

Electronic Health Records: Agenda-Based Medicine

Hermann W. Børg, M.D.

Traditionally, the medical record has served to describe a person's medical experiences. It may span a lifetime, and includes narratives of illnesses and operations, as well as a cumulative list of the illnesses, operations, and any traumatic episodes; medications; allergies; habits such as smoking and alcohol use; inherited conditions, and so on. The medical record is fundamental to medical care. In order to keep records of the medical events in a person's life, to furnish an aid to memory and communication among physicians, nurses, and ancillary medical personnel, the medical record holds the premier position in the practice of medicine.

Beginning in the mid-1960s, when the federal government and commercial pre-paid medical "plans" began interposing themselves between the patient and physician, the medical record has been transmogrified into an instrument primarily for the convenience of those entities, heretofore foreign to medical practice. This is supposed to serve "health care reform," which actually means "medical care payment system change."

Payment for medical care used to be direct, from a patient to a physician or hospital, the way payment for veterinary medical care still operates. Now payment generally is made by an insurance company. However, what is currently termed "insurance" in the medical sphere is now mostly a "pre-paid plan." Insurance was invented to compensate people for unforeseen large losses, such as a house fire, or an automobile crash, or a fractured skull. Homeowner's insurance does not cover painting the bathroom, or a new doorknob. Auto insurance does not cover oil changes or new tires. But what is incorrectly termed "health insurance" often covers every cut and snuffle. That is true of Medicaid and Medicare, and it has been responsible for the huge increasing costs of those programs. It is also true of many employer-sponsored "health plans," which came into being during World War II as a way to get around wage controls by giving people money for medical problems instead of offering higher wages and salaries.

More recently, the success of information technology (IT) in various industries provided an impetus for using this technology to make it easier for government and commercial plan administrators to analyze the medical record for the purpose of determining what minimum payment was owed under any given "plan."¹ Consequently, the medical record gradually has been transformed from a record for the benefit of the patient and the patient's physicians and nurses into a digital data set for the benefit of third-party payers.² The stated purpose of that process was to miraculously

deliver significant improvement in the quality of care plus substantial cost cutting. The digital transition has proven, however, to be unexpectedly troublesome, slow, and riddled with serious problems.^{3,4}

Physicians and patients have a vested interest in the medical record, computerized or on paper. Government programs and commercial companies selling "health plans" have interests vested in electronic health records or EHRs. Those entities have agendas incongruent with patients' interests. Moreover, there is an enormous discrepancy in administrative and regulatory power between individual patients and their physicians and nurses, and the third-party government and commercial entities that have become the major beneficiaries of the EHR. The primary users of the EHR, which has been imposed upon them incrementally, are the front-line physicians and nurses who rely so much on the medical record in their work. They know the frustration of EHR software foisted on them, which sounded great in theory but is atrocious in practice. The primary beneficiaries of EHRs are those other than patients, physicians, and nurses, who derive benefits from IT, without being exposed to its aggravating, annoying, alarming, and troublesome inconvenience. Physicians, who actually use these EHRs, developed without physician advice or consultation, by people with no understanding of medical practice, complain about the problems caused by EHRs. Nevertheless, government and commercial "medical plan" companies continue to push for rapid, coerced, and universal EHR adoption.

One of the most effective public relations strategies for promoting any self-serving policy is to disguise it as a measure aimed to benefit the public. Consequently, the government and commercial beneficiaries of the EHR broadcast the alleged improvement of "health care quality" by EHR use, and not on how it benefits them at the expense of the patient's clear, concise medical record. Such claims are purely conjectural, and inconsistent with complaints and feedback from physicians and with research studies.^{3,5,6} Unfortunately, government and corporate EHR beneficiaries are those with regulatory power. Government and corporations have mandated and coerced use of proprietary EHRs by using or misusing their powers, imposing regulations and penalties, and offering bribes (usually called "incentives").⁷ By these methods, physicians are being coerced into using flawed EHR systems.^{1,3,4} Moreover, it must be recognized that EHRs are an experiment presented by the industry as proven medical technology. Unlike for any other "medical device," marketplace surveillance of EHRs

was never done. No informed consent for its use is required. Those are extraordinary regulatory accommodations for an experimental technology.

