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MARKET WATCH

It Ain't Necessarily So: The Electronic Health Record And The Unlikely Prospect Of Reducing Health Care Costs

Much of the literature on EHRs fails to support the primary rationales for using them.

by Jaan Sidorov

ABSTRACT: Electronic health record (EHR) advocates argue that EHRs lead to reduced errors and reduced costs. Many reports suggest otherwise. The EHR often leads to higher billings and declines in provider productivity with no change in provider-to-patient ratios. Error reduction is inconsistent and has yet to be linked to savings or malpractice premiums. As interest in patient-centeredness, shared decision making, teaming, group visits, open access, and accountability grows, the EHR is better viewed as an insufficient yet necessary ingredient. Absent other fundamental interventions that alter medical practice, it is unlikely that the U.S. health care bill will decline as a result of the EHR alone. [*Health Affairs* 25, no. 4 (2006): 1079–1085; 10.1377/hlthaff.25.4.1079]

AFTER EXTOLLING THE virtues of the electronic health record (EHR) in his 2004 State of the Union Address, President George W. Bush established the Office of the National Health Information Technology Coordinator (ONCHIT) and charged it with developing a “health information technology infrastructure” that “reduces health care costs resulting from inefficiency, medical errors, inappropriate care and incomplete information.”¹ This charge includes the adoption of EHR systems that can “reduce health care costs by up to 20% per year.”² Retail sales, financial services, and telecommunications are examples of industries using information technology (IT) to achieve quality and savings. Accordingly, the same lesson can be applied to U.S. health care.

Or can it? A considerable body of evidence

suggests that widespread adoption of the EHR increases health care costs. Although the focus of this paper is on the limitations of the EHR in ambulatory care, ample research shows that this might likewise apply to inpatient settings.

■ **EHR definition and uptake.** The Healthcare Information and Management Systems Society (HIMSS) defines the EHR as a “longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting.” It does more than store information: It “supports other care-related activities directly or indirectly, including evidence-based decision support, quality management and outcomes reporting.”³ According to the National Health Care Survey, EHRs were in use in 17 percent of physicians’ offices, 31 percent of emergency rooms, and 29 percent of hospital outpatient

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departments in 2003.⁴ In office settings, the 17 percent figure has not changed since 2001.⁵

■ **Cost savings.** Given the inflationary \$1.9 trillion cost of U.S. health care, 20 percent savings is significant.⁶ A RAND analysis estimated that national adoption of the EHR could lead to “more than \$81 billion” in annual savings, while Jan Walker and colleagues estimated that information exchange across providers, hospitals, public health, and payers could save \$77.8 billion per year.⁷

The Case For The EHR

As noted, the EHR's potential is based on its ability to introduce new efficiencies to health care delivery. Each is examined below.

■ **Worker productivity gains.** One analysis showed that the EHR increased documentation time among physicians by approximately 17 percent, while computerized provider order entry (CPOE) increased it by 98 percent.⁸ In a separate study, EHR implementation at Kaiser Permanente resulted in a 5–9 percent decrease in office visits replaced by telephone contacts.⁹ Even if future “smart texts” or automated physician orders correct these inefficiencies, it is unclear whether the EHR enables gains in provider-to-patient ratios. Rather, these studies suggest that a possible outcome is that the same providers would serve the same patients, with fewer office visits, more remote communication, and more documentation.

However, the EHR can enable clerical staff reductions amounting to \$13,000 per physician per year.¹⁰ For these savings to be realized, staff employment would need to be completely terminated. Although this is likely in outpatient settings, anecdotes of health care systems (where EHRs are prevalent) offering displaced workers other employment opportunities (including in IT departments) are commonplace enough to dilute these savings.

Ultimately, if the EHR consistently reduced labor costs, lower staffing ratios should enable insurers—representing the “front line” in managing health care costs—to reduce their fee schedules among EHR-enabled providers. The same should be true for participants in con-

sumer-directed health plans. There is little evidence that this is occurring among the 17 percent of practices possessing an EHR.

■ **Billing optimization.** Not only are the EHR's labor savings questionable, but increased billings are another likely outcome. Thanks to underlying decision logic previously only available to large institutions, the EHR can “auto-populate” or scour the record to justify a greater intensity of service. Accordingly, “increased coding levels” account for the return on investment.¹¹ Alternatively, better “capture of charges” and fewer “billing errors” can lead to a five-year \$86,400 “benefit” per provider.¹²

Although additional detail may warrant increased payment, the “content” might be unchanged from the point of view of the patient (the end user). Physicians are prone to underdocumentation, but these EHR enhancements, appropriate or not, arguably increase health care costs without any corresponding increase in quality.

