

Perspective

Beyond the COVID Pandemic, Telemedicine, and Health Care

Rashid L. Bashshur, PhD,¹ Charles R. Doarn, MBA,²
Julio M. Frenk, MD, PhD,³ Joseph C. Kvedar, MD,⁴
Gary W. Shannon, PhD,⁵ and James O. Woolliscroft, MD¹

¹University of Michigan, Ann Arbor, Michigan, USA.

²Department of Environmental and Public Health Sciences,
College of Medicine, University of Cincinnati, Cincinnati,
Ohio, USA.

³University of Miami, Coral Gables, Florida, USA.

⁴Harvard University, Boston, Massachusetts, USA.

⁵University of Kentucky, Lexington, Kentucky, USA.

Abstract

This article reviews the current experience and the flaws encountered in the rush to deploy telemedicine as a substitute for in-person care in response to the raging coronavirus (COVID-19) pandemic; the preceding fault lines in the U.S. health care system that exacerbated the problem; and the importance of emerging from this calamity with a clear vision for necessary health care reforms. It starts with the premise that the precursors of catastrophes of this magnitude provide a valid basis for planning corrective measures, improved preparedness, and ultimately serious health reform. Such reform should include standardized protocols for proper deployment of telemedicine to triage patients to the appropriate level and source of care at the point of need, proper use of relevant technological innovations to deliver precision medicine, and the development of regional networks to coordinate and improve access to care while streamlining the care process. The other essential element is a universal payment system that puts the United States at par with the rest of the industrialized countries, regardless of variation among them. The ultimate goal is creating an efficient, effective, accessible, and equitable system of care. Although timing is uncertain, the pandemic will be brought under control. The path to a better future after the pandemic offers some consolation for the massive loss of life and treasure during this pandemic.

Keywords: telemedicine, telehealth, pandemic, health care, health economics

Introduction

Practically every major health crisis impacting masses of people carries the seeds for health care reform because such events reveal the precipitating fault lines that preceded and contributed to the disaster. For those concerned and insightful, such events present unique opportunities to investigate and develop improved preparedness strategies and a better plan going forward. But the actual benefits would accrue only if the correct lessons are drawn from the difficult experience just passed, and there is a political will to embrace genuine reform. The current situation with the coronavirus (COVID-19) pandemic is no exception.

One of the key responses to this pandemic in health care has been large-scale deployment of telemedicine as a substitute for in-person care throughout the country and worldwide. This was aimed at achieving the triple objectives of (1) caring for the influx of infected patients requiring isolation and intensive care, (2) continuing to care for customary patients, and (3) protecting providers and patients from infection. From all indications to date, all three objectives were met, and telemedicine became a household word in record time.

The vast majority of clinicians started using telemedicine with minimal planning or preparation. In this context, it is likely providers and patients have encountered avoidable problems and missteps, as well as positive experiences. Absent robust large-scale clinical trials to ascertain the effectiveness and efficiency of telemedicine in specific configurations of clinical interventions, applications, technological structures, logistics, and contextual settings, we would be left with circumscribed and/or anecdotal information not conducive to optimal policymaking or planning. Without this type of detailed information, we run the risk of viewing telemedicine primarily as a stop gap response to the exigencies created by the pandemic whose value would recede after the crisis. There is also the potential for ignoring whatever imperfections were encountered during the pandemic and depicting telemedicine as a panacea, or an opportunity for profit making. One recent publication focused on the universal utility of telemedicine and its integration into the health system.¹

Our purpose here is to explore these issues and to provide a basis for planning a better future.

The massive disruptions caused by the COVID-19 pandemic have exacerbated prevailing inadequacies in the U.S. health care system. These include limited access to care for segments of the population, systemic inefficiencies and ineffective care, unabated cost inflation, as well as an antiquated payment system and increasing numbers of people left without access to quality care due to economic, geographic, or cultural reasons. As time goes on, these failures are likely to become more acute, as the country will be faced with depleted public funds, which were heavily committed to support the economy and the health sector prompted by the crisis. There will likely be pressures on the health system to deliver more value or services with fewer resources while also facing financial challenges and physician shortages in several specialties. The need for improved efficiency, productivity, and equity will increase, and better results cannot be expected from the very approaches that resulted in these failures.