As the gulf between optimistic projections and the disappointing reality of mandated EHRs became blindingly obvious, physicians expressed their discontent. Critical voices include those in mainstream media publications,⁸ statements by medical societies (including AMA⁹ and AAPS¹⁰), articles from Internet resources for physicians such as Medscape,¹¹ and commentaries by individual physicians.¹² Moreover, the scientific community delivered original research studies,^{3,5} meta-analyses,⁶ and editorials⁴ describing many problems with EHRs. Most of those publications focused on specific narrow aspects of EHR imposition. The purpose of this commentary is to give readers a more holistic perspective on the EHR conundrum. Journalists and science educators, when reporting on an especially convoluted subject, have used a proven analytical method: *Quid?* (What?), *Quis?* (Who?), *Cur?* (Why?), *Quando?* (When?), *Ubi?* (Where?)^{13,14} Since the answers to two of those questions are obvious (when is now, and where is in the U.S. and worldwide), here we examine the remaining three elements of the canon: *Quid?* What are EHRs? *Quis?* Who promotes, and who opposes them? *Cur?* Why is this all happening?

The Nomenclature of EHRs

The terminology used in applying information technology to medical records is confusing. Therefore, we will define first the most common terms associated with EHRs:

- **Electronic health record** is a term used to denote a cross-institutional longitudinal collection of a patient's health information, entered or transcribed electronically.¹⁵ [The health information itself is data and not electronic.]
- **Electronic medical records (EMRs) and electronic patient records (EPRs)** are digital versions of an individual patient's chart, expanded for the convenience of third parties, which are created in a single institution as a component of the EHR.¹⁵ The additions to the traditional medical chart include e-prescription, clinical decision support (CDS), and computerized physician order entry (CPOE) modules.¹⁶
- **Personal health records (PHRs)** are an electronic application through which patients can access, manage, and share their own health information.¹⁷ The PHR may contain data from the EHR and from personal devices such as wearable activity trackers.
- **Patient portals (PPs)**, in addition to providing patients with access to their medical data, allow them to interact with physicians using a message system, to schedule appointments and pay medical bills.¹⁸
- **Health information exchange (HIE)** is the process of sharing EHRs among different organizations.¹⁹ The idea sounds simple, but its practical application presents

many problems. Those include: data security concerns, software interoperability, and forced collaboration among business competitors.¹⁹

The lines between these types of medical information processing are getting blurred as third parties continue to alter them. One can argue that even the term EHR is misleading, as it implies mere information storage and lends an air of a benign clinicians' tool. In reality EHRs are corporate command-and-control systems through which every care transaction must pass.

The Evolution of Medical Records

The forms and purposes of medical records have evolved through history.²⁰⁻²² Initially the only function of medical records was to help individual physicians take care of their patients. The second half of the 20th century brought numerous changes negatively affecting the medical profession, including reliance on third-party payers, a rise in medical malpractice litigation, the proliferation of medical quality assurance agencies, and the shift from the traditional fiduciary patient-physician relationship to an antagonistic consumer-provider paradigm. Consequently, the purpose of medical records has been altered, from succinct medical documents to bureaucratic behemoths that are supposed to serve many users and whose major functions are billing and legal. Medical consumerism added an additional layer. Before the era of medical consumerism, patients had little interest in reading their medical charts. However, with the advent of this approach, patients started to demand full and instantaneous access to their records.²³⁻²⁵ Advisories on how to create patient-friendly medical records have been published to help physicians with the transition in charting practices.²⁴

While medical records were being altered, paper continued to be the main medium of information storage. As new technological alternatives to paper documentation were developed, proposals for replacing the traditional medical charts with electronic systems began to appear. Initially, those propositions were way ahead of their time, since the existing technologies were not mature enough. With time this has changed. There were at least four major technological leaps, which moved the idea of EHRs from the realm of a futuristic concept into reality.²⁶ The leaps included: creation of mainframe computers, invention of personal computing, development of Internet and Cloud computing technology, and availability of hand-held devices.

Despite the technological advances, the medical community did not enthusiastically embrace EHRs. But physicians were not being Luddites. In the early days of the U.S., American physicians catapulted this nation from a Third-World medical backwater into the world's preeminent medical leader, with medical advances, invention, and innovation at a dizzying pace from the 1700s to now. Doctors

were one of the first professional groups to adopt electronics, such as pagers.²⁷ Similarly, the medical profession eagerly embraced Dictaphones, fax machines, cellular phones and laptop computers. There are clearly important limitations and concerns that cause physicians to be reluctant to incorporate the EHR into our work. The EHR controversy is not a struggle between “backward physicians” and “forward-thinking technologists.” It is a dispute of pragmatic physicians who have hard work to do in limited time with serious obligations and liabilities, versus the profit-driven, liability-free EHR pushers.

