

The Evidence Base for Telehealth: Reassurance in the Face of Rapid Expansion During the COVID-19 Pandemic



Introduction

In a very short time, healthcare in the United States and in many other countries has been transformed out of necessity to respond to the COVID-19 pandemic. Herculean efforts have supported transformations ranging from converting hospital spaces and non-healthcare facilities into intensive care units (ICUs) to rolling out new clinical guidelines and policies. One of the most evident, and perhaps impactful, changes has been the explosion of telehealth. For example, at Oregon Health & Science University, the number of digital health visits ballooned from 1,100 in February to nearly 13,000 in March, and all 1,200 ambulatory faculty were able to conduct virtual visits by April 3, 2020.¹ This response has been fueled by necessity and rapid legislative and regulatory changes to payment and privacy requirements, particularly the temporary waivers and new rules by the Centers for Medicare & Medicaid Services that have broadened access and facilitated payment² for a wider range of telehealth services.^a

Many are heralding the rapid expansion of telehealth as both a solution to current problems and an innovation whose time has come.³ Telecommunications technology can provide or support healthcare delivery across time and/or distance, expand access, facilitate exchange of information, and deliver care in alternate formats. For example, “remote patient monitoring” helps manage chronic conditions, and “remote ICUs” allow care for critical patients at a distance; with telehealth, care can be extended to remote areas and psychiatric counseling and treatment can be facilitated in the privacy of the patient’s home. Others point out that telehealth has inherent limitations, and the rush to alternatives to in-person care could exacerbate health disparities and increase risks of compromising personal health or other information.⁴⁻⁶ Potential reasons for these differences in viewpoint include: the challenge of separating the impact of telehealth, an approach to care delivery, from the quality of care regardless of how it is delivered; the wide variation in contexts in which telehealth has been implemented; and the overall lack of rigorous and detailed telehealth studies.

With funding from the AHRQ Effective Health Care Program, the Pacific Northwest Evidence-based Practice Center produced two reports on telehealth: (1) in 2016 an evidence map on the impact of telehealth on patient outcomes⁷ and (2) in 2019 a systematic review of the

^aCMS News Alert April 13, 2020. www.cms.gov/newsroom/press-releases/cms-news-alert-april-13-2020; CARES Act: AMA COVID-19 pandemic telehealth fact sheet. April 27, 2020. www.ama-assn.org/delivering-care/public-health/cares-act-ama-covid-19-pandemic-telehealth-fact-sheet

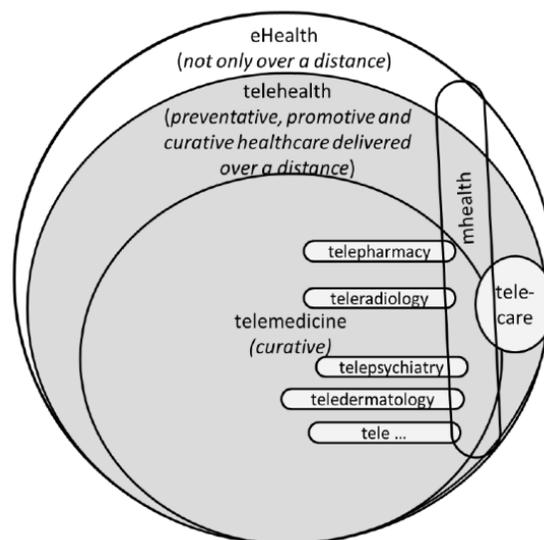


evidence about telehealth for acute- and chronic-care consultations.⁸ In this commentary, we summarize evidence on selected topics from these reports that may be relevant in the context of the response to the COVID-19 pandemic.

What We Know From the Evidence Base

Telehealth, telemedicine, and ehealth are a few of the many overlapping terms and uses for telecommunications in health. This complexity is represented in Figure 1. Our work started with an evidence map as a means of first identifying and then organizing the available telehealth research in terms of what was already known and what required additional research.

