AMA
AMERICAN MEDICAL ASSOCIATION

Return on Health: **Moving Beyond Dollars and Cents in Realizing the Value of Virtual Care**

Research collaboration led by

manatt

AMERICAN MEDICAL ASSOCIATION® RETURN ON HEALTH: MOVING BEYOND DOLLARS AND CENTS IN REALIZING THE VALUE OF VIRTUAL CARE

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Acknowledgments

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I. The Need for a New Value Framework

The COVID-19 pandemic has spurred a dramatic increase in virtual care adoption.[1] The rise has been driven by the necessity for social distancing and enabled by a wide range of policy flexibilities implemented by federal and state legislators, regulators and payers.[2] However, many of these allowances are currently temporary. As the pandemic ebbs, policymakers and payers are deciding whether and how much to pay for virtual care services in the future, leaving clinicians uncertain as to whether they will be able to afford to continue their virtual care programs. Clinicians, payer executives and policymakers are often making these decisions based on outdated telehealth measurement strategies that are overly generalized and do not account for the realities of how health care will be delivered and paid for in the future.[3,4,5,6]

Accelerated by the pandemic, we are entering an era of digitally enabled care, characterized by fully integrated in-person and virtually enabled care delivery models that "hybridize" care delivery based on clinical appropriateness and other factors such as convenience and cost. Digitally enabled care models will be developed across a broader range of clinical conditions and acuity levels. The integration of new virtual care solutions such as video visits, remote monitoring, asynchronous telehealth, continuous and passive sensors, and augmented intelligence (AI) into digitally enabled care models offers the potential to address the quadruple aim of enhancing patient experience, improving population health, improving health care professionals' work life and reducing costs.[7]

Though the existing body of evidence regarding the value of virtual care has grown substantially in recent years, it is narrowly focused on short-term measures of financial value. There remains scant literature regarding the long-term effects of virtual care, such as improvements in access

DEFINITIONS

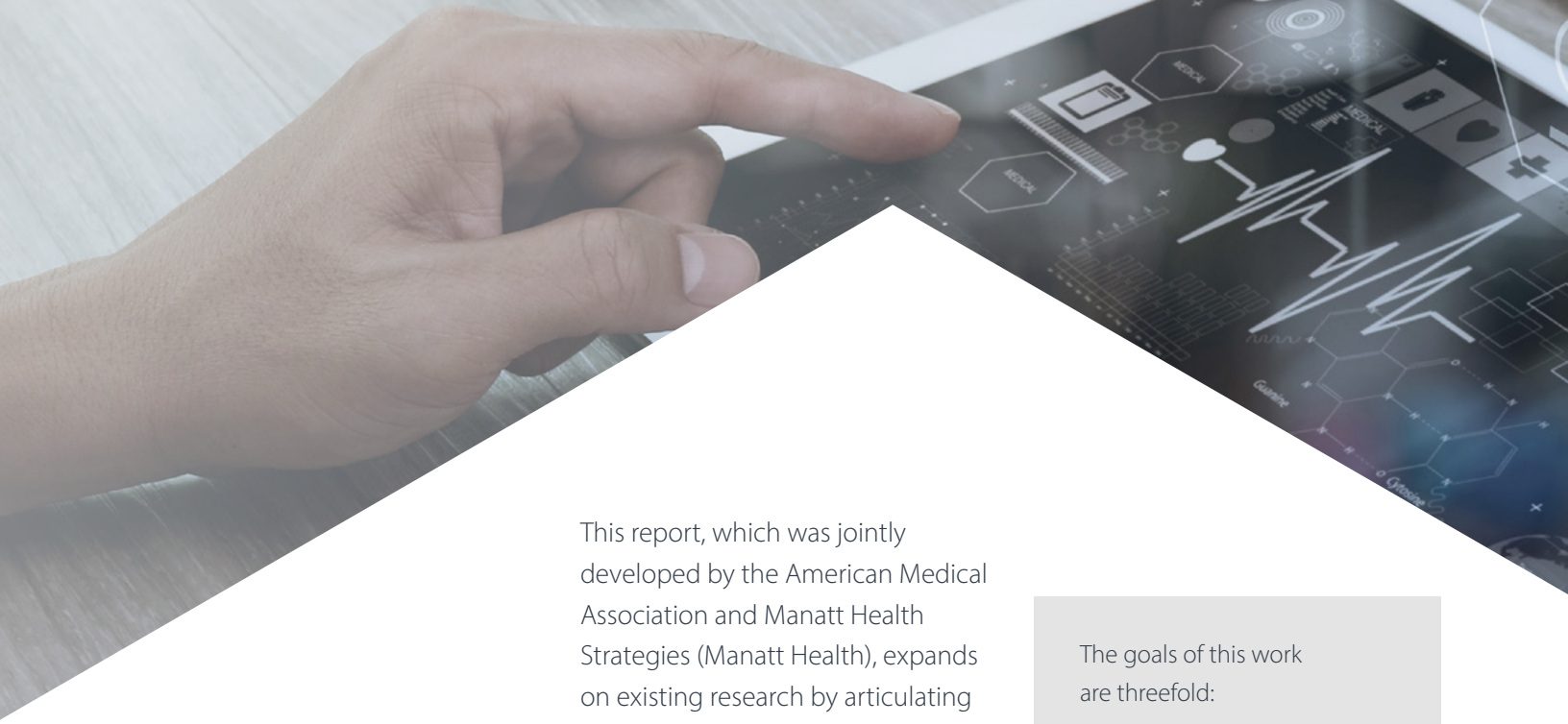
"Virtual Care"
Health care delivered remotely—synonymous with "telehealth."