The Legislative Push for EHRs

Government and corporate officials, whose lives EHRs made easier, did not appreciate that this method became an obstacle in medical practice. Third parties, who do not need the medical record for anything other than deciding minimum payments and abstracting statistics, decided that something must be done to speed up the process. Regulatory events, not technological breakthroughs, are responsible for the encroachment of substandard EHR systems into clinical practice. Those political actions include but are not limited to the following:

- **1996 HIPAA.** In 1996, Congress passed the Health Insurance Portability and Accountability Act (HIPAA).²⁸ While EHRs were not the focus of this act, the Act required the establishment of national standards for EHRs. It was the first large-scale legislative action dealing with the EHR.
- **2004 SOTU.** In his January 2004 State of the Union address, President George W. Bush, who has never taken care of a single patient, and who has no medical qualifications, stated: “By computerizing health records, we can avoid dangerous medical mistakes, reduce costs and improve care.”²⁹
- **2009 HITECH.** The Health Information Technology for Economic and Clinical Health (HITECH) Act³⁰ outlined the plans for the adoption of EHRs through “Meaningful Use” (MU). This Orwellian term was defined as a way for “providers” to be made to show they are using certified EHR technology in ways that can yield measures assumed to be proxies for quality and quantity, so that payers can have a benchmark for payment. “Meaningful Use” became such a complex matter that its discussion would require a separate review. In brief, HITECH appropriated billions of dollars for bribes to physicians who would meet MU criteria. Physicians who would not adopt an MU-certified EHR by 2015 were to be penalized. Legislators believed that such bribes and penalties should increase demand for EHR. This plan did not work. MU requirements have ironically slowed technological advancements since EHR developers concentrated on MU compliance instead of improvements.³¹ Furthermore, the impact of the MU

program on the rate of EHR adoption was minimal.³¹ An eye-opening commentary about the disappointing results of “Meaningful Use” has been published recently.¹²

- **2010 ACA.** The passage of President Barack Obama’s Patient Protection and Affordable Care Act (ACA)³² in 2010 introduced additional regulations pertaining to EHRs.
- **2012 FDASIA.** Part of the Food and Drug Administration Safety and Innovation Act (FDASIA)³³ recommended development of a risk-based regulatory framework for health IT, including medical mobile applications. Unlike HITECH, FDASIA does not mandate specific EHR solutions. It is a call to work on new more effective legislative mandates and to fix the deficiencies of existing ones.
- **2016 21st Century Cures Act.** This Act bolsters the hard-line EHR approach. Among other things, it empowers the federal Health Information Technology Advisory Committee to vigorously coerce EHR adoption, and authorizes the inspector general to penalize medical “information blocking.”³⁴⁻³⁶

Use of government force to impose the EHR is favored by legislators on both sides of the political aisle. Therefore, more legislative acts dealing with EHR are likely to come, no matter which political party is in power.

Who Is Affected by the EHR?

The EHR affects many different groups, including patients, physicians and other medical personnel, government and corporate beneficiaries, and researchers.

- **Patients** are certainly the most important group affected by what has happened to their medical records. They are frequently casualties of the strife caused by government and corporate interference in the medical record.
- **“Primary EHR users”** are physicians who have been coerced to use EHRs in their work, and therefore know the EHR pitfalls well.
- **“Secondary beneficiaries”** are those other than physicians, patients, and researchers who derive various benefits from EHRs. Many of them also wield substantial regulatory and administrative power over physicians, nurses, and other medical personnel. The following groups can be classified as secondary beneficiaries of EHR: Third-party payers (Medicare, Medicaid, and corporations); law enforcement and quality assurance organizations; malpractice litigators; politicians; large healthcare systems (hospitals, mega-practices); EHR software/hardware manufacturers, vendors, and management consultants.
- **Researchers** have always seen an enormous potential in the EHR. Researchers, unlike most of the secondary beneficiaries, do not possess significant political powers. In fact, many of the legislative mandates interfere with their access to EHRs.³⁷

Who Are EHR Proponents and Opponents?

The EHR is favored mainly by government and pre-paid medical plan corporations, researchers,³⁷ and to a lesser degree by certain groups of patients³⁸ and a narrow segment of physicians.³¹ From its inception, the EHR concept has been very appealing to the government and corporations. This is understandable, since they derive many benefits but do not experience the EHR's negative consequences. Patients' opinions about EHR are changing and are influenced by their personal experiences, and by mass media coverage.³⁸ Physicians' attitudes toward EHRs have changed.³¹ Initial enthusiasm about them has been followed by significant disappointment.^{1,4,31}

EHRs were much less favorably received and continue to be seen skeptically by private physicians in small practices, and groups of patients concerned about information privacy and medical costs.

Promises and Outcomes of EHRs

In many publications the advantages and disadvantages of EHRs are discussed globally,^{6,16,29} without considering that benefits and drawbacks can be different for different groups. Such a global approach diverts attention from the intense conflict of interest between physicians and the government and corporate bodies. Therefore, we will discuss the pros and cons of EHRs in the context of their impact on physicians and patients.

