Enhancing patient engagement during virtual care: A conceptual model and rapid implementation at an academic medical center

Malathi Srinivasan, MD, Anuradha Jayant Phadke, MD, Donna Zulman, MD, Sonoo Thadaney Israni, MBA, Evan Samuel Madill, MD, Thomas Robert Savage, MD, Norman Lance Downing, MD, Ian Nelligan, MD, Maja Artandi, MD, Christopher Sharp, MD

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During the 2020 Covid-19 pandemic, Stanford Healthcare rapidly shifted to more than 75% video visits for primary care and conducted 20,000 Virtual Health visits within two months. The Virtual Health program encompasses the continuum of care, from before the virtual clinical encounter to post-visit care support. After rapid program evaluation at four weeks and ten weeks, we found issues with system, provider and patient readiness, which impacted Virtual Health patient engagement and quality of care. Here, we share our lessons learned, including our Virtual Health Clinical Process model and Patient Engagement model, which are informing our actions as we build out our Virtual Health programs.

As health systems refine virtual health programs, hastily developed by necessity, we hope these models will provide useful tools to sustain and enhance virtual care delivery.
Rapid Cycle Program Evaluation and Innovation

Stanford Primary Care and Population Health clinics comprise thirteen clinical groups including general primary care, senior care, urgent care, employer-based clinics, concierge medicine, and coordinated care. During the first two months of Virtual Health roll-out, our Stanford primary care providers conducted over 15,000 video and 3,500 telephone visits. Virtual Health encompassed virtual visits and all of the clinical activities surrounding the clinical care which were no longer conducted in person.

Within four weeks after initiating the Virtual Health program, we conducted more than 80 interviews with staff and providers (physicians, advanced practice providers, medical assistants [MAs]) in Stanford Primary Care to understand their experiences around Virtual Health. Despite high provider and patient satisfaction, technical limitations and system readiness challenges hindered visit quality, and from the provider viewpoint, left some patients unprepared for virtual visits. Providers observed that patients with cognitive impairment, language barriers, or technology access concerns experienced disproportionate challenges. Providers struggled with platform connectivity, the provider-directed patient self-exam, and establishing an emotional connection with patients. Some medical assistants (MAs) felt unfulfilled, with less direct patient contact.

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The next six weeks saw a period of creativity, led by clinic MAs who spontaneously formed improvement teams to address identified challenges. These were later brought together centrally to coordinate clinic improvement efforts. At ten weeks, we surveyed all primary care providers system-wide to identify general issues relating to provider burnout. We re-conceptualized our engagement strategy and identified new areas for growth.

Virtual Health Patient Engagement Model

The Virtual Health program delivered extremely variable quality of care, for several reasons. In Virtual Health, more responsibility is placed on patients to prepare for the visit, to examine themselves and to generate their own health data, while providers are expected to make sound decisions with a very different set of data. Given the circumstances of the transition, many patients became highly activated, whereas others were left behind.

Our prior systems were optimized for in-person care, and were not as suitable for Virtual Health care delivery. Several factors were difficult or in some cases impossible to adapt to Virtual Health. In-person visits relied on our medical staff to obtain in-person patient updates, vital signs, and
perform detailed follow-up. Patients had time to prepare for their visits while in the waiting area, center, and develop their visit agenda. Provider exams, routine imaging and procedures occurred immediately on-site. Rapid, direct communication around patient encounters by providers and medical assistants enhanced care follow-up and continuity, while informal face-to-face communication with colleagues and specialists supported clinical decision-making.

We developed a Virtual Health Patient Engagement model that incorporated principles of the NAM Quintuple Aim, which evolved from the NAM Triple Aim (quality of care, cost, patient experience) to include patient equity and inclusion, and prevention of provider burnout. Drawing from the WellMD model, we considered factors to support patient engagement in Virtual Health, including system/technology support, support by clinical teams, and customized support for self-care (Figure 1).

**FIGURE 1**

**Stanford Virtual Health Patient Engagement Model**

Patient engagement is a key driver of high quality health care outcomes. The Stanford Virtual Health Patient Engagement Model considers the interactions between the health system & technology teams, clinical teams, and customized patient self-care necessary to support patient engagement.

Source: The Authors
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System and Technology Support

A foundational step to building the infrastructure for Virtual Health was to convert key elements of the in-person visit to the virtual experience. This included developing processes for Virtual Rooming, Virtual Waiting Room, Virtual Visit, Virtual Check-Out, and Continuous Virtual Care & Support (Figure 2).

FIGURE 2

Stanford Virtual Health Clinical Process Model

The Stanford Virtual Health Clinical Process Model considers key activities to promote high quality Virtual Health care, including activities by patients and separately, by providers, staff, and the health system.

