensure that growth does not dilute specialty focus or compromise the clinician experience.

Strategic Alignment with Practice Operations

Finally, the EHR strategy must align with the operational realities of dermatology practice. High patient volume, procedure-heavy encounters, and precise coding requirements place unique demands on both clinical and administrative workflows. Systems that separate clinical documentation from practice management functions often introduce inefficiencies, errors, and redundant data entry.

Strategically integrated platforms—those that align clinical documentation, coding logic, and operational workflows—enable practices to function more efficiently while preserving clinical accuracy. This alignment supports not only day-to-day operations but also long-term sustainability in an increasingly complex health care environment.

Strategic Implications

Taken together, these strategic decisions—specialty focus, data standardization, UX prioritization, interoperability, and operational alignment—define the success or failure of dermatology-specific EHR platforms. Leadership that recognizes and navigates these trade-offs deliberately is essential to the design of systems that serve both clinicians and patients effectively.

BRANDING AND MARKET ADOPTION

The EHR marketplace is highly saturated, with many platforms competing on feature breadth, enterprise reach, or compliance credentials. In such an environment, differentiation based solely on technical capability is increasingly difficult. For dermatology-specific platforms, meaningful differentiation arises

from depth rather than breadth—specifically, from the ability to support the specialty's unique clinical, procedural, and documentation demands.

Workflow alignment represents a primary differentiator. Platforms that reduce friction, minimize redundant data entry, and support efficient navigation during time-limited encounters offer tangible value to clinicians. Similarly, native support for dermatologic imaging, anatomic precision, and longitudinal lesion tracking distinguishes specialty-focused systems from generalized alternatives.

Equally important is the ability to articulate these advantages clearly and honestly. Effective market adoption depends on transparent communication that sets realistic expectations and emphasizes clinical relevance over marketing claims. Overpromising efficiency gains or underestimating implementation complexity can erode trust and hinder adoption, particularly in a specialty that values precision and pragmatism.

Scaling While Preserving Identity

Growth presents a distinct challenge for specialty-specific EHR platforms. As adoption increases, pressures often emerge to generalize functionality, broaden target markets, or standardize workflows to accommodate diverse practice settings. While such strategies may facilitate scale, they risk diluting the very characteristics that initially differentiated the platform.

Successful dermatology-specific platforms resist this tendency by preserving their core identity even as they expand. This includes maintaining a focus on dermatologic workflows, protecting usability gains achieved through specialty alignment, and avoiding design compromises that prioritize universality over relevance. Strategic scaling entails expanding capacity and interoperability without compromising the principles that made the platform effective for its primary users.

Preserving a specialty's identity also supports its long-term relevance. As health care technology continues to evolve, platforms that remain anchored in the needs of their core clinical audience are better positioned to adapt thoughtfully to new requirements, including regulatory changes and emerging technologies such as AI. Branding, trust, and adoption are tightly interwoven, shaping both initial uptake and sustained engagement.

Strategic Implications

Taken together, branding and market adoption in dermatology EHRs are driven less by traditional marketing strategies than by sustained clinical alignment. Trust, differentiation, and scalability emerge from a shared foundation: respect for the

specialty's complexity and a commitment to supporting dermatologists in delivering high-quality care. Platforms that recognize branding as an extension of clinical philosophy—rather than a separate commercial exercise—are more likely to achieve sustained adoption in a crowded and rapidly evolving marketplace.

Implementation and Sustained Engagement

Adoption is also influenced by implementation experience. Platforms that minimize training burden, reduce disruption during onboarding, and align early with established workflows are more likely to sustain adoption. In dermatology practices—where efficiency and throughput are closely linked to financial sustainability, and institutional factors often drive adoption decisions—usability plays a critical role in long-term clinician engagement and retention.

ARTIFICIAL INTELLIGENCE IN DERMATOLOGY EHRs

Why Artificial Intelligence Must Be Specialty-aware

AI has shown promise across medicine, yet many currently deployed AI tools remain narrow and task-specific, often optimized for isolated use cases such as documentation assistance or single-image classification rather than clinical reasoning. Dermatology, by contrast, requires AI systems capable of integrating multiple data modalities—including clinical photographs, dermoscopy, dermatopathology, total-body photography, and longitudinal clinical data—within real-world workflows. Early research demonstrated the feasibility of AI-assisted differential diagnosis using clinical images alone.⁵

Recent peer-reviewed study provides compelling evidence that specialty-specific, multimodal AI architectures are better suited to these demands. In a large *Nature Medicine* study, Ge and colleagues⁶ introduced a multimodal dermatology foundation model trained on more than 2 million real-world dermatologic images spanning 4 imaging modalities and multiple international institutions. The model was evaluated across diverse clinical benchmarks, including melanoma screening, differential diagnosis, lesion segmentation, longitudinal change detection, and risk stratification. Across these tasks, it consistently outperformed generalist and unimodal AI systems.

Importantly, the model demonstrated particular strength in tasks that mirror routine dermatologic practice, including longitudinal lesion monitoring, total-body photography-based risk stratification, and early melanoma detection. In reader studies,

the use of the model improved clinicians' diagnostic accuracy in skin cancer assessment and enhanced differential diagnosis across a broad range of inflammatory and neoplastic conditions, with especially pronounced benefits among nonspecialist providers. Collectively, these findings underscore a critical principle: AI systems trained on dermatology-specific, multimodal, and longitudinal data are better aligned with the realities of clinical dermatology than generalist models adapted post hoc.