Postpandemic Telemedicine

It is too early to reach definitive conclusions regarding results of the current experience with telemedicine during the crisis. Indeed, given the prevailing pressures, attention has focused on issues already established in the scientific literature, namely feasibility, acceptance, and implementation problems. This falls short of in-depth examination of telemedicine's unique role in the medical care process and outcome, ranging from prevention, case finding, diagnosis, treatment, monitoring and follow-up, and palliative end-of-life care.

Emergency Fix or Generational Shift

For the vast majority of current users, both providers and patients, telemedicine has been a novel experience. They embraced it as a necessity, not necessarily a choice. Some providers were pleasantly surprised to find that videoconferencing can serve as an effective substitute for in-person clinical encounters. Few were dubious about losing the ability to observe subtle signs and symptoms and the personal connection with their patients. Patients were generally pleased with ready access, convenience, and infection risk avoidance.

In a longer view, it is not yet clear whether the phenomenal pace that marked the substitution of telemedicine for in-person care will be a generational change comparable with physicians no longer visiting patients in their homes. That change was gradual, sporadic, and slow. It was the culmination of factors, including scientific advances that enhanced our understanding of health and disease, the proliferation of sophisticated diagnostic and therapeutic options, and the advent of medical specialization that rendered the home visit

an inadequate substitute for clinical or hospital evaluation and treatment. The current shift to telemedicine has been sudden and large scale, necessitated by a raging pandemic.

We can only speculate as to whether the current deployment of telemedicine will continue at the same pace or diminish if and when the restrictive regulations that prevailed before the pandemic were reinstated in part or in total, or, more importantly, whether serious steps are taken to integrate telemedicine into a broader plan of health care reform. However, we can anticipate that the wider use and heavy dependence on the underlying electronic technology in all sectors of society—including education, commerce, industry, transportation, entertainment, and communications—will ensure its continuing use in health care in one form or another.

Suboptimal Telemedicine Is Suboptimal Care

The rush to deploy telemedicine carries risks of unintended consequences, including substandard care. From past experience, nonequivalence in consult content and outcome may vary by provider's relevant experience, medical specialty, and technological sophistication. In the current situation, the typical telemedicine visit may not elicit or contain the same detailed medical history, previsit measurement of vital signs, or observations of subtle signs and symptoms during the visit and pre- and postencounter tests.

During the pandemic, suboptimal care through telemedicine may be defined as any infringement related to several dimensions that affect the quality of care received by the patient. A review of relevant dimensions is presented as follows.

Information Content

For optimum quality, telemedicine encounters require synchronous audio-video communications system for two-way interaction between clinician and patient. However, during the current emergency, some states permitted "telehealth" encounters to be conducted through audio only. This limitation may compromise quality in certain applications. In contrast, during this particular pandemic, the use of audio only has facilitated the provision of care for segments of the population who have neither broadband nor smart devices. In addition, in some states, telemedicine may be employed only with the consent of the patient. Although in this emergency, few if any would not agree.

Lack of Technological Familiarity/Experience

Telemedicine encounters are unique by virtue of the degree of reliance on technology. Hence, the quality of the encounter

is affected by familiarity with the medium of communication and the protocols that are implemented. Both patient and provider are projecting an image to the other that affects the quality of the interaction. For example, a provider's image on the screen may reflect dispassion by looking distracted or not looking directly at the patient. The same applies to patients. The rush to deploy telemedicine has preempted serious attention to such detail as well as the standardization of infrastructure, staffing, work flow, protocols, and logistics. Hence, some of the observed differences in quality outcomes in this situation may be explained by exogenous variables rather than telemedicine *per se*.

Technology Reliance

Reliance on technology in and of itself is a complicating factor in the provider-patient relationship. Physicians, nurses, and other health and medical personnel are not equally trained/experienced in fully utilizing the technological capabilities available to them. Thus, the development and continued application of telemedicine has spawned the need for a third major personnel cohort necessary for the success of each consultation as well as the functioning and maintenance of equipment and networks. A successful telemedicine consult may be more complex than a traditional office visit because we have not developed and disseminated the requisite protocols in all aspects of the clinical encounter. Thus, it is essential that one focus be directed toward the assessment and development of a telemedicine template appropriate for emergency situations such as pandemics and natural disasters, including hurricanes, earthquakes, and floods. However, this cannot be the sole focus.