Source: The Authors
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Virtual Rooming

Providers and MAs quickly recognized that many patients were unprepared for their video visit. At several primary care sites, care teams met to develop and pilot independent solutions for pre-visit preparation. MAs experimented with virtual rooming strategies, depending on their resources,
ranging from low touch (secure patient portal message with written rooming questions/screenings) to medium touch (5-10 minutes phone calls with chief complaint and health maintenance review) to high touch (15-minute phone or video visits for comprehensive agenda setting, health maintenance review, behavioral health screening, and medication review). After three weeks of experimentation, MAs and clinic leadership had division-wide meetings to share and adopt best practices and develop new workflows around health maintenance (HEDIS and MIPS measures). Two weeks later, about 75% of patients had a Virtual Rooming visit with a MA. Providers reported that patients undergoing Virtual Rooming were generally more prepared for and more engaged in their video visit.

**Virtual Waiting Room**

 Patients were asked to log on to the patient video portal 5-10 minutes in advance of their provider visit, to ensure that they didn’t have video visit access problems, to verify medications, and to help the clinic keep running on schedule. When patients logged on, they could complete questionnaires, prepare for their visit, or watch videos related to their health (CHF only, at this writing, with expansion plans). Based on provider/patient feedback, we have begun plans for an interactive virtual clinic platform to maximize the utility of this waiting time.

**Virtual Checkout**

 Teams were concerned that critical issues in scheduling/follow-up would fall through the cracks with Virtual Health implementation. Employer-based clinics and Coordinated Care recognized that many patients did not want to discuss health maintenance when they had acute issues. To address this gap, MAs called patients after video visits to help with scheduling procedures and labs, and also conducted appropriate health maintenance screening for depression, tobacco cessation, and more. Positives screens in the after-visit setting triggered actions such as behavioral health follow-up.

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**Clinical Team Support**

 During program evaluation, providers reported wide variation with establishing patient rapport and conducting the virtual physical examination. Two education teams began working on engagement and physical examination best practices.

**Tele-Presence**

 To help providers achieve meaningful connection with Virtual Health patients, the Stanford Presence group developed and distributed five best practices for telepresence communication:

- Prepare with intention (pause, refresh, focus, prepare)
• Listen intently and completely (remain visible on screen, lean in, maintain eye contact, communicate through facial expressions, avoid interruptions)

• Agree on what matters most (establish a virtual visit agenda, incorporate patient priorities/goals)

• Connect with the patient’s story (engage virtually with the patient’s home environment and social support)

• Explore emotional cues (look for/validate emotional cues in facial expressions, body language, changes in verbal tone/volume).

Virtual Exam 10

The provider-directed patient self-exam recast the patient’s role from examinee to both examiner and examinee. “Exam coach” was added to the provider’s role. Based on provider feedback, we developed “practical tips” videos for the 10 most useful outpatient problem-focused examination sets, including:

• common concerns: upper respiratory tract infection, shoulder pain, back pain, knee pain,

• critical conditions: screening stroke exam, congestive heart failure/cardiovascular exam, pulmonary exam

• sensitive examinations: male and female genitourinary exams.

An initial video to teach providers how to coach self-exams on upper respiratory tract, low back pain and shoulder pain was viewed 1,800 times on YouTube within a few weeks. Research has begun on validating these measures, and developing additional exam videos for both providers and patients.

Self-Care Support

To address the need for targeted support for patient self-care, including education and integrated home monitoring, we developed and have begun to build out the following resources.

Virtual Support

Over two months, we strengthened the Virtual Support programs that provided longitudinal health monitoring and support for goals of care.

Digital Lending Library

We launched a Digital Lending Library to send Internet of Things (IoT) devices to appropriate patients, allowing for home-monitoring of parameters such as blood pressure, weight, and pulse, with these data streamed to our electronic health record system (EHR). We have several hundred devices available, funded by grants.

Technology/AI-enabled care
Teams prioritized patient-focused app development for streamlined health and communication. For instance, we expanded advance directive planning by developing a mobile-native app called CARE-IT (Stanford Care Itinerary) based on an advance directive initiative called the Stanford Letter Project, to help patients learn about, record, and share their wishes about their care.

Stanford Technology Assistance Resource Team (START)

Many older, and some non-English speaking patients struggled with video visit technology. We piloted a technology resource assistance team with MAs to help these patients access Virtual Health programs. Additionally, digital health teams created instructional videos to onboard patients and troubleshoot technical issues.

**Virtual Continuity**

Within a month of launching Virtual Health, several care teams converted their in-person programs to virtual programs, adding new offerings to support self-care.