"Digitally Enabled Care"
Fully integrated in-person and virtual care models that hybridize care delivery based on clinical appropriateness and other factors such as convenience and cost.

"Value Stream"
Categories that specify how digitally enabled care models can generate value.

"Environmental Variables"
Contextual factors that impact the value that can be generated by digitally enabled care models.

Note: See here for the American Medical Association's definitions of telehealth.



to care, clinical outcomes, the impact on the patient and clinician experience, the potential for operational efficiencies, or the impact on health equity. More research is needed to define inequities in uptake and provision of digitally enabled care models to ensure that digitally enabled care is universally accessible and available. Additionally, existing evidence and evaluative methods primarily answer questions of feasibility or seek to determine whether virtual visits are equivalent to in-person visits, rather than assessing the overall value of digitally enabled care models. A broader, more comprehensive framework is needed in order to measure the value of digitally enabled care.

This report, which was jointly developed by the American Medical Association and Manatt Health Strategies (Manatt Health), expands on existing research by articulating a more robust framework for measuring the value of digitally enabled care that accounts for the various ways in which virtual care programs may increase the overall "return on health" by generating positive impact for patients, clinicians, payers and society going forward. The framework proposed in this report builds on previous strategies to account for a wider range of virtual care program types, value streams and environmental variables, such as specific clinician types and clinical use cases, payment arrangement(s), and program target populations. In addition, the report identifies opportunities for health care stakeholders to support digitally enabled care as they develop their coverage and payment policies and strategies in the years ahead.

The goals of this work are threefold:

1. To propose a comprehensive framework that defines the various ways in which virtual care programs are generating, and can generate, value, with a focus on value creation for all types of health care organizations, clinicians, and care team members and patients;
2. To demonstrate how that framework is being used today through real-world case studies from Virginia Commonwealth University Health, Ochsner Health, Massachusetts General Hospital, and Cityblock Health and can be used to more precisely and holistically measure the value of virtual care; and
3. To highlight opportunities for health care stakeholders to realize the full potential of digitally enabled care in the years ahead.

