

*Safe and effective family medicine practice relies on clinical information stored in electronic health records and other health information technology (HIT). However, past HIT iterations have failed to deliver their predicted benefits. Instead, they have introduced significant patient safety errors and impediments to physician workflows. Family medicine has a critical influence to correct the role and purpose of HIT, especially in the approaching era of artificial intelligence (AI) for healthcare.*

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Since 2009, the HITECH act has underwritten \$36 billion to healthcare institutions and clinicians to adopt and “meaningfully” use electronic health records. At the time that act was passed, bipartisan opinion believed HIT would decrease medical errors, lower healthcare costs, and aggregate patient data for medical research objectives. Ten years later, these expectations have not been met. On the contrary, evidence exists that HIT 1) introduces new types of error (“e-iatrogenesis”), 2) increases the expenses of unnecessary medical testing through computerized physician order entry (CPOE), and 3) impedes research by isolating clinical data behind HIT vendor and institutional barriers. Finally, there is strong evidence that HIT contributes to clinician burnout, which has become epidemic.

Family medicine, which enjoys special satisfaction from developing long-term patient-physician relationships, has perhaps suffered more from the encroachment of HIT documentation into patient encounters than other specialties. It has been subjected to HIT designed primarily for billing and administration rather than physician and patient-centered care. For example, a recent JAMA article criticized “bloating” electronic notes with review-of-systems data that auto-populate to satisfy institutional billing expectations.

Despite no clear resolution to these problems, sentiment favoring new iterations of HIT systems is strong. Today, excitement to employ artificial intelligence (AI) in HIT recalls the enthused climate surrounding HIT adoption in 2009. Governmental and medical professional organizations, including the National Institutes of Health (NIH), the American College of Radiology (ACR), and the American Medical Association (AMA) have recently stated their goals for AI integration in healthcare delivery in the coming decades. At the same time, technological advancements in AI for healthcare are not pioneered by physician agencies such as these, but by scientists and engineers at technology giants (e.g. Google’s DeepMind). If AI-HIT design and deployment are not direct by clinicians, then patient safety and physician needs may remain marginalized. This is an unacceptable future for our healthcare system.

At this juncture, the importance of family medicine to the future of patient and physician-oriented HIT is elevated for several reasons:

1. Family medicine physicians are stewards of the clinical data needed to train and scale artificial intelligence. Building precise AI depends on data volume; family medicine documents millions of patient encounters every year. Building accurate AI depends data correctness and appropriate context; family medicine physicians are the key to data quality because they are responsible for its documentation. Representation of true prevalences of health and disease states in training data is critical because AI learning is statistical; family medicine sees high demographic diversity, disease variety, and the best assortment of both disease and health. In addition, family medicine

is a gatekeeper to subspecialty referrals and thus to subspecialty data. For these reasons, family medicine controls the single richest source of clinical data needed to scale AI-driven HIT. Family medicine wields enormous influence on the future of AI-driven HIT and should leverage this to negotiate and inform its implementation.

2. AI will likely empower family medicine to administer specific tasks that today are referred for specialty care. The term “augmented intelligence” (which the AMA prefers to artificial intelligence) emphasizes this physician-AI synergistic vision. Augmented intelligence may expand the domain of family practice. For example, AI algorithms have been developed that can discriminate benign nevi from melanomas with the accuracy of dermatologists, detect early diabetic retinopathy on retinoscopy with the accuracy of ophthalmologists, and detect early-stage lung cancer on screening low-dose CT scans better than radiologists. Such algorithms can be packaged in software applications and deployed in tandem with family medicine physician judgment. They could be especially useful in medically underserved locations where family medicine physicians now serve as specialists.

3. Family medicine must continue to help patients navigate illness with humanism that AI cannot duplicate. To paraphrase a recent commentary published by a primary care physician, even if AI “outmemorizes the brightest mind,” it cannot provide the compassion of an attendant physician.

Although the adoption of HIT over the past decade has failed to bring its intended benefits, physician leadership may steer our healthcare system away from repeating these failures in the era of AI. Family medicine is best situated to champion HIT reformation that ensures patient safety and combats physician burnout. The influence of family practice will increase with AI-HIT integration because the volume, variety, and quality of family medicine clinical data are ideal for training AI. Moreover, family medicine providers equipped with AI tools may soon staff medical needs that would otherwise require a specialist.