

hard-working people, including physicians. But a strategy anchored in value is inherently good for both patients and the professional satisfaction of those who care for them.

Strategy demands leaders willing to make these choices, drive their execution, and bring the organization along. Leadership in health care organizations has

tended to be more about stewardship than choices, and leader selection has often been based on research credentials, leaving the clinical enterprise reliant on momentum and reputation. But future success depends on the ability of organizations to create value for patients. Leaders must ensure that all activities are aligned around this goal. In the emerging

competitive marketplace, only organizations that truly understand strategy will thrive.

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## Virtual Visits — Confronting the Challenges of Telemedicine

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Traditionally defined, telemedicine is the provision of medical care remotely by means of audiovisual technology. Using such technology, clinicians can examine patients and make treatment recommendations across long distances. Telemedicine is by no means a new concept — varieties such as teleradiology and telepathology that rely on “store-and-forward” techniques, in which images are captured and sent to a different location for later evaluation, have been around for more than 30 years. But technological advances including high-resolution video cameras and stable broadband Internet have helped make real-time telemedicine an increasingly common mode of health care delivery in such diverse fields as dermatology, neurology, and intensive care.<sup>1</sup> The fact that in 2012 nearly half of U.S. hospitals reported having active telemedicine programs indicates that telemedicine is now fully within the mainstream.<sup>2</sup>

This dramatic expansion has profound implications for the health care system. Most important, telemedicine has the potential to substantially expand access to high-quality health care, overcoming not only geographic but

also socioeconomic barriers to care. Just as neurologists can use telemedicine to treat a patient for stroke in the emergency department of a far-off rural hospital, primary care physicians can use it to treat nearby patients who have difficulty visiting a clinic, such as nursing home residents or patients with disabilities. In all these cases, telemedicine does more than just enable health care delivery across distances: it facilitates a kind of community-based care, improving access by making health care more convenient for both patients and providers.

Telemedicine also has the potential to substantially reduce health care costs. For providers, using telemedicine may be more efficient than seeing patients in brick-and-mortar offices, since it reduces the time and space needed to run a medical practice. For patients, telemedicine can reduce travel expenses and the opportunity costs associated with obtaining care, such as missed hours or days of work. For payers, it has the potential to reduce reimbursements because of reductions in overall utilization. For example, in the emergency-department setting, telemedicine may allow specialists in regional referral centers to remotely treat acutely ill patients

with complex conditions in rural hospitals, saving the costs of transport and a second emergency-department visit.

Despite the many ways in which telemedicine may transform health care for the better, it faces a number of major challenges along the way. First, there are enduring concerns about its effectiveness and cost-effectiveness. The aforementioned benefits are theoretical, and the actual data to date are far from convincing. Most studies of telemedicine are methodologically weak before-and-after studies that rarely examine patient-centered outcomes, instead focusing on feasibility and acceptability to patients.<sup>3</sup> Although these aspects are important, they are not the same as — and may not correlate with — patient-centered outcomes such as mortality and functional status. Given these limitations, the existing literature does not settle the issue of whether telemedicine delivers the same outcomes as face-to-face encounters at either the same or lower costs.

Second, even in areas where effectiveness data are available, the influence of telemedicine varies greatly depending on where and how the technology is applied. For example, studies have shown that intensive care unit (ICU) telemedi-

cine can reduce mortality among patients receiving critical care by 15% by expanding access to trained intensivists.<sup>4</sup> However, whereas some programs substantially reduce mortality, others have little or no impact.<sup>4</sup> Published studies do little to explain this heterogeneity or offer insight into how programs can become more effective. Without clear evidence regarding when and where telemedicine is most effective, we risk wasting scarce health care resources on ineffective programs.

Third, the legal and regulatory infrastructure for telemedicine has yet to catch up with the technology, which changes on a near-daily basis. Yesterday's telemedicine was basically just traditional face-to-face visits conducted using video cameras. Regulatory challenges such as liability, cross-state licensing, and cross-hospital credentialing, although not trivial, were at least predictable. Tomorrow, patients will expect more, and the technology will be there to provide it, including on-demand health care delivered through smartphone applications that transcend state and even national boundaries. The current regulatory environment erects multiple barriers to informal, distance-based care and is poorly equipped to keep pace with such rapid changes.

Fourth, we don't yet understand the potential unintended consequences of telemedicine. Some of these consequences will be financial: even if a telemedicine encounter is more efficient than a face-to-face encounter, to the extent that telemedicine leads to more encounters overall, health care costs will increase. Other, more subtle, potential unintended consequences are related to the complex interpersonal and interprofessional relationships that define our profession.<sup>5</sup> In hospital settings,

telemedicine forces nurses to take orders from physicians they may never have met, challenging traditional conceptions of teamwork and collaboration. In both hospitals and ambulatory settings, telemedicine forces patients to accept medical advice without the benefit of an in-person encounter to build trust and rapport.

More broadly, telemedicine forces us all to reconsider what it means for a doctor to "see" a patient, changing the physician-patient relationship in unpredictable ways. Disruptive technologies are just that — disruptive. No one can say for certain where they may take us. Consider the smartphone dating application Tinder: it allows users to rapidly sort through hundreds of potential dating partners on the basis of little more than a photograph, making matches when both users indicate an interest. Tinder makes dating quicker, efficient, and more accessible. But is it better?

The task for telemedicine providers will be to tackle these challenges head-on. We need more research demonstrating that telemedicine improves patient-centered outcomes and that it can do so efficiently — not just for individual encounters but at the population level, without leading to overuse. Researchers should explore the crucial issue of context, studying not only whether telemedicine works but also how, when, and where it works best, to provide a roadmap for more effective implementation. We must also study how to integrate telemedicine into the existing care system in ways that do not detract from the interpersonal and interprofessional relationships that we all recognize are essential to effective, patient-centered care. As we perform this research, we also need to revise — and perhaps complete-

ly rethink — health care regulations, putting into place a more flexible system that can protect patients while fostering continued innovation.

Telemedicine will almost certainly expand in the coming years. As health care becomes more consumer-driven, tech-savvy patients will want more flexibility in how they seek care. And as health care becomes more value-oriented, accountable care organizations and other integrated health care providers will increasingly rely on technology to improve efficiency. Telemedicine is uniquely positioned to address both of these needs. But in solving some problems, telemedicine will surely create others. Our job is to minimize the potential harms by insisting that implementation of telemedicine is based on solid data. That way, it can lead to health care that is not just different and more modern but also better.

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