II. Evolution Toward Digitally Enabled Care

The health care system is in the midst of a decades-long shift from in-person care delivery to digitally enabled care models that blend the best features of in-person care delivery with those of virtual care. Before the broad adoption of the internet in the 1990s, almost all care was delivered in person, either in clinical settings or in the home. From the 1990s through early 2020, virtual care[i] became increasingly recognized as a new method of care delivery, but adoption was low, representing less than 1% of overall health care volume.[8] Pre-pandemic, virtual care primarily existed outside of the traditional health care delivery system except in the case of long-standing telehealth models that have been in practice for several decades (e.g., telestroke and teleradiology). Some innovative organizations had implemented integrated virtual care tools more holistically, but for the most part, due to coverage, payment and other limitations, the virtual care ecosystem often existed parallel to and disconnected from the in-person health care ecosystem.[9,10]

The COVID-19 pandemic spurred a dramatic increase in virtual care adoption and use.[11,12,13] National surveys among physicians and patients have indicated that both groups desire to continue to leverage virtual care beyond the pandemic and show high rates of satisfaction among telemedicine users.[14,15] As a result of these trends, we are moving into an era of

SUMMARY OF THE EVIDENCE

As clinicians have evolved from traditional in-person care delivery toward digitally enabled care, so too has the literature seeking to measure various components of value for different virtual care models in different populations.

Further analysis on existing literature can be found in Appendix 2, "State of the Evidence on Virtual Care."

[i] Virtual care models include both synchronous and asynchronous virtual care modalities that occur between multiple clinicians or between a clinician and a patient. Examples include virtual video visits for urgent care, teletherapy visits and virtual consults for stroke care, among myriad other clinical uses.

IMPACT ON EQUITY

We know that advances in virtual care are not reaching, improving health or generating value for all communities equally. Communities historically marginalized by the health care system, including Black, Indigenous, People of Color, Immigrant, LGBTQ+ and People with Disabilities, have experienced the perpetuation and exacerbation of inequities in access to and quality of care in this increasingly virtual setting. Barriers to achieving value from virtual care also impact providers working with marginalized communities, including but not limited to those working with low-income segments of marginalized communities in safety net settings. It is critical to take an upstream approach to understanding the drivers of these inequities in virtual care access and quality, including technology device access, connectivity and poor usability. We must name root causes: exclusionary design that fails to center virtual care solution development on historically marginalized communities upfront, as well as the impact of systemic racism and oppression of other marginalized groups on resource allocation that has resulted in inequitable infrastructure development and economic and social system exclusion.

SOURCES:

Weber, Ellerie, et al. "Characteristics of telehealth users in NYC for COVID-related care during the coronavirus pandemic." Journal of the American Medical Informatics Association 27.12 (2020): 1949–1954.

Walker, Daniel M., et al. "Exploring the digital divide: age and race disparities in use of an inpatient portal." Telemedicine and e-Health 26.5 (2020): 603–613.

Singh, Karandeep, et al. "Many mobile health apps target high-need, high-cost populations, but gaps remain." Health Affairs 35.12 (2016): 2310–2318.

Nouri, Sarah, et al. "Addressing equity in telemedicine for chronic disease management during the Covid-19 pandemic." NEJM Catalyst Innovations in Care Delivery 1.3 (2020).

digitally enabled care, characterized by fully integrated in-person and virtually enabled care delivery models that will seek to hybridize care delivery based primarily on clinical appropriateness and other factors such as care integration, convenience and cost. Digitally enabled care models are beginning to be developed across the full range of disease acuity and across many clinical conditions, from low-acuity urgent care visits, to hospital-level care at home, to ongoing chronic care management.

This evolution to digitally enabled care will fundamentally transform the value equation for health care professionals and payers. Instead of focusing narrowly on whether a specific type of visit can be delivered virtually (the focus of most virtual care value discussions today), the attention will shift to how we can use innovative technologies to enhance overall episodes of care, blending a virtual and in-person experience in ways that improve access and experience for some patients while maintaining or improving quality and reducing long-term costs. Figure 1 details how the shift to digitally enabled care will impact how care is delivered, clinical data are collected and analyzed, care teams are deployed, and overall value is generated. As discussed within subsequent sections of this report, further analysis is needed to explore opportunities for value creation centered on historically marginalized patient populations.