The alleged improvement of medical care by EHR is a mantra repeated often by the government and pre-paid medical care corporations. However, the opposite was shown to be true.^{1,6} Government and corporations claim to be ardent followers of evidence based medicine (EBM). Yet, they did not bother to adhere to such principles while promoting EHR. When this cognitive dissonance was noted, they produced several studies favoring EHR use. Those research projects included two VA studies,^{39,40} the RAND Corporation research paper,⁴¹ and the Foundation for the eHealth Initiative research project.⁴² These publications were touted as the prima-facie evidence of EHR benefits. Yet, the conclusions presented in those papers were immediately considered to be questionable by the medical community.¹ Those studies were succinctly summarized by Groopman and Hartzband as "exercises in wishful thinking."⁴³ Himmelstein and Woolhandler went further in their criticism by stating: "These researchers supply numbers—big numbers with lots of trailing zeros—to back politicians' (and vendors') promises, leaving the reader impressed that the case for massive investment in EMR is compelling. But even a cursory glance behind the numbers reveals a disturbing array of unproven assumptions, wishful thinking, and special effects."¹

If EHRs decreased the cost of care as is claimed, this would help patients. Numerous studies have failed to demonstrate such an effect.^{1,6,44}

The on-line scheduling and e-mailing capabilities of patient portals¹⁸ are certainly convenient. However, stand-alone scheduling and messaging applications could exist without the EHR. Several authors claimed that the EHR's automated reminders (visits, vaccinations, etc.) could increase patient compliance.¹ Yet, the Congressional Budget Office (CBO) in its 2004 report concluded that there is insufficient evidence that such reminders are beneficial.⁴⁵ Patient portals can also give patients access to tests results and progress notes. Such instant access is a basic tenet of "medical consumerism." Before this era, patients preferred to wait for physicians to explain their test results. They also had little interest in reading their doctors' notes. In theory, giving patients full access to their records sounds egalitarian and sensible. In practice, the unassisted access of patients to progress notes and test results, interpretation of which is not in their field of experience or education, can cause more difficulties than benefits. Not surprisingly, some patient portals became tools of deception. They create the impressions of full access to medical records, while providing a limited gateway to selected tests, and hiding progress notes. For business leaders such a deceptive approach is easier than honestly explaining to "consumers" that certain things are not in their best interest.

EHRs have many drawbacks for patients. The principal disadvantage is a decreased quality of medical care and increased medical risks resulting from overly enthusiastic implementation of EHR, as discussed above.

Privacy concerns related to EHR are very common.¹⁶ No online database is impenetrable to hackers, or safe from accidental breaches.⁴⁶ Because the EHR combines the medical and billing information, the data at stake includes health and financial information. Compromising the EHR does not require sophisticated hackers. People with access to the record can be bribed, or may simply act recklessly, compromising the privacy of millions.⁴⁷

Although touted as the pinnacle of "patient-centered" medical care, the EHR has decreased face-to-face interactions of patients with physicians, leading to computer-centered medicine. The attention of the physician has been shifted from interacting with a patient to interacting with data-entry terminals, while the patient sits unobserved and ignored, staring at the physician's back hunched over a computer. This paradox has been reported by individual physicians¹² and confirmed by research studies.^{48,49} Such a situation is detrimental to the quality of care and patient satisfaction.

Accessibility is a problem for the large segment of the population without the access to computers and Internet. While young persons generally have no problems with the use of IT, many older, and therefore much sicker patients find the use of the patient portal to be difficult.

The net effect of EHRs on patients, based upon the body of well-designed research and individual observations, is detrimental.^{1,4}

EHR promoters' promises to physicians to improve quality of care have not been kept.^{1,6,19} But what about convenience? The traditional paper medical chart could be cumbersome. It might be missing important pages and could be misplaced or lost, or destroyed in a natural disaster. It could be marred by illegible handwriting. Access to the chart was limited to physicians who were physically present. The EHR promised to solve those problems. Unfortunately, software has been a nightmare.^{1,16} Initial versions of the software were designed to create manageable printouts fitting the old-fashioned binders. However, new generations of EHR abandoned this paper-friendly formula for unprintable virtual matrix formats. This is discouraging and frustrating to private physicians who want to maintain a mixture of old-fashioned charts and EHR. Many EHRs require expensive large displays and are hard to use with small screens of tablets or laptops. The number of hospital terminals is insufficient. Concerns about security have limited off-campus access to EHRs. Unless redundant remote backups exist, the digital data are vulnerable to permanent destruction even more readily than paper records.⁵⁰

Numerous features of the EHR were supposed to boost clinical efficiency. Those features included: clinical decision support (CDS), clinical alerts, computerized physician order entry (CPOE), and e-prescribing modules.

