

# Electronic Medical Records in Dermatology: The Good, the Bad, and the Ugly

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The American Recovery and Reinvestment Act of 2009 introduced the Health Information Technology for Economic and Clinical Health (HITECH) Act and allocated \$19.2 billion to promote the implementation of an electronic medical record (EMR) by hospitals as well as physicians in private practices.<sup>1</sup> The EMR stores longitudinal health information and constructs a comprehensive picture of a patient's medical history.<sup>2,3</sup> Following its debut, the US Department of Health & Human Services set forth meaningful use (MU) criteria,<sup>1</sup> which aimed to increase quality of care, safety, and efficiency. Meaningful use criteria also sought to decrease health disparities; improve coordination of care; engage patients in their care; refine population and public health measures; and finally ensure accessibility, privacy, and security of patient data.<sup>1,2</sup>

The EMR offers potential gains at multiple levels of the patient–physician–public health hierarchy: a decrease in medical errors and duplicate services, timely access to test results and records, timely notification of patients in need for preventive services, and preservation of medical records in the event of an environmental disaster.<sup>1–3</sup> Furthermore, physicians can take advantage of informational reciprocity with other providers, gain remote access to medical records, be reminded of need for service, e-prescribe, monitor for drug interactions, and utilize clinical information for research purposes.<sup>1,3</sup> Lastly, public health organizations can use EMRs to improve outcomes by employing surveillance measures and creating patient registries that serve to protect the society at large.<sup>1</sup>

Although it seems that the broad-scale implementation of EMRs will undoubtedly enhance the quality of patient care in the years to come, many obstacles must be overcome to reach this potential. Certification of EMR systems and implementation of confidentiality measures

that are compatible with the Health Insurance Portability and Accountability Act are the forerunning concerns, and the interconnectivity of EMR systems becomes more important as MU enters its later stages (eg, increased electronic transmission of patient data during phases of care, reliance on e-prescribing, population-level analysis of patient data to improve health outcomes). Additionally, the cost to implement and maintain an EMR deters many physicians in smaller practices from shouldering the charges, as they do not necessarily see increased productivity with this technology.<sup>2</sup> Last but not least, unintended consequences of EMR implementation can involve the dangers of upcoding and overdocumentation.<sup>1</sup>

Dermatology is a visually dominant field serving a high volume of patients that require both medical and surgical care. These factors do not preclude the implementation of EMRs in our specialty but rather necessitate the utilization of a system specifically designed to cater to the needs of specialists in dermatology. This editorial will address some fundamental considerations in implementing an EMR in dermatology; discuss what platforms and patient interfaces are most practical; reiterate the importance of interoperability; and highlight the implications of this powerful tool in education, research, training, and monitoring quality of care.

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## Implementation and Specific Considerations in Dermatology

One of the biggest areas of concern in adopting an EMR is the associated financial burden.<sup>2-5</sup> Although government incentives of MU cover a part of the initial cost of purchasing an EMR, expert maintenance costs, changes in workflow dynamics, and a steep learning curve can translate into lost productivity and revenue, discouraging many dermatologists from implementing an EMR.<sup>3,5</sup> Furthermore, physicians who are nearing the end of their careers may not realize the longer-term benefits of implementing an EMR and therefore may decline to do so despite the disincentives of lower Medicare reimbursements.<sup>2</sup> In fact, when juxtaposing the upfront cost of implementing an EMR against the expected increase in revenue after its implementation, there are general concerns that there will be a net loss on the part of the provider, which is a barrier to adoption of EMRs.<sup>3</sup>

Beyond the cost-benefit analysis, dermatologists often report multiple lesions in different anatomic sites or identify multiple biopsy sites that have been conveniently recorded on body templates included in their paper-based examination forms. Converting that information into words to be entered into an EMR can be excruciatingly time consuming and not easily comprehensible upon follow-up visits with the patient, which again results in decreased efficiency and productivity.<sup>4</sup> Therefore, selecting a dermatology-compatible EMR that aims to make this transition easier is of utmost importance. One developer introduced an EMR with a touch interface containing a human body in all its facets that can be rotated, zoomed, and marked multiple times for accurate and convenient recording of lesions and intended procedure sites. This system automatically produces codes for examinations and procedures; facilitates e-prescription and ordering of laboratory results; prints pathology requests and consent forms; and includes information for patient education regarding their care. For example, the physical examination section of an H&P (history and physical examination) can be generated with a few taps on the screen, translating into increased efficiency and productivity.

The visual nature of dermatology demands the use of images, and as such, photographs have become integral in the diagnosis and follow-up of dermatology patients. Digital and dermatoscopic images not only help to eliminate unnecessary biopsies but also can promote early detection and management of malignancies.<sup>6</sup> Thus, the capability to link photographs to a patient's medical record using an EMR is an invaluable gain. However, employing this feature in clinical practice has ethical implications that must be addressed, given that taking photographs can evoke an avoidable fear in patients regarding unlawful dissemination or unnecessary exposure of these images to physicians who do not need to access them.<sup>6</sup> Thus, guidelines must be set for uploading, de-identifying, and annotating patient photographs, and

only physicians involved in the care of the patient should be allocated access.<sup>4,6</sup>