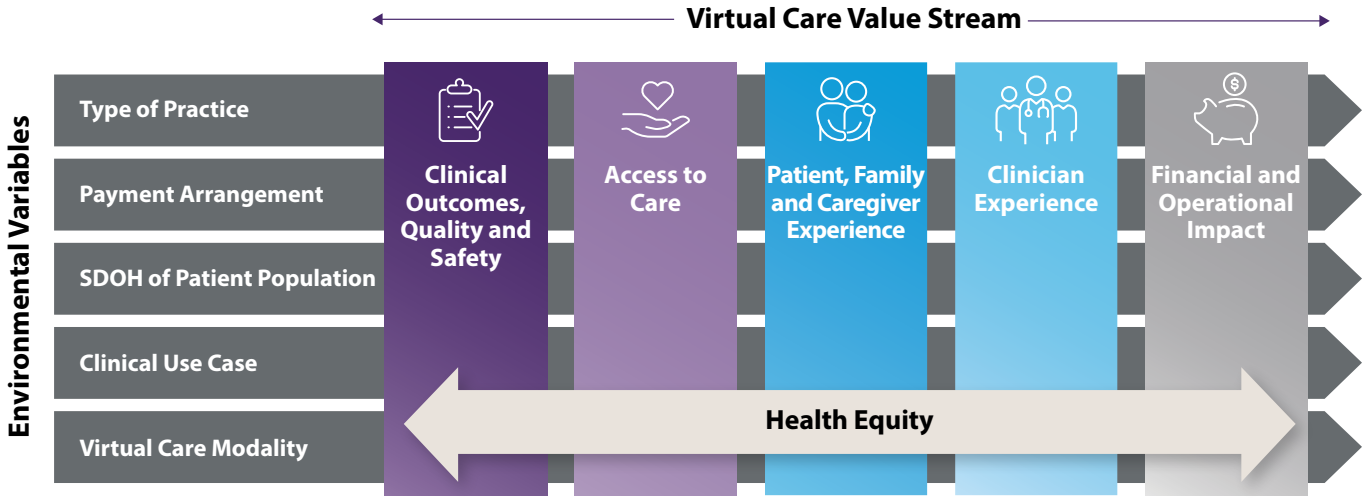
FIGURE 1. EVOLUTION TOWARD DIGITALLY ENABLED CARE

	IN-PERSON ONLY CARE	PARALLEL IN-PERSON AND VIRTUAL CARE	DIGITALLY ENABLED CARE
Primary Site of Care	In-person	In-person or virtual, usually based on convenience, with limited coordination in between	Integrated in-person and virtual, based on clinical need and appropriateness, with a high degree of coordination in between
Care Coordination Across Clinicians	Low – often fragmented and intermittent across different clinicians	Moderate – in-person and virtual care typically not integrated, so care is discontinuous across settings and clinicians	High – highly coordinated care experience across clinicians and settings enabled by interoperable telehealth and electronic health record platforms
Care Coordination Across Time	Limited, as everything needs to happen in person	Moderate – some types of visits can occur virtually, and care can be coordinated remotely	High – virtually integrated care teams can connect with each other and with the patient seamlessly and in real time as needed
Collection and Use of Clinical Data	Data collected and used in clinic, as frequently as visits occur	Data primarily collected in clinic, with some collected virtually; data are used primarily in person during visits to intermittently adjust care plan	Data primarily collected virtually using at-home devices and automatically shared with care team (ensuring privacy and security guardrails are in place), with some data collected in clinic as needed; data are used primarily virtually to inform diagnoses and continuously tweak care plan
Potential Impact of Care Model on Overall Value	None – in-person care is the baseline	Limited – parallel nature limits significant impact on value	High – digitally enabled care offers the potential to be more accessible, higher quality and lower cost
Patient Journey Example: Patient With Hypertension	Patient is seen in person every 3–6 months and otherwise in person as needed (e.g., blood pressure is uncontrolled, medication management)	Patient is seen in person every 3–6 months and otherwise in person or virtually as is clinically appropriate (e.g., blood pressure is uncontrolled, medication management)	Patient is seen in person less frequently, is monitored regularly for blood pressure, and has appropriately timed virtual coaching sessions to achieve or maintain blood pressure control through active medication management and lifestyle change