■ **Medical mistake avoidance.** EHR advocates point to “decision support” that reduces errors of omission and commission at the point of care as a critical safety advantage.¹³ The Agency for Healthcare Research and Quality (AHRQ) has endorsed several IT interventions that promote patient safety (such as error tracking and alerts about the timing of tests); however, mention of the EHR is conspicuously absent.¹⁴ In fact, AHRQ's “20 tips to help prevent medical errors” also fail to mention the EHR, versus interventions such as hand washing or relying on large-volume hospitals for complicated surgeries.¹⁵ The EHR's failure to pass muster with AHRQ's evidence-based approach to translating research into practice might explain the necessity of funding a large number of projects to better evaluate the EHR's role in patient safety.¹⁶

Indeed, the available evidence is decidedly mixed. Examples of omission-type error reductions include alerts about vaccination status among children cared for in the emergency department; inpatient vaccination and anticoagulation reminders; diabetes, hypertension, vitamin B12 deficiency, thyroid and ane-

mia screening in the elderly; health maintenance and counseling in a pediatric practice; and hypertension identification and control.¹⁷ However, EHR decision support has no effect on adherence to primary care guidelines for asthma or angina management; it leads to “variable” and “limited” adherence to diabetes and coronary artery disease reminders; it has no effect on evidence-based interventions for heart disease and heart failure; it causes no change in the care of patients with depression; it leads to “unwieldy” tracking and monitoring of preventive health and chronic illness; and it has no impact on diabetic glucose control.¹⁸

Why such inconsistency? Physicians might resent the loss of professional autonomy or have limited tolerance for on-screen prompts.¹⁹ In one survey, 75 percent of physician respondents admitted ignoring reminder icons, and more than half seldom or never acted on the information.²⁰ The EHR also impedes addressing other immediate patient needs in a time-limited office visit.²¹

EHR advocates also point to errors of commission. For example, important information might be missing from paper records, including radiology or laboratory tests.²² Accordingly, if inaccessible records are responsible for costly retesting, reductions should be readily achievable. This was not the case at Kaiser Permanente, where “use of clinical laboratory and radiology services did not change conclusively” over a two-year transition to the EHR.²³

Excessive testing could be more a function of defensive medicine, ease, or fear of uncertainty.²⁴ EHR decision support tools—including peer management, guideline promotion, and alerts about cost or redundancy—might reduce this.²⁵ However, an EHR-based decision support system that is cost-saving, generalizable, and sustainable remains elusive. Finally, ancillary testing is an important source of revenue. “Profit center” laboratory or radiology departments will not necessarily welcome EHR-based interventions that lead to fewer tests and less revenue.

■ Storage of other encounter data.

Medical records are notoriously vulnerable to damage or disappearance. Hurricane Katrina’s

destruction of Gulf Coast physician office practices has been cited as an example of the need for electronic medical information storage.²⁶ Yet Hurricane Katrina’s cost was not factored into any of the previous savings estimates; in fact, the president’s endorsement of the EHR predated this disaster by more than a year. Furthermore, the history remains a time-honored and reimbursable feature of every physician-patient encounter. Aside from the few situations in which patients are too ill to communicate, patients’ recall of past medical facts is accurate across a wide range of conditions.²⁷ It is also far cheaper than remote storage.

■ **Medication error avoidance.** Inpatient medication errors can occur at a rate of 142 per 1,000 patient days.²⁸ Both EHR-based decision support and CPOE can decrease these errors and reduce costs.²⁹ Furthermore, ready retrieval of medication lists is an intuitively valuable attribute of these systems.

However, not all reports on CPOE are positive. Its introduction in one pediatric intensive care unit led to an increase in mortality rates that was blamed on delays and increased documentation time, compounded by policies that diminished access to life-saving therapies and hampered communication among team members.³⁰ CPOE might pose other unique threats to medication safety, including fragmented displays, inflexible formats, missed renewal notices, and dosage guideline misinterpretations.³¹

Assuming that CPOE is ultimately vetted, the terms *CPOE* and *EHR* are not synonymous. The former can be implemented without the uncertainty of the latter. It also remains to be seen whether hospitals will pass any CPOE savings to health insurers or consumers.

■ **The cost of quality.** Cost savings associated with the EHR’s quality-based interventions vary and occupy time lines extending beyond one year.³² For example, influenza vaccination in the elderly costs less than \$0 per quality-adjusted life year (QALY). In contrast, beta-blockers in coronary artery disease and hypertension cost up to \$10,000 and \$50,000 per QALY, respectively.³³ Accordingly, if the

EHR leads to increases in such interventions, more lives saved will come at a heavy price.