## EMR Platforms

When computers were first introduced into examination rooms, many physicians were reluctant, as computers were thought to disconnect physicians from patients, arousing a sense of remoteness and further depersonalizing the encounter as physicians spent more time typing and less time making meaningful eye contact with patients.<sup>5</sup> The practice of dermatology requires patient-centered communication that serves to enhance the quality of care while at the same time allowing physicians to fulfill professional competencies and reduce medical errors, which may ultimately translate into patient satisfaction.<sup>7</sup> In fact, when the patient-physician relationship is interrupted, patients are more likely to pursue legal action in the wake of a bad treatment outcome.<sup>5</sup>

Employing a tablet-friendly EMR can help circumvent (or at least minimize) this problem by providing the physician with a light, user-friendly device that eliminates the need for laptops or desktop computers.<sup>4</sup> Going one step further, the utilization of tablets eliminates the need for accessory digital cameras, as most tablets come with built-in high-resolution cameras for capturing clinical photographs and immediately linking them to the patient's medical record. Lastly, tablet technology allows physicians to access consent forms while in the examination room with the patient to more readily obtain a signature for procedural or research consent.<sup>4,8</sup>

## Interoperability, MU, and Quality of Care

The real goal in nationwide implementation of EMR technology is to accomplish MU criteria. Different EMRs should not only allow data to be imported and exported but ideally should be compatible and interoperable with one another.<sup>2</sup> The myriad of different EMR platforms available impedes maximal functionality as MU moves into its final stage. For example, if an academic dermatology program in the setting of a larger hospital is required to use the generic hospital EMR, the dermatologist's specific needs may not be effectively met; on the other hand, if a dermatology-specific EMR is implemented, access to the hospital's larger database of patient information may be sacrificed. Optimal EMR systems should be designed to allow specificity for a given specialty while being able to receive and integrate laboratory values, dermatopathology and radiology results, and notes from consultations by other physicians. Such integration may reduce duplicate services, increase patient satisfaction, and fulfill MU criteria. In fact, the fear of many physicians, especially those in a field such as dermatology, are the unwanted costs that come with implementation of an EMR system that will soon become impractical due to compatibility issues.<sup>2</sup> As a result, until a system that can meet the needs of multiple specialties is developed, dermatologists and other physicians upgrading to an EMR should consider

implementing a system that is compatible with nearby hospitals, other specialists' offices, and diagnostic centers to maximize interoperability at the local level.<sup>2,3</sup>

Electronic medical record systems that interoperate also provide the ability to set forth performance measures for physicians aimed at improving quality of care. As our health care system moves toward a pay-for-performance model, EMRs will become a tool to determine if standards of care have been met, unnecessary diagnostic tests have been avoided, and unwanted outcomes have been minimized. These measures will usher in a new era of medicine in which physicians strive to improve the care provided to their patients and receive increases in their reimbursements, while patient outcomes and satisfaction are improved.<sup>9</sup>

### Academics, Education, Research, and Residency

The practicality of EMRs in dermatology may best be appreciated in academic settings. Electronic medical records serve as a repository of coded information that is neatly organized and can be rapidly searched, allowing for use as a powerful research tool. As an example, physicians can use EMR systems to identify patients with specific qualifications and study outcome variables over time.<sup>2,3</sup> Additionally, with the rise of interoperable systems, we can expect a new dawn in medical research as more information becomes available to clinical investigators, opening doors to endless possibilities for evidence-based care.<sup>2,3,8</sup>

Another advantage of EMRs is their utility in residency programs that are charged with the task of ensuring resident competency via exposure to a comprehensive host of clinical encounters. An EMR system uniquely allows residents and attending dermatologists to monitor adequate exposure to general, pediatric, complex medical, procedural, and dermatopathologic cases, and to track the number of procedures performed by the residents by directly linking the information into the Accreditation Council for Graduate Medical Education procedure log.

Furthermore, due to the dominance of digital and dermatoscopic images in the field, interoperable EMRs could be used to construct a database of clinical and dermatopathologic specimens that not only can be used in educating residents but also may serve as a powerful reference tool in the diagnosis of complex and rare cases.<sup>8</sup> Another often unrecognized advantage of EMRs is their utility in teledermatology. With the interoperable EMRs within academic institutions, teledermatology can be used locally and nationally for rapid consultation with high diagnostic validity,<sup>10</sup> which has the burgeoning potential of providing patients with quicker time to

diagnosis considering the dermatologist shortage in various parts of the country.

Lastly, the implementation of EMRs in residency programs has the additional benefit of exposing residents and medical students to emerging technology early on in their careers and fosters a degree of familiarity and comfort that may lead to implementation of EMRs in their future practices.<sup>2</sup> For dermatologists in-training, early exposure to these technologies also may serve as a way to develop an interactive interview style and adapt to the presence of EMRs in examination rooms without sacrificing quality of care and meaningful patient interaction.<sup>7</sup>

### Conclusion

Electronic medical records are already becoming an integral part of many hospitals and private dermatology practices. Although EMRs provide potential benefits that can be expected to ultimately outweigh the associated costs in larger settings such as hospitals, residency programs, and multidisciplinary practices, EMRs may not be immediately beneficial to physicians in private practices or those approaching the end of their careers. Although a perfect system may be unattainable, development of interoperable systems designed to meet the needs of specialties such as dermatology are essential in attaining a comprehensive patient medical profile, improving quality of care, minimizing costs, reducing medical errors, and maximizing patient satisfaction.

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