III. A Framework for Measuring the Value of Digitally Enabled Care

As the shift toward digitally enabled care continues, it will be critical to have a framework to guide clinicians, virtual care leaders, payers and other health care stakeholders in assessing value created for patients and for themselves. The ability to define and measure specific value streams will be necessary for designing new care models, making program prioritization decisions, and determining appropriate coverage and payment policies in the future. Based on a review of the existing literature on the value of virtual care and interviews with more than 20 national experts, we are proposing a new framework for measuring the value of virtual care.

FIGURE 2. FRAMEWORK FOR MEASURING THE VALUE OF DIGITALLY ENABLED CARE

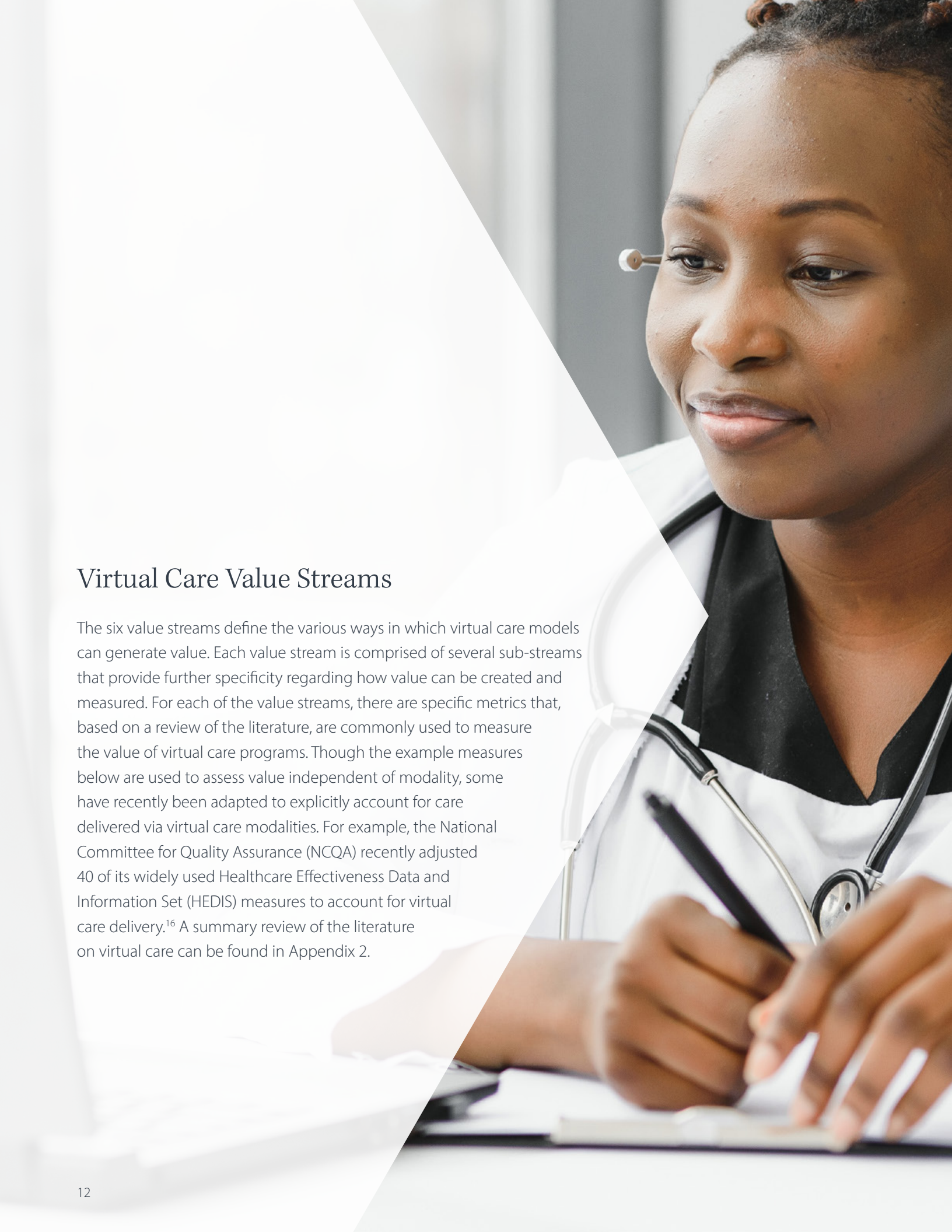


ENVIRONMENTAL VARIABLES

The framework presented in Figure 2 describes five environmental variables that affect the value generated by any virtual care program. The environmental variables define the various contextual conditions that impact each value stream. The degree to which any of the streams generate value is dependent on these variables, which are further defined below.

TABLE 1. ENVIRONMENTAL VARIABLES

ENVIRONMENTAL VARIABLE	IMPACT	EXAMPLES
Type of Practice	Impacts resource availability, potential scalability, breadth of clinical programs and clinical use case priorities	• Independent practice • Large group practice • Health system • Clinic or health center
Payment Arrangements and Rates	Impacts financial sustainability of virtual care and business priorities	• Fee-for-service (no link to quality and value) • Pay-for-performance • Alternative payment models (e.g., shared savings or shared risk) • Population-based payment (e.g., capitation)
Social Determinants of Health of Patient Population	Patient population demographics are associated with social determinants of health inequities impacting access to and benefits from virtual care, requiring intentional design including device and platform selection, connectivity requirements, functionality, content and user interface	• Race • Ethnicity • ZIP code • Immigration status • Sexual orientation • Gender identity • Disabilities • Age • Income • Housing access • Access to broadband and technology • Language