■ **Malpractice reduction.** Physician malpractice premiums are blamed as one reason for rising health care costs. Noting that malpractice suits result from “systems errors,” the U.S. Department of Health and Human Services (HHS) has endorsed “voluntary standards necessary to make the creation of an electronic health care record possible.”³⁴ Yet no reports link the EHR to a reduction in malpractice suits—they find only that hospital risk managers are “looking” for such a reduction to occur.³⁵ According to a continuing medical education course developed by a major Pennsylvania malpractice insurer, there are too few court cases to assess the EHR’s role in countering malpractice allegations.³⁶

Although hospitals have reason to believe that CPOE or an EHR might lessen their malpractice exposure, liability insurers typically adjust physicians’ premiums by specialty, location, past malpractice experience, obtaining selected education credits, or participating in risk management activities. In contrast, there are no reports yet that many major physician malpractice insurers are prepared to reduce premiums because of the presence of an EHR.

Little wonder. Physicians’ quality of care has less to do with being sued than with having an uninterested demeanor; failing to diagnose or consult; and providing negligent fracture, operative, maternity, or trauma care.³⁷ It is not intuitively obvious how the EHR can alter these. However, two other reasons for malpractice allegations—medication error and failure to document a retrievable informed consent—might be favorably influenced. The EHR has yet to be quantified or consistently used to reduce malpractice premiums or health care costs.

■ **Impact on outcomes.** In addition to the EHR’s individual impact, the technology should also facilitate aggregate outcome studies.³⁸ Patient registries could presumably be tapped for population-based, real-world research; quality improvement studies; or cost-effectiveness analyses. Yet the impact on savings is unclear. Gains in avoiding paper chart

reviews would be possible only if the savings were greater than the labor and capital costs of setting up a patient registry. It also remains to be seen if new insights from EHR-based research can easily be mainstreamed, since, as noted above, its ability to promote long-established interventions is spotty.

The Veterans Health Administration (VHA) has demonstrated that EHR-facilitated measures of quality can support physician feedback driven by work-unit leadership.³⁹ Given the autonomy enjoyed by non-VHA physicians, behavior changes are less dependent on the EHR than on other factors, including local accountability.

It should also be noted that the prospect of easy access to the EHR partially fueled adoption of the Health Insurance Portability and Accountability Act (HIPAA) in the first place.⁴⁰ Cost burdens associated with HIPAA are considerable. For example, one report documented that HIPAA compliance with a coronary artery disease registry led to more than \$8,700 and \$4,500 in incremental and follow-up yearly study costs, respectively.⁴¹

The Stakes For Physician Practices

The fact that the U.S. government spent the considerable sum of \$900 million in 2004 to promote health care IT suggests that doubts persist about its marginal utility.⁴² The same is true for retail banking, where similar issues of interoperability persist and data entry remains very much a human task.⁴³ Physicians must ponder the EHR’s estimated start-up and ongoing costs of \$44,000 and \$8,500, respectively. As previously noted, the “bottom line” rests on recouping the capital outlay by billing more for the same services, while simultaneously lowering personnel costs.⁴⁴ Local market expectations, “branding” advantages, and increased patient volume are other rationales for using the EHR. Despite doubt that quality is served, there may also be income opportunities from pay-for-performance, including efficient patient identification, recruitment, and data reporting.⁴⁵ Yet physicians seem unconvinced. The EHR’s flat uptake suggests that

physicians' inertia is attributable to more than a matter of access to capital or a return on investment. Physicians doubt the EHR's quality proposition, and income and workflow disruptions from the EHR might be considerable in clinics with high fee-for-service, one-on-one patient throughput.⁴⁶

What is clear is that once physicians' reluctance is overcome, the EHR's business case will not necessarily be aligned with the nation's interest in lowering costs and increasing quality. As the EHR's installation and maintenance expenses pass to the consumer through increased billings—absent any economic return on efficiency or quality—costs are likely to be accelerated.

PATIENT-CENTEREDNESS, shared decision making, teaming, group visits, open access, outcome responsibility, the chronic care model, and disease management are among the proposals intended to transform medical practice. The EHR's greatest promise arguably lies in the support of these initiatives, versus the prospect of less efficiency, greater cost, inconsistent quality, and unchanged malpractice burdens resulting from a simple engraftment onto the current health care system. Accordingly, policy might be better served by caution, viewing the EHR as less of an established end and more as an inconsistent means of transformation. Finally, additional research is needed on overcoming the EHR's limitations and dependably achieving higher quality at affordable cost.

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