CDS is made up of computer algorithms within the EHR that link patient data with knowledge bases and generate management suggestions for physicians.⁵¹ This idea appeared to be laudable in theory, but it led to numerous negative consequences.⁵² Research demonstrated that CDS has actually decreased physicians' efficiency and quality of care. Those counter-intuitive results were caused by the inability of the CDS modules to emulate the thinking process of the physician.⁵² Similarly, clinical alerts were shown to make the EHR extremely inefficient. Murthy et al. demonstrated that primary care physicians lost more than one hour per day sorting through EHR alerts while missing the relevant test results.⁵³ Likewise, computerized physician order entry (CPOE) did not curb unnecessary duplication of ordered tests as expected. This expectation was based upon the result of a single VA based study,³⁹ which could not be duplicated.^{1,4} EHR-based e-prescribing fared relatively better.⁵⁴ However, e-prescribing could be done without a cumbersome, inefficient, error-prone EHR. Some EHRs are detrimental to e-prescribing since their standard clinical decision support system interferes with it.

The purported blessing of improved billing became a curse. The push for integration of data mandated for billing purposes into the EHR progress notes had disastrous consequences. It transformed concise, clinically relevant medical record notes into a voluminous, redundant, and convoluted billing justification document.¹² Medically pertinent data are lost in the sea of clinically irrelevant information and erroneous auto-generated texts.

EHR's Adverse Effects on Physicians

The need for the government to bribe and coerce physicians to adopt the EHR by mandates and regulations is a sign of its low value. As with many similar programs, the amount of the bribe is much lower than the losses suffered due to non-compliance with the accompanying regulations.¹²

The administrative burden has increased, as research has shown,^{1,3,4,48,55} because of the erroneous belief on the part of those in government and corporations, who have never taken care of a single patient, that the EHR would allow physicians to enter enormous amounts of data without errors during the short period of a patient's visit. The electronic boilerplate scripts, drop-down menus, check-boxes, and use of copy-and-paste functions were supposed to be the main conduits of this "efficiency revolution." Without any testing, government and corporate functionaries jumped to the conclusion that clicking check-boxes, dealing with drop-down menus, cutting and pasting boilerplate scripts, and all the rest, would be more accurate and faster than the use of dictation. Transcription services have been eliminated⁵⁵ in favor of coercing physicians to scroll through dozens of possible choices from lists of descriptions, lab tests, and so on and on.

Soon it became obvious that modern data-entry technology creates a nightmare of error and confusion. Reliance on auto-population algorithms and "cutting/pasting" produces an EHR containing contradictory information. It is far inferior to the much-mourned medical record that actually assisted the physician in taking care of the patient. It is common to see a review of systems containing "denies headaches" for a patient with a chief complaint of headaches. The EHR has increased the frequency of errors and the amount of time physicians spend on time-wasting clerical tasks, diverting them from direct patient care.^{1,3,55}

In a study heralded as the ultimate proof of EHRs' detrimental impact, Sinsky et al. reported that for every hour that physicians spend with patients, they spend two more hours wrangling with the EHR during work, and two more hours during personal time.³ Shanafelt et al. showed that the prevalence of physician burnout was significantly higher among physicians who used EHRs than among those who did not, despite their reported satisfaction with the technology itself.⁵⁵

Cost, despite optimistic expectations, is enormous. EHR-related hardware, software, support, and training are very expensive.⁴⁴ This puts serious financial hardships on medical practices, which are already struggling with massive government regulation, bureaucracy, constant changes in medical "codes," and so on.

Loss of autonomy is an ever-present threat. CDS systems could be set up to restrict physicians' ability to order tests or prescribe medications. Opportunities for CDS misuse by administrators and payers are obvious.¹⁶

Liability is increased, not decreased as initially hoped. The EHR is a very poor legal defense tool for physicians.^{50, 56, 57} As

noted by Hoffman, privacy breaches, accidental destruction of EHR data, pervasive errors in data entry, omission of the alerts, etc., increase legal risks for physicians.⁵⁰ Instead of protecting them, EHR use makes physicians subject to “eDiscovery,”⁵⁷ and therefore causes “eLiability” as discussed in detail by Vigoda et al.⁵⁶ Moreover, clinicians are held liable for the medical errors resulting from the flawed or malfunctioning EHR.