Clinical Use Case	Impacts care model design, data collection requirements, technology requirements and business imperatives	• Primary care • Specialty care • Chronic care • Acute care *Note: All the above encompassing behavioral health*
Virtual Care Modality	Impacts technology requirements and costs, payment potential, and operational requirements	• Video visit • Remote patient monitoring • Interprofessional consult • Virtual secure messaging



Virtual Care Value Streams

The six value streams define the various ways in which virtual care models can generate value. Each value stream is comprised of several sub-streams that provide further specificity regarding how value can be created and measured. For each of the value streams, there are specific metrics that, based on a review of the literature, are commonly used to measure the value of virtual care programs. Though the example measures below are used to assess value independent of modality, some have recently been adapted to explicitly account for care delivered via virtual care modalities. For example, the National Committee for Quality Assurance (NCQA) recently adjusted 40 of its widely used Healthcare Effectiveness Data and Information Set (HEDIS) measures to account for virtual care delivery.[16] A summary review of the literature on virtual care can be found in Appendix 2.

VALUE STREAM #1: CLINICAL OUTCOMES, QUALITY AND SAFETY

Improvement of clinical outcomes, quality and safety is often the most important goal among clinicians who implement virtual care. When implemented effectively, virtual care programs may enhance clinical outcomes, improve quality of care, increase patient safety and improve clinical processes. Clinical and safety measures have historically been designed to measure the clinical effectiveness of in-person care, though they are increasingly used to assess effectiveness across modalities (in-person, parallel care, digitally enabled care). For example, clinical outcome measures related to blood pressure control or HbA1c levels can be used to assess the effectiveness of a wide range of care models, independent of modality. Some in-person measures may need to be updated to reflect an increase in virtual care, as NCQA has done with many of the HEDIS measures.[ii]

