Electronic Health Records and the Quest to Achieve the “Triple Aim”*

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In 2004, President George W. Bush called for interoperable electronic health records (EHRs) for the majority of Americans within 10 years and established the Office of the National Coordinator for Health Information Technology (HIT), directed by Dr. David Brailer, whose Framework for Strategic Action (1) envisioned a consumer-centric, information-rich health care system through adoption of HIT. In 2009, Congress passed and President Barack Obama signed the Health Information Technology for Economic and Clinical Health Act (2). Simply having EHRs was not sufficient; hospitals and providers needed to demonstrate “meaningful” use of the system. David Blumenthal stated, “Congress apparently sees HIT as a means of improving the quality of health care, the health of populations and the efficiency of health care systems” (2), paraphrasing Donald Berwick’s “Triple Aim” of health care reform (3).

In this issue of the Journal, Joynt et al. (4) provide compelling evidence that EHR adoption had no impact on clinical outcomes or measures of quality of care (4). They performed a patient-level regression analysis on 626,473 patients who had an ischemic stroke using data collected between 2007 and 2010 from 1,236 hospitals in the Get With the Guidelines (GWTG)-Stroke registry (of which 511 used EHRs). Hospitals with EHRs had similar in-hospital mortality, adherence to guidelines, and outcomes (discharge to home) and a very slight reduction in length of stay, with 42.4% staying more than 4 days in the EHR group versus 43.9% in the non-EHR group.

We draw 3 significant conclusions: 1) guidelines work; 2) registries are important tools to help achieve the Triple Aim of health care; and 3) as configured and deployed, EHRs have not been shown to help achieve the Triple Aim.

EVIDENCE THAT GUIDELINES WORK. In this study, hospitals that employed GWTG-Stroke (with or without EHRs) demonstrated high levels of quality, adherence to guidelines, and clinical outcomes (4). This and previous publications (5,6) confirm improvements in individual and cumulative quality measures and reductions in mortality and hospital length of stay and that these changes are due to guideline compliance, not simply to better documentation (7). Thus, although adopting the GWTG-Stroke recommendations achieved the Triple Aim, the presence of EHRs added no incremental benefit.

EVIDENCE TO SUPPORT REGISTRY USE. This paper also exposed the power of registries. The American Heart Association’s GWTG program (8) and the American College of Cardiology’s National Cardiovascular Data Registry (9) allow measurements of the outcomes of thousands to more than a million patients from real-world experience, which many statisticians believe is inherently superior to smaller randomized trials (10). Trials of this size raise the question of statistical versus clinical significance. Is there a clinical difference if 42.4% versus 43.9% of patients stay >4 days? That the presence of EHRs did not statistically improve quality or outcomes in this trial is of great clinical importance.

EVIDENCE THAT EHRs DO NOT YET SUPPORT THE TRIPLE AIM. How did we move from a consensus that EHR adoption was core to achieving the Triple Aim (1-3,11) to a large registry study in patients with stroke that showed no quality or safety benefit?
The Rand Corporation, performing elegant modeling studies, extrapolated $81 billion in annual health care savings, such that the United States would have saved $500 billion by 2018 (12). The influential article by Chaudhry et al. (13) synthesizing data on 257 HIT publications stated that “HIT has been shown to improve quality by increasing adherence to guidelines, enhancing disease surveillance and decreasing medication errors.” However, often missed is the subsequent discussion that little evidence was available on how multifunctional commercially developed systems affect quality, efficiency, and cost, and that most high-quality studies of health information technology systems come from 4 benchmark research institutions; however, their work does not easily translate to a larger scale.

In 2009, Zhou et al. (14) “found no association between duration of using an EHR and performance with respect to quality of care.” Himmelstein et al. (15) found that the “most wired” hospitals performed no better than others on quality, cost, or administrative costs. Romano and Stafford (16) found “no consistent association between EHRs and CDS (computerized decision support) and better quality.” Finally, Agha (17) found “no evidence of cost savings even 5 years after adoption.” Thus, it is not so surprising that in the paper by Joynt et al. (4), EHRs failed the Triple Aim.

**THE WAY FORWARD.** We should first advocate for a pause in meaningful use implementation and penalties. Joynt et al. (4) demonstrated that EHRs, as currently implemented, may be incapable of achieving meaningful use. When the fundamental assumptions of meaningful use are flawed, how can hospitals and providers be penalized? Furthermore, the hospitals least likely to achieve meaningful use are smaller, rural, and Joint Commission certified (18). Critical access hospitals are especially at risk (19).

Providers and patients should work with the clinical informatics community and EHR vendors to redraw priorities and timelines. Our research shows that health care providers are not against technology, but HIT does not work for them (20,21). EHRs should be designed to enhance the workflow, communications, and decision-making of providers and the health and safety of patients (22,23). Our work indicates that EHRs should be adaptable to different clinical environments; emergency department physicians want different functionality than cardiologists (24). We need to promote user-centered design and not simply tweak EHRs designed around charge capture.

The American College of Physicians (28) recently outlined the challenges faced by clinicians, making the following strong recommendations: 1) EHR developers need to facilitate longitudinal care for the patient; 2) documentation must support the clinician’s cognitive process; 3) EHRs must support “write once, reuse many times”; 4) EHRs should not require unnecessary documentation steps; and 5) EHRs must facilitate patient-generated data.

Finally, it is time to jettison the biggest barrier to creating a truly useful EHR. We have known for some time that administrative data are a poor substitute for clinical documentation (25–27). An EHR’s first priority must be support of clinical care, not documentation for billing and reimbursement that adds a burden translatable into neither value nor patient health or safety. The work by Joynt et al. (4) is a wake-up call that we should heed.

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