The net effect of EHRs on physicians is negative, based on available objective evidence. In their extensive meta-analysis, Greenhalgh et al.⁶ stated that: “EMR use will always require human input to recontextualize knowledge; that even though secondary work (audit, research, billing) may be made more efficient by EMR, primary clinical work may be made less efficient; that paper may offer a unique degree of ecological flexibility; and that smaller EMR systems may sometimes be more efficient and effective than larger ones.” In keeping with this, Himmelstein,⁵ who has analyzed data from three large EHR sources, has determined that: “As currently implemented, hospital computing might modestly improve process measures of quality but does not reduce administrative or overall costs.”

EHR Effects on Secondary Beneficiaries

EHRs have a definitely positive net effect on researchers and their work.³⁷ The numerous benefits for scientists of having access to large electronic databases of medical data are plainly evident. The drawbacks include legal risks associated with non-compliance with privacy rules, and scientific risks of reliance on erroneous data that could be entered inaccurately into the EHR.

The EHR as a control tool is a dream come true for government and corporations. It allows administrators to monitor and influence the ways in which physicians practice. Data-mining algorithms permit statistical analysis of physicians’ prescribing and test-ordering patterns. The “disruptive” outliers can be identified and dealt with. Physicians’ work can be analyzed in terms of profitability or cost to the government and to corporations. Subsequently, “counter-measures” can be applied by CDS systems to eliminate undesirable physicians from the standpoint of government and corporations. Payers can use EHR data in so-called “pay-for-performance” schemes. Acting in collusion with administrators, they can use CDS systems for “cost-containment.” Health quality enforcers can conduct instantaneous investigations and compare a physicians’ practice pattern to “prevailing standards” and “evidence based” clinical guidelines. Malpractice litigators very swiftly recognized the advantages of EHR-related “eDiscovery” and are eagerly seizing on this new money-making opportunity.⁵⁷

The EHR offers many opportunities for pecuniary gain. Government and corporate payers welcome tools for cost-containment and profit boosting. EHR manufacturers and

vendors are guaranteed profits from sales and servicing of EHR software and hardware when the use of EHR is mandated.

There are no drawbacks for government or corporations from EHR use. For all secondary beneficiaries, the net effect of the EHR is overwhelmingly positive.

Conclusions

Well-designed research studies refute the enthusiastic expectations about EHR. Such studies provide very valuable evidence in discussion of its future directions. However, the research studies per se will not rectify the accelerating EHR debacle. Powerful EHR proponents will not be persuaded by scientific data. They have an agenda, and the EHR serves it well. Physicians can spend decades performing more intricate studies of the obvious shortcomings of the EHR. In the meantime, government and corporations will continue as the only parties to reap any benefits from the EHR while experiencing no negative consequences. The public, i.e. voters and captive members of corporate pre-paid medical plans, should be a primary target of persuasion about the drawbacks of the EHR. Many patients are unaware that use of the substandard EHR is imposed on physicians. There is need for a comprehensive public education campaign about the oppressive EHR. Such education should start in physicians’ offices and spread by social and mainstream media. Public pressure may persuade government and corporate executives to listen to physicians’ concerns about the serious deficiencies of the EHR.

Hermann W. Børg, M.D., is a neuro-endocrinology independent contractor at the University of North Carolina School of Medicine at Chapel Hill, N.C. Contact: dr.hermann.borg@neuro-surgery-research.com.

REFERENCES

1. Himmelstein DU, Woolhandler S. Hope and hype: predicting the impact of electronic medical records. *Health Aff (Millwood)* 2005;24(5):1121-1123. doi:10.1377/hlthaff.24.5.1121.
2. Weed LL. Medical records that guide and teach. *N Engl J Med* 1968;278(11):593-600. doi:10.1056/NEJM196803142781105.
3. Sinsky C, Colligan L, Li L, et al. Allocation of physician time in ambulatory practice: a time and motion study in 4 specialties. *Ann Intern Med* 2016;35:1-8. doi:10.7326/M16-0961.
4. Hingle S. Electronic health records: an unfulfilled promise and a call to action. *Ann Intern Med* 2016;91:836-848. doi:10.7326/M16-1757.
5. Himmelstein DU, Wright A, Woolhandler S, et al. Hospital computing and the costs and quality of care: a national study. *Am J Med* 2010;123:40-46. doi:10.1016/j.amjmed.2009.09.004.
6. Greenhalgh T, Potts HWW, Wong G, Bark P, Swinglehurst D. Tensions and paradoxes in electronic patient record research: a systematic literature review using the meta-narrative method. *Milbank Q* 2009;87:729-788. doi:10.1111/j.1468-0009.2009.00578.x.
7. U.S. Department of Health and Human Services, Centers for Medicare & Medicaid Services Medicare and Medicaid Programs. Electronic Health Record Incentive Program: Final Rule. 42 CFR Parts 412, 413, 422 et al.
8. Russell J. Beleaguered by electronic record mandates, some doctors burning out. *Chicago Trib*, Dec 12, 2015.
9. Parks T. How EHRs tied up physician time in 2015. *AMA Wire*, Dec 11, 2015.