Figure 1. Scope of telehealth terminology^a



^a Figure reprinted from *A Review of Telehealth Service Implementation Frameworks* by van Dyk⁹ under the terms and conditions of the Creative Commons Attribution license (<https://creativecommons.org/licenses/by-nc-sa/3.0/>)

In [Telehealth: Mapping the Evidence for Patient Outcomes from Systematic Reviews](#)⁷ we provided an overview of the research evidence on telehealth based on data from 58 systematic reviews published between 2007 and 2015, which included over 950 studies of telehealth. Using an evidence map, a type of abbreviated review,¹⁰ we presented the telehealth modalities (e.g., video, asynchronous), clinical topics (e.g., chronic disease management), telehealth function (e.g., remote patient monitoring, consultations), number of patients, and an indication of whether results from each review suggested benefits for patients. High-level findings that may be useful to consider in the current context include:

- Telehealth is beneficial for specific uses and patient populations. There is a large volume of research reporting that clinical outcomes with telehealth are as good as or better than usual care and that telehealth improves intermediate outcomes and satisfaction.
- The evidence of benefit was concentrated in specific uses. Specifically, we found that a large body of research supports the use of telehealth for:

- Remote, home monitoring for patients with chronic conditions, such as chronic obstructive pulmonary disease and congestive heart failure
- Communicating and counseling patients with chronic conditions
- Providing psychotherapy as part of behavioral health

Our second report, [*Telehealth for Acute and Chronic Care Consultations*](#),⁸ built on the evidence map and synthesized evidence from research published between 1996 and May 2018 on the use of technology to facilitate collaboration among clinicians across time and/or distance. Based on findings in this report we are able to provide some overall conclusions relevant to telehealth expansion during the COVID-19 crisis.

As hospitals face potential shortages of space and staff to care for a possible surge of critical patients, remote ICUs may help efficiently deploy specialized staff. Remote ICUs allow intensivist physicians or teams including nurses and other staff to monitor and direct care for critically ill patients in other locations. Remote ICUs have been used both to provide specialized critical care coverage for nights and weekends, compared with weekdays only, and to provide intensivist management to locations without these specialists. Twenty-one studies evaluated remote ICUs and consistently reported lower, statistically significant inpatient and ICU mortality rates and small, nonsignificant reductions in length of stay. One caveat is that only one study specifically addressed adverse events, reporting lower rates of complications with remote ICUs. We identified these key findings related to implementation of remote ICUs:

- Targeting is important. Mortality reductions were seen in sicker patients when remote ICUs were employed, while there were no differences when patients were less critically ill.
- The effects may be from a remote team acting together. All remote ICU studies included a physician intensivist, all but one included nursing, and half included administrative support.

Telehealth consultations have been used to support emergency medical services (EMS), urgent care, and emergency departments. Across 22 EMS studies and 19 emergency department studies, emergency telehealth consultations improved triage by decreasing the time to decisions about transport and treatment and ultimately to patient receipt of care. In the current situation, reducing the time patients spend in the emergency department may help to reduce risk of exposure. While these studies did not provide extensive detail on the telehealth specifications, a common element was:

- Impact occurs when speed matters. Systems that allowed images or data (e.g., electrocardiogram [EKG], electroencephalogram [EEG]) to be quickly shared and interpreted produced positive results. Fewer heart attack patients died when consultations based on transmitted data were provided to EMS personnel in the field or during transport, and it is plausible this could be generalizable to emergency care of patients in respiratory distress, given that measures of respiration and oxygenation are the first step in current trauma triage,^{11,12} although this has not been studied.

