The Quality and IT Revolutions: Anticipated and Unforeseen Impacts

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Abstract

The quality movement has come almost two decades after the prediction that a new era of "evaluation and accountability" will soon revolutionize health care. Health care payers and the US government have decided to measure and publicly report quality. This decision is based on evidence that medical practice in the US only follows best evidence about half of the time, that there are still a lot of medical errors, and that there are clinically indefensible disparities in care across regions and racial and ethnic groups. The Centers for Medicare & Medicaid Services have firmly supported the second trend, which is called pay-for-performance.6

INTRODUCTION

Accurate quality measurement is being supported by solid scientific evidence. The quality movement was built around Donabedian's insight7, which divided quality into three parts: structure (the organization of care), process (the actions taken), and outcomes (the results for the patient). The foundation of it is supported by hundreds of research investigations that have connected certain structures or processes to results that are clinically significant. One example is how the Centers for Medicare & Medicaid Services have taken advantage of these studies to establish new quality of care measures for hospitalized patients with pneumonia. These measures include the time it takes to administer the first dose of antibiotics, whether patients received guideline-concordant antibiotics, influenza and pneumococcal vaccinations, and counseling on how to quit smoking.8

Thanks in part to this quality revolution, computerization is finally about to radically alter medical practice after decades of a snail-like adoption curve. Institutions are realizing the necessity to monitor clinical procedures and results and to encourage clinical research due to the high costs of collecting quality data from medical records and the ineffectiveness of non-systems-based methods for improving performance. Given this context, the purpose of this essay is to assist individuals and organizations in comprehending and better anticipating some anticipated and maybe unexpected consequences of the quality and information technology revolutions.

Impacts of Quality Measurement That Were Not Anticipated

Determining what constitutes brilliance, establishing metrics to measure it, and then analyzing the findings introduces bias into the system. Although it is not always the case,11 varied measures may occasionally trigger gains in unmea-sured areas via basic system reform. In most cases, people and organizations start to stray from other things in order to concentrate on becoming better at the things that are being assessed. Not only is this "playing for the exam" anticipated, but it serves as the exercise's primary objective in some instances.12

To clarify, I'll use a few instances from the UCSF Medical Center, where I work, to make my case. A literature analysis conducted in 2001 indicated that there was virtually little benefit to administering pneumococcal vaccination to inpatients, which contributed to our historically low rate of administration (only 10% in 2003).13 The low pneumococcal vaccination performance rate went from being a fact to an embarrassment once public reporting started, which prompted the institution to make aggressive efforts to improve its rates on this and other publicly reported quality measures. Some intriguing problems have arisen as a result of these initiatives, which are taking place all throughout the US.

To start, the UCSF Medical Center's information system isn't perfect, and it doesn't always record patients' pneumococcal vaccination histories correctly. Historically, doctors were hesitant to vaccinate their patients due to this ambiguity, since they wanted to avoid giving their patients vaccines that weren't required. Now, in most cases, it is not recommended unless the doctor knows for sure that the patient has already had the vaccination.cians via electronic networks.9 That, in addition to the om-CPOE and electronic medical records are quickly becoming the norm in the healthcare industry, because to the pervasiveness of computers in modern life.10 carried out. As a result, a lot of people end up getting more than they need.

The second example is the benchmark of administering the first dosage of antibiotics to a patient with pneumonia within four hours of their admission at the hospital, which is a quality metric. Diagnosing pneumonia, heart failure, pulmonary embolism, or any other possible diagnosis in an emergency room patient presenting with shortness of breath, cough, and infiltrates on chest radiograph might take several hours. Nevertheless, quality measurement also alters the cutoff for first-dose antibiotic administration, frequently convincing clients that the negative outcome for the patient with heart failure who gets antibiotics needlessly outweighs the negative outcome for the patient whose pneumonia turns out to be real (poor performance on the public quality report).

The third example is the widespread use of non-physician case managers to assist institutions in keeping clinicians accountable for publicly monitored care procedures. Case managers at the UCSF Medical Center have been known to inquire about a patient's smoking status or influenza vaccine status before addressing their septic shock or acute myocardial infarction, all in the name of measuring processes. Vaccinating inpatients against pneumococcal disease may be a good quality indicator, but it is far from the most pressing concern for a critically sick patient with pneumonia.