Chronic disease management and group education

Teams converted existing diabetes, weight management, intensive behavioral health, and depression programs to virtual programs, adding both group classes and one-on-one support. Psychologists at one site offered new Virtual Support groups for stress management. To address Covid-19 health concerns, we provided advanced care planning large (>300 person) and small (20 person) group classes.

**Discussion**

In the two months since near universal Virtual Health program implementation at Stanford, we developed new models and processes to drive patient engagement in the virtual setting. Central to our implementation was a combination of individual program innovation, robust rapid program evaluation, centralized program development, and a willingness to foster creativity at every level. This transformation took thousands of hours to develop and hundreds of people to deploy, and, we hope, has positively impacted our larger community.

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We are still building out our Virtual Health programs. The future of post-pandemic Virtual Health is unclear. While we believe that elements of Virtual Health are here to stay, Virtual Health has not yet been proven to achieve the Quintuple Aim, including improving equity in care, promoting joy in practice, and bending the cost curve. During this rapid program growth, we learned valuable lessons which will inform our future work in Virtual Health.
• **Equity and justice as core Virtual Health principles:** While Virtual Health may increase health care access for many patients, it may exacerbate equity-related issues for those with limited access to advanced technologies or limited technology literacy. We should carefully evaluate the technology gap in our patient populations and augment with alternatives where needed. For example, some patients may not have smartphones, but may still be able to interact with care teams via SMS.

• **Rapid evaluation, rapid change:** Rapid qualitative assessment was critical to making mid-course corrections, to gain a deeper understanding of participant experiences. To do so, we used high-efficiency qualitative evaluation rather than traditional longer form qualitative evaluation.

• **Change-makers as interviewers:** Unlike traditional third-party qualitative interviews, many interviewers were qualitative research trained faculty who were involved in program development and implementation. For instance, Population Health leads heard firsthand about MAs’ concerns regarding their lack of patient contact. In response, they expanded the Virtual Rooming project to increase high quality interactions between patients and MAs.

• **Empowering creativity:** Improving patient engagement was not a “top down” process: all individuals within the health system were encouraged to innovate, in a coordinated manner. For instance, each clinic experimented with ways to address patient needs for visit preparation, layering on additional components as new needs emerged.

• **Highest level of the license:** The foundation of many health systems, including ours, is medical assistants. These well-trained, compassionate personnel are often overlooked as sources of innovation. Yet, their deep connection to patients, and understanding as a bridge between patients and providers gives them a unique vantage point as innovators. For instance, the technology access program START began as one bilingual MA reached out to help her Spanish language patients navigate the Virtual Health app and ensure their comfort with the technology.

• **Patient as Partner:** Patient engagement is critical to the success of health care endeavors to improve quality of care. With the initial press of Virtual Health implementation behind us, we can now partner more deeply with patients and our existing patient advisory groups to develop and test future engagement strategies.

While devastating, the Covid-19 pandemic has created an opportunity to re-think the very core of care delivery. The future of health care will likely involve a balance of in-person and virtual care, with the integration and strategic use of different technologies playing a vital role.

As the health care community collectively innovates, we are asking fundamental questions regarding the way in which we practice medicine. We are considering what patients really need from our health care system, the role of the clinical encounter, and the unique advantages/issues of providing care in the digital sphere. While these questions may not be fully answerable now, if Virtual Health is to be a significant part of post-pandemic health care, we need to begin to address these issues from the patient’s perspective.
Malathi Srinivasan, MD
Clinical Professor of Medicine, Stanford University School of Medicine

Anuradha Jayant Phadke, MD
Medical Director, Population Health, Clinical Assistant Professor of Medicine, Stanford University School of Medicine

Donna Zulman, MD
Director, Stanford TelePresence, Clinical Assistant Professor of Medicine, Center for Innovation to Implementation, Stanford VA Palo Alto Health Care System

Sonoo Thadaney Israni, MBA
Executive Director, Stanford Presence, Stanford University School of Medicine

Evan Samuel Madill, MD
Co-Lead, Virtual Waiting Room, Department of Medicine, Stanford University School of Medicine

Thomas Robert Savage, MD
Co-Lead, Virtual Waiting Room, Department of Medicine, Stanford University School of Medicine

Norman Lance Downing, MD
Director, Medical Informatics, Clinical Assistant Professor of Medicine, Stanford Healthcare, Stanford University School of Medicine

Ian Nelligan, MD
Director, Digital Health, Clinical Assistant Professor of Medicine, Stanford Healthcare, Stanford University School of Medicine

Maja Artandi, MD
Clinical Associate Professor of Medicine, Medical Director, Stanford Express Care, Stanford University School of Medicine

Christopher Sharp, MD
Chief Medical Information Officer, Clinical Professor of Medicine, Stanford Healthcare

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