In early research, outpatient telehealth provider consultations were predominantly used to replace sending a patient for an in-person visits with a specialist. In the current pandemic,

telehealth consultations have the added advantages of supporting physical distancing while enhancing the efficient use of physicians and other healthcare providers when availability is even more restricted. Across clinical topics, outpatient telehealth consultations consistently improved access and reduced the number of visits and hospital admissions, and some studies reported improved clinical or psychiatric outcomes. Patients were generally more satisfied with the results of telehealth consultations, due to saved time or expense and reduced travel. Looking across the wide range of applications in outpatient care, a consistent finding is:

- Context matters. In these pre-COVID-19 telehealth studies, benefits were seen in situations where patients and clinicians had a choice, or where telehealth addressed an access issue. The current environment and expectations and goals of both patients and providers are very different, making it likely outcomes will be different.

These key points highlight a small number of clinical applications and selected research in telehealth. Results that are not as topical or for which there was either no evidence or insufficient evidence to support a conclusion can be found in the full reports.



What This Means

The available evidence cannot promise that telehealth will solve the complex problems the healthcare system faces. However, it is reassuring that most of the research evidence available before the current pandemic demonstrates that telehealth can benefit groups of patients when used for telehealth can expand critical care, speed emergency care decisions, and replace much face-to-face care, which now has an added benefit of reducing exposure to infection.

The rapid expansion of telehealth presents opportunities to generate better evidence in two key ways. First, we may be able to address outstanding questions about *how* to do telehealth rather than *whether* to do it for applications where there has been sufficient evidence of effectiveness, but limited research on implementation. Second, based on our reviews of the pre-COVID-19 crisis literature, we suggest that the research evidence about telehealth would be more useful for practice and policy decisions if the data and studies were better. Specifically, future research should:

- Clearly define telehealth interventions and the context in which they are implemented so they can be compared across studies and replicated by others, including details on usual or alternative models of care used for comparison
- Explore in more detail what types of visits and conditions are and are not appropriate for telehealth, particularly given rapid innovations in telehealth that could expand applications.
- Select appropriate outcomes—those that are clinically important and linked to the intervention, instead of those that are most easily measured
- Focus telehealth effectiveness research on clinical applications with limited prior evidence but rapid expansion during a pandemic (e.g., primary care and pre and post surgical visits)
- Include economic assessments that use rigorous methods to measure and analyze costs

- Include more multisite studies rather than relying on pre-post data from a single site and more studies in private, public and military health systems
- Focus on implementation specifics (e.g., technical assistance needs staffing models, etc.) from organizations with varied experiences adopting or expanding telehealth for a range of uses (e.g., from primary to critical care, and postacute and long-term care) in response to COVID-19
- Assess possible models for sustaining and funding readiness for tele-critical care and use of telehealth as part of organizational responses to pandemics or other crises
- Conduct studies of telehealth in the context of newer care delivery and reimbursement structures, such as accountable care organizations

The explosion of telehealth is being driven by need and supported, at least in part, by research evidence. The available evidence can help inform how we can apply telehealth wisely, while rapid adoption in a crisis provides opportunities to learn more, adding to the evidence base about telehealth. In addition to the results summarized above, our reports also highlight gaps in the evidence that could be addressed by new research, such as that which will be supported by AHRQ ([Novel, High-Impact Studies Evaluating Health System and Healthcare Professional Responsiveness to COVID-19](#)) and others.

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Disclaimers

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Afterword

The Agency for Healthcare Research and Quality (AHRQ), through its Evidence-based Practice Centers (EPCs), sponsors the development of evidence reports and technology assessments to assist public- and private-sector organizations in their efforts to improve the quality of healthcare in the United States. The reports and assessments provide organizations with comprehensive, science-based information on common, costly medical conditions and new healthcare technologies and strategies.

The EPC Program has identified existing evidence reports that can help the healthcare field care for patients during this global pandemic. Because these reviews were developed prior to the COVID-19 pandemic, the EPC Program has commissioned a white paper commentary to contextualize the findings to the current situation and inform decision making.

If you have comments on this White Paper Commentary they may be sent by mail to the Task Order Officer named below at: Agency for Healthcare Research and Quality, 5600 Fishers Lane, Rockville, MD 20857, or by email to epc@ahrq.hhs.gov.

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