The patient with multiorgan system illness, which is common among hospitalized patients and many older outpatients, further confounds the present science of quality measurement. In an article describing a hypothetical 79-year-old woman with five common diseases—hypertension, osteoporosis, osteoarthritis, type 2 diabetes mellitus, and chronic obstructive pulmonary disease—Boyd et al.14 demonstrated the difficulty of applying today's quality measures for these patients. There are over twenty possible drug-disease, drug-drug, and drug-diet interactions among the thirteen medications this woman would have taken if she had been treated according to guidelines, which would have cost over $5,000 annually.14 Even if following clinical standards would have hurt or bankrupted this patient, the doctor who prescribed this polypharma would still get a good grade on quality measurement criteria.

Complexity and multisystem illness are at the heart of the quality movement's detractors among doctors. One component of high-quality treatment may include giving pneumococcal vaccine and the right medications to individuals who have pneumonia. On the other hand, some doctors manage to provide exceptional care to patients while sometimes forgetting these treatments, even when they are dealing with a wide range of clinical, ethical, and psychological issues. In what ways is it possible to fix this issue? The field of quality measurement science first Assurance needs to develop to the point where it can evaluate the efficacy of treatment for individuals coping with several diseases. The second point is that there are other important areas where clinicians should be evaluated. These include their ability to treat patients with multiple organ failure, their teamwork skills, their ability to perform procedures safely, and other related areas. Other indicators could be their performance in simulated patient scenarios or their maintenance of board certification.the number of

Potentially Unanticipated Results of Computerization

Computerizing health care, and more specifically the prescription process, was universally favored in the early literature.17, 18 Nevertheless, the majority of these investigations took place in a few of institutions that invested decades into developing their own computer systems and employed administrators, researchers, and doctors who firmly believed in the systems' worth.19 When less dedicated institutions started using off-the-shelf technologies, the real test began, and there have been several stories of unanticipated repercussions since then. Some examples of these errors include doctors choosing the wrong drugs from computerized lists and a near-injection of insulin into a non-diabetic patient whose wrist-band was mistakenly linked to a diabetic patient's (the computer faithfully listed the diabetic patient's bedside glucose test results under the non-diabetic patient's record).20,21 The implementation of a popular commercial computer system was associated with a threefold increase in mortality among critically sick

children, according to a recent research. This rise was mainly explained by altered clinician workflow patterns.22 Rather of tending to patients' needs at the bedside, medical professionals were compelled to spend long periods of time in front of computers.

Similar to how the first writings on computerization were too optimistic, the current body of material may be too pessimistic. When introducing a system as intricate as CPOE, problems are certain to arise; yet, overcoming these obstacles could lead to betterment in the end. Clinicians, health care organizations, regulators, payers, and vendors must recognize the drawbacks of badly designed systems and work together to improve them quickly so that any damage during the transition is minimized, rather than putting a halt to computerization. Here, computerization is comparable to resident duty hours requirements; both may increase the number of hand-offs and reduce safety in the near run, but as these transitions are smoothed out, patient and resident well-being will surely improve.

In the realm of information technology, the issues that plagued Cedars-Sinai Medical Center in Los Angeles, California, when it implemented a costly in-house CPOE system, have become legendary among health care organizations' computer implementation troubles. Not long after the CPOE system was live in late 2002, doctors were almost begging for it— would go off if the power was left on.23 The issue was found to be related to the decision support layers, which caused doctors to go through many "Are you sure?" displays before the computer would approve orders for drugs like vancomycin. The $34 million system was abandoned due to physician pushback; a successor system was still not implemented three years later. Instead, Cedars-Sinai Medical Center supplemented its workforce to ensure that physician instructions were double-checked. This same hospital's VP of medical affairs bemoaned the fact that "we trap potential mishaps" in 2005. "However, technology might make that process more efficient."24

A cautionary story regarding the requirement of gaining physician buy-in and ensuring that CPOE does not sacrifice efficiency has been constructed using the Cedars-Sinai Medical Center experience. Another, more basic, perspective is that it is a challenge for any healthcare organization to ensure that all of its doctors follow evidence-based procedures since they all work in an environment where quality is evaluated, reported publicly, and maybe even paid for. The unique capacity of computers to impose this control could become the focal point of clinician-institutional conflict as the stakes rise (for example, from basic transparency to pay-for-performance), and institutions will feel increasing pressure to exert central control over physicians' practices. Doctors will fight back against attempts to limit their clinical autonomy by claiming that their patients' specific needs and their own unique body of knowledge need choices that deviate from established protocols.