From Free Text to Structured Clinical Intelligence

The performance gains observed in multimodal dermatology-specific AI systems are inseparable from the quality and structure of the data on which they are trained. Free-text documentation, while flexible and expressive, limits machine interpretability, reuse, and longitudinal analysis. In contrast, structured capture of key dermatologic elements—such as lesion morphology, anatomic location, diagnostic category, procedural details, and outcomes—enables AI systems to learn clinically meaningful representations that generalize across tasks.

Dermatology-specific EHRs play a foundational role in this process. By capturing clinical data in structured formats aligned with dermatologic workflows, these systems create datasets that support not only documentation and billing but also advanced analytics and AI-driven insights. The ability to link multimodal images with precise anatomic localization and longitudinal follow-up is particularly critical for tasks such as lesion change detection, risk stratification, and outcome prediction—capabilities highlighted as strengths in recent multimodal foundation models.⁶

Limitations of Documentation-centered Artificial Intelligence

Much of the current clinical adoption of AI has focused on documentation assistance, including AI-based scribing and automated note generation. While these tools are relatively straightforward to implement and may offer incremental efficiency gains, they primarily operate on unstructured narrative text and do not fundamentally alter how clinical data are captured, organized, or reused.

In dermatology, where diagnostic reasoning depends on visual patterns, anatomic precision, and longitudinal change, documentation-centered AI addresses only a small fraction of the specialty's informational complexity. As a result, AI implementations limited to documentation support are insufficient to realize the broader clinical value of

AI in dermatology, which depends on structured, multimodal, and spatially precise data captured at the point of care.

Artificial Intelligence as a Clinical Partner

The goal of AI in dermatology is augmentation rather than replacement.⁷ AI systems are most valuable when they support clinicians' strengths—such as pattern recognition and synthesis of complex information—while reducing cognitive load and administrative burden. In reader studies, dermatology-specific AI assistance improved diagnostic accuracy and confidence without supplanting clinician judgment, illustrating a collaborative model in which clinicians retain decision-making authority while benefiting from computational support.

Crucially, effective AI must be embedded within existing clinical workflows rather than introduced as a parallel system. AI tools that require separate interfaces, duplicate data entry, or post hoc analysis risk adding friction rather than reducing it. Integration within the EHR—where clinical data, images, and longitudinal context already reside—allows AI insights to surface at the point of care, when they are most actionable.

Reducing Burnout through Thoughtful Integration

When implemented thoughtfully, AI has the potential to reduce documentation burden, streamline workflows, and mitigate burnout. However, poorly designed AI—particularly systems that generate excessive alerts, provide opaque recommendations, or impose additional data-entry requirements—may exacerbate clinician fatigue. The distinction lies not in the presence of AI, but in how it is designed, governed, and integrated.

Leadership is, therefore, essential to ensure that AI serves clinicians rather than administrative metrics. Specialty-aware EHRs that prioritize structured data capture, workflow alignment, and clinician oversight provide the necessary substrate for AI systems that enhance care without undermining professional autonomy.

LEADERSHIP CHALLENGES AND LESSONS LEARNED

Managing Growth and Complexity

Developing and sustaining a dermatology-specific EHR requires navigating technical, regulatory, and organizational complexity. Growth must be managed deliberately to avoid compromising usability or trust.

Balancing Clinical Practice and Innovation

Physician leaders often straddle clinical practice and technology development. Maintaining clinical involvement ensures relevance but requires disciplined prioritization and delegation.

Ethical and Regulatory Responsibility

As EHRs and AI systems increasingly influence clinical decisions, ethical considerations become paramount. Transparency, data privacy, and clinician oversight must guide innovation.

FUTURE DIRECTIONS AND IMPLICATIONS

The future of dermatology EHRs lies in deeper integration of structured data, multimodal imaging, and AI. These systems will increasingly support not only documentation but also clinical decision-making, research, and population health initiatives.

Implications for Training, Research, and Health Systems

Dermatology-specific EHRs may play a growing role in education and research, enabling residents to learn from structured case libraries and supporting large-scale outcomes analysis. Health systems that invest in specialty-aware platforms may gain advantages in quality, efficiency, and innovation.

SUMMARY

Dermatology's unique demands require digital tools designed specifically for the specialty. Physician-led development of dermatology-specific EHRs addresses long-standing gaps in workflow, documentation, and data quality. As AI advances, these platforms will serve as the foundation for meaningful innovation. Leadership, vision, and specialty focus will determine how effectively dermatology navigates the digital future.

CLINICS CARE POINTS

Pearls

- Specialty-specific EHRs align more closely with dermatologic workflows, improving efficiency and accuracy.
- Physician leadership is essential for designing clinically meaningful digital systems.
- AI is most effective when built on structured, specialty-specific data.

Pitfalls

- Overgeneralized EHR platforms increase documentation burden and limit the utility of data.

- Poorly integrated AI tools may worsen burnout rather than alleviate it.
- Treating AI primarily as a scribe, administrative, or billing tool risks undermining its broader clinical potential.

DISCLOSURE

S. Prodanovich reports a financial interest as the founder and creator of EZDERM, LLC.

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