10. AAPS. Electronic health record could crash medical system, warns Association of American Physicians and Surgeons. PR Newswire, Dec 15, 2015. Available at: www.prnewswire.com/news-releases/electronic-health-record-could-crash-medical-system-warns-association-of-american-physicians-and-surgeons-aaps-300193160.html. Accessed May 13, 2017.
11. Philips D. EHR burden weighs heavily on physicians, leads to burnout. *Medscape*, Sep 6, 2016. Available at: www.medscape.com/viewarticle/868421. Accessed May 13, 2017.
12. Huntoon L. The disaster of electronic health records. *J Am Phys Surg* 2016;21(2):35-37.
13. Hart G. The five W's: An old tool for the new task of task analysis. *Tech Commun*. 1996;43(7):139-145.
14. Robertson DW. A note on the classical origin of "circumstances" in the medieval confessional. *Stud Philol*. 1946;43(1):6-14.
15. Gunter TD, Terry NP. The emergence of national electronic health record architectures in the United States and Australia: models, costs, and questions. *J Med Internet Res* 2005;7(1):e3. doi:10.2196/jmir.7.1.e3.
16. Menachemi N, Collum TH. Benefits and drawbacks of electronic health record systems. *Risk Manag Healthc Policy* 2011;4:47-55. doi:10.2147/RMHP.S12985.
17. Tang PC, Ash JS, Bates DW, Overhage JM, Sands DZ. Personal health records: definitions, benefits, and strategies for overcoming barriers to adoption. *J Am Med Informatics Assoc* 2006;13(2):121-126.
18. Terry K. Patient portals: beyond Meaningful Use. *Physicians Pract*, Jun 27, 2010.
19. Vest JR, Gamm LD. Health information exchange: persistent challenges and new strategies. *J Am Med Inform Assoc* 2010;17:288-294. doi:10.1136/jamia.2010.003673.
20. Gillum RF. From papyrus to the electronic tablet: A brief history of the clinical medical record with lessons for the digital age. *Am J Med* 2013;126:853-857. doi:10.1016/j.amjmed.2013.03.024.
21. Siegler EL. The evolving medical record. *Ann Intern Med* 2010;153:671. doi:10.7326/0003-4819-153-10-201011160-00012.
22. Hayes GM. Medical records: past, present, and future. Proceedings of Conference, Am Med Informatics Assoc. AMIA Fall Symp 1996:454-458.
23. Shenkin BN, Warner DC. Sounding board. Giving the patient his medical record: a proposal to improve the system. *N Engl J Med* 1973;289:688-692. doi:10.1056/NEJM197309272891311.
24. Klein JW, Jackson SL, Bell SK, et al. Your patient is now reading your note: opportunities, problems, and prospects. *Am J Med* 2016;129:1018-1021. doi:10.1016/j.amjmed.2016.05.015.
25. Ross SE, Lin C-T. The effects of promoting patient access to medical records: a review. *J Am Med Inform Assoc* 2003;10:129-138. doi:10.1197/jamia.m1147.
26. Tripathi M. EHR Evolution: policy and legislation forces changing the EHR. *J AHIMA* 2012;83(10):24-29.
27. Ennis C. Pocket Radio pages doctors night or day. *Pop Sci*, January 1951.
28. 104th Congress. H.R. 3103. Health Insurance Portability and Accountability Act of 1996.
29. Atherton J. Development of the electronic health record. *Am Med Assoc J Ethics*. 2011;13(3):186-189.
30. U.S. Congress. Health Information Technology for Economic and Clinical Health (HITECH) Act, Title XIII of Division A and Title IV of Division B of the American Recovery and Reinvestment Act of 2009 (ARRA), Pub. L. No. 111-5, 123 Stat. 226 (Feb. 17, 2009).
31. Menemeyer ST, Menachemi N, Rahrkar S, Ford EW. Impact of the HITECH act on physicians' adoption of electronic health records. *J Am Med Inf Assoc* 2016;23(2):375-379. doi:10.1093/jamia/ocv103.
32. U.S. Congress. Patient Protection and Affordable Care Act, 42 U.S.C. § 18001 et Seq. (2010).
33. Slight SP, Bates DW. A risk-based regulatory framework for health IT: recommendations of the FDASIA working group. *J Am Med Inform Assoc* 2014;21(e2):e181-4. doi:10.1136/amiajnl-2014-002638.