Finding a balance between being overly prescriptive and causing "alert fatigue," crippling inefficiency, or physician backlash is a difficult balancing act that the individuals or organizations tasked with integrating decision support and guidelines into computerized systems will have to master. Systems must ensure that doctors may still use their artistic license to treat patients who do not conform to the templates, such as those with complex illnesses affecting many systems or whose disease courses are changing at a fast pace, until quality assessment and guideline formulation become more refined fields of study.

The lesson that hospitals may learn from the Cedars-Sinai Medical Center disaster is that rushing to implement decision assistance could cause a backlash, which in turn might derail a whole project. Is there any question that central control of physicians' practice will need to be exercised, especially when there is evidence of substandard performance on publicly reported measures? This is even if this lesson drives administrators and decision-makers to create kinder, gentler CPOE (at least during the implementation phase). It would be a mistake to make systems too invasive, but it would be just as wrong to let doctors provide subpar treatment when better care could be guaranteed electronically. Finding a happy medium between the two extremes will be a challenge that requires Future and Present Great Doctors

Decades ago, the ideal of a brilliant doctor was engraved on the minds of both patients and doctors: a gifted diagnostician who skillfully performed medical procedures with the help of others who blindly followed "orders." According to Wolfe's account in The Right Stuff,25 the first test pilots saw themselves as fiercely autonomous, rule-breaking, daring cowboys who were praised for their exceptional abilities and bravado. Wolfe adds that there was

one little issue with flying at that time: a quarter of the pi-lots died since so many of their aircraft crashed and burned.25

From Chuck Yeager's gunslinger character to John Glenn's (later an Ohio senator) radically different sort of persona, The Right Stuff follows the development of the perfect pilot. Engineer and Eagle Scout Glenn was a stickler for rules, protocols, checklists, and safety measures. Yeager and his colleagues were right to be concerned that piloting a plane would become far less thrilling as the industry underwent this transformation. Still, flying got a lot less dangerous for everyone involved.

Computerized decision support guides the physician to do the right thing even when memory fails, when the to-do list becomes overwhelmingly long, or when distracted by personal issues; this is in addition to the physician's excellence, which is essential for delivering evidence-based, reliably safe health care. The involvement of doctors in the development and maintenance of such systems is crucial to their success.26

Some may think that doctors who work on quality and safety systems are preparing for their own demise; they are trying to make themselves into a commodity so that their services are replaceable. The argument goes something like this: any doctor can follow a set of computer-generated directives. As pilots contributed to the development of safer systems and protocols, the quality of the individual captain became less important than the system as a whole, and pilots were essentially interchangeable. This trend continued into modern aviation, where it is extremely unlikely that any pilot would have a crash during a 30-year career.27 Some are concerned that today's pilot salary cutbacks and job losses could have their roots in this commoditization. Some worry that standardization and computerization may encourage alternative models to emerge that do not include doctors or will lead to the outsourcing of medical services.28, 29

The primary goal should be to develop systems that are safer, more effective, and of higher quality for both patients and doctors. In the future, a well-oiled health care machine will likely use repetitive, algorithmic procedures (like pneumococcal vaccination administration) example, evidence-based antibiotic choice for pneumonia) are handled by a user-friendly computer system that is reasonably non-intrusive and equipped with the required recommendations. Each practice is accompanied by supporting data. It is important that these systems understand clinical workflow, provide appropriate overrides when needed, and do not hinder or even enhance the productivity of doctors.

The provision of care to patients with complicated multidimensional illnesses, the expert execution of procedures, the compassionate application of ethical decision-making, patient counseling, care coordination, and palliative care—these artistic endeavors should continue to enrich physicians' work even in the presence of an ideal system. To achieve health care's ultimate goals, it is crucial to move toward a system where patients may reliably obtain safe, high-quality treatment. Better patient care and improved health outcomes are the intended implications of the quality and information technology revolutions, but there will be obstacles and unanticipated effects along the way.

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