The other critical focus is medical care in all its facets, including health promotion/disease prevention, primary and specialty care, management of chronic illness, and routine emergencies. Indeed, for the past several decades, evidence-based telemedicine applications have been assessed as clinically and cost-effective for major chronic diseases, primary care, diagnostic services, and mental health. This has resulted in an ever-increasing acceptance and clinicians trained in its use.

The Rural Hospital and Clinic

One of the unintended consequences of the wider use of telemedicine is the potential threat to the stability of rural hospitals and clinics, including critical care hospitals. These are essential resources for residents of rural and remote areas. If certain forms of telemedicine end up competing for patients in those areas, the loss of patients would compound the financial challenges of those with less resources. Already many rural hospitals have closed their doors long before the pan-

demic. Now, their situation is more precarious because of it. Their closures would place special burdens on the local population, whose members would find themselves postponing or foregoing necessary care. In contrast, when used in collaboration with large urban centers in regional networks, telemedicine offers rural hospitals the opportunity to provide specialty service to residents in their service areas, thus retaining their patients. Regionalization offers a hierarchical structure for efficient distribution of shared health resources for the benefit of all residents within the region.

Concluding Remarks

The transition to telemedicine occurred in response to the rapid spatial-temporal diffusion of the COVID-19 pandemic. It has been spontaneous and dramatic, providing little or no time for deliberate planning or preparation. This anomalous situation is likely to have entailed errors of omission and commission. Errors and their attribution are not likely to become manifest until sometime after the end of the crisis. To date, the restrictive rules regarding reimbursement, interstate licensing (although not adhered to by all states), patient location, confidentiality, and technological configurations had to be set aside to promote the wider use of telemedicine. In the future, states are not likely to relinquish control over medical licensing, and CMS is not likely to support unbridled access to care. Hence, there is little doubt that some of these suspensions will not expire with the termination of the emergency, but some revisions are nearly certain.

There are several reasons for this optimism. These include (1) near universal dependence on this technology in nearly all sectors of society, including remote work from home, education, commerce, industry, entertainment, social interaction, and others; (2) an existing large body of empirical knowledge that attests to the merit of telemedicine interventions in preventive and primary care, chronic disease management, diagnostic services, mental health, and several other health applications; (3) an acute public awareness of its immediate benefits during this crisis; and (4) new positive attitudes among clinicians who experienced it firsthand.

In any case, the sole focus on assessing the success of telemedicine in a crisis situation carries the risk of casting this modality of care as appropriate for emergency or disaster situations only. This would be unfortunate and short sighted. Ideally, we would emerge from this bitter experience with a clear vision of an appropriate, tailored, and effective use of telemedicine embedded in a more efficient, equitable, and accessible health care system, a system that employs the tools of telemedicine together with other relevant technological innovations to deliver precision medicine to those in need

within organized regional systems of care. The heavy investment in the electronic medical record has proven its worth during the pandemic as a necessary tool for continuity, integration, and quality control.

Our purpose here was to provide a sober reflection on the current experience with telemedicine, the systemic fault lines that preceded the pandemic, and better path forward. If history is any indication, preventive and therapeutic measures will be developed for novel corona virus, although precise timing is uncertain. When this crisis ends, we will be faced with a historical cross-road that will not be limited to how telemedicine will be integrated into mainstream medicine but, more significantly, whether we will embrace a superior health care system that aims to provide precision medicine at the point of need for all those who require care regardless of residential location or ability to pay. To achieve this level of effectiveness, efficiency and access the new systems will have to employ not only the tools of telemedicine but also all the relevant technological innovations, including artificial intelligence, data mining, nanotechnology, sensors, and robotics to deliver the right care at the point of need.

These technologies augment the skills of clinicians, reduce medical errors, and enhance diagnostic and treatment effectiveness and precision. The other essential element is comprehensive reform of the byzantine payment system.

The ultimate goal of the new health system must be to promote the use of service when appropriate and discourage

it when not appropriate through a formal and explicit triage system within organized regional systems of care. This will allow us to emerge from this unprecedented trauma with gains.

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Address correspondence to:

Rashid L. Bashshur, PhD

University of Michigan

1383 Esch Court

Ann Arbor, MI 48104

USA

E-mail: bashshur@med.umich.edu

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