34. AAPS. AAPS physicians urge a 'no' vote for the misnamed 'CURES Act' in the lame-duck session of Congress. PRNewswire, Nov 29, 2016. Available at: <http://www.prnewswire.com/news-releases/aaps-physicians-urge-a-no-vote-for-the-misnamed-cures-act-in-the-lame-duck-session-of-congress-300369919.html>. Accessed May 14, 2017.
35. Lowe R. Congress passes 21st century CURES bill. *Medscape*, Dec 7, 2016.
36. Davis J. 21st century CURES Act brings provisions for EHRs, interoperability, precision medicine and more. *Health IT News*, Dec 1, 2016.
37. Coorevits P, Sundgren M, Klein GO, et al. Electronic health records: new opportunities for clinical research. *J Intern Med* 2013;274(6):547-560. doi:10.1111/joim.12119.
38. Luchenski SA, Reed JE, Marston C, et al. Patient and public views on electronic health records and their uses in the United Kingdom: cross-sectional survey. *J Med Internet Res* 2013;15(8):e160. doi:10.2196/jmir.2701.
39. Evans DC, Nichol WP, Perlin JB. Effect of the implementation of an enterprise-wide electronic health record on productivity in the Veterans Health Administration. *Heal Econ Policy Law* 2006;1(2):163. doi:10.1017/S1744133105001210.
40. Kupersmith J, Francis J, Kerr E, et al. Advancing evidence-based care for diabetes: lessons from the Veterans Health Administration. *Health Aff* 2007;26(2):w156-w168. doi:10.1377/hlthaff.26.2.w156.
41. Hillestad R, Bigelow J, Bower A, et al. Can electronic medical record systems transform health care? Potential health benefits, savings, and costs. *Health Aff (Millwood)* 2005;24(5):1103-1117. doi:10.1377/hlthaff.24.5.1103.
42. Walker J, Pan E, Johnston D, et al. The value of health care information exchange and interoperability. *Health Aff* 2005;35(11). doi:10.1377/hlthaff.w5.10.
43. Gropman J, Hartzband P. Obama's \$80 billion exaggeration. *Wall St J*, Mar 12, 2009.
44. Eastaugh SR. The total cost of EHR ownership. *Healthc Financ Manage* 2013;67(2):66-70.
45. Congressional Budget Office. An Analysis of the Literature on Disease Management Programs; 2004.
46. Foreman J. At risk of exposure: in the push for electronic medical records, concern is growing about how well privacy can be safeguarded. *LA Times*, Jun 26, 2006.
47. Frieden T, Walton M. FBI seeks stolen personal data on 26 million vets. CNN.com, May 23, 2006.
48. Asan O, Smith PD, Montague E. More screen time, less face time—implications for EHR design. *J Eval Clin Pract* 2014;20(6):896-901. doi:10.1111/jep.12182.
49. Makoul G, Curry RH, Tang PC. The use of electronic medical records: communication patterns in outpatient encounters. *J Am Med Inform Assoc* 2001;8(6):610-615.
50. Hoffman S, Podgurski A. E-health hazards: Provider liability and electronic health record systems. *Berkeley Tech Law J* 2009;24(1523). doi:10.15779/Z38C68D.
51. Beeler P, Bates D, Hug B. Clinical decision support systems. *Swiss Med Wkly*, December 2014. doi:10.4414/smw.2014.14073.
52. Ash JS, Sittig DF, Campbell EM, Guappone KP, Dykstra RH. Some unintended consequences of clinical decision support systems. AMIA . Annu Symp proceedings. AMIA Symp. 2007;2007:26-30.
53. Murphy DR, Meyer AND, Russo E, et al. The burden of inbox notifications in commercial electronic health records. *JAMA Intern Med* 2016;176:559. doi:10.1001/jamainternmed.2016.0209.
54. Grossman JM, Cross DA, Boukus ER, Cohen GR. Transmitting and processing electronic prescriptions: experiences of physician practices and pharmacies. *J Am Med Inform Assoc* 2012;19(3):353-359. doi:10.1136/amiajnl-2011-000515.
55. Shanafelt TD, Dyrbye LN, Sinsky C, et al. Relationship between clerical burden and characteristics of the electronic environment with physician burnout and professional satisfaction. *Mayo Clin Proc* 2016;91:836-848. doi:10.1016/j.mayocp.2016.05.007.
56. Vigoda MM. e-Record, e-Liability: addressing medico-legal issues in electronic records. *J AHIMA* 2008;79(10):48-52.
57. Carlson S, Lipinski R. eDiscovery: a new approach to discovery in federal and state courts. *Ill Bar J* 2007;95:184-87.