CLINICAL OUTCOMES, QUALITY AND SAFETY SUB-STREAMS	EXAMPLES OF COMMONLY USED MEASURES
Clinical quality and safety outcomes	• Mortality measures (e.g., mortality rate) • Functional status measures (e.g., Functional Independence Measure) • Disease morbidity measures (e.g., Patient Health Questionnaire-9) • NCQA HEDIS measures[iii] • Readmission rates (e.g., 30/60/90-day) • Emergency department (ED) visits • Number of visits to correct diagnosis • Adverse event rate (e.g., postoperative infection rate) • Patient-reported outcomes (e.g., Brief Pain Inventory) • Antibiotic prescribing rate
Clinical processes	• Medication adherence • Adherence to care plans or discharge instructions • Adherence to evidence-based guidelines (e.g., door-to-needle time) • Improvement in disease detection

[ii] It should be noted that the quality measures referenced in the case studies in this report were used for internal quality improvement purposes. Highlighting the measures is not an endorsement of the measures, especially when they are implemented into accountability programs. There are potential unintended consequences when an accountability program rushes to implement a measure. For example, there is emerging research that the All-Cause Readmission measures used in the Medicare program may be contributing to increased mortality or that the decrease in readmission is more related to a general decline in admission rates.

[iii] In June 2020, the Board of Directors of NCQA approved a sweeping set of adjustments to 40 of its widely used HEDIS measures.

VALUE STREAM #2: ACCESS TO CARE

Virtual care programs may reduce barriers that delay patients' access to timely care. This value stream seeks to measure the impact that a virtual care program may have on access to care by assessing a program's impact on availability, appropriateness and affordability of care.

ACCESS TO CARE SUB-STREAMS	EXAMPLES OF COMMONLY USED MEASURES
Availability of care	• Time to third next available appointment or consultation • Percentage of patients who completed specialty referral within 14 days of referral or interprofessional consult request • Percentage of patients with coverage for virtual visits on their current health insurance plan • Median travel time to care per patient • Number and frequency of patient touchpoints with clinician and/or care team • Reduction in patient transfers
Equitable care*	• Percentage of patients who delay care due to access barriers (e.g., lack of access to broadband, provided technology) • Out-of-pocket costs as a percentage of household budget • Percentage of patients with disabilities who are able to conduct a virtual visit through adaptive technologies • Percentage of patients who can conduct a virtual visit in their desired language

*See Value Stream #6 for health equity-specific measures.

VALUE STREAM #3: PATIENT, FAMILY AND CAREGIVER EXPERIENCE

Virtual care programs have the potential to enhance the overall care experience for patients as well as their families and caregivers. This value stream seeks to measure the impact that a virtual care program may have on patient, family and caregiver experience with a focus on the clinical and technology experience.

PATIENT, FAMILY AND CAREGIVER EXPERIENCE SUB-STREAMS	EXAMPLES OF COMMONLY USED MEASURES
Clinical and/or technology experience	• Net promoter score (NPS) • Patient activation measure (PAM) • Hospital or Clinician and Group Consumer Assessment of Healthcare Providers and Systems Survey (HCAHPS or CG-CAHPS) • Reported understanding of physician instructions: assess patients' understanding of treatment instructions provided by their physician

VALUE STREAM #4: CLINICIAN EXPERIENCE

The adoption of virtual care can enhance the experience of clinicians and care teams by enabling them to connect and care for patients more easily, allowing for more flexible work schedules and helping clinicians connect more quickly and easily with their colleagues. This value stream seeks to estimate the impact that a virtual care program may have on clinicians' technology and work experience delivering virtual care.

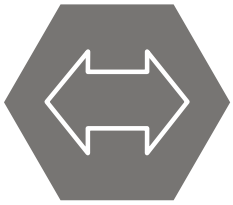
CLINICIAN EXPERIENCE SUB-STREAMS	EXAMPLES OF COMMONLY USED MEASURES
Technology experience	• Reported ease of using technology, obtaining clinical information, participating in the virtual visit
Work experience	• Engagement and satisfaction with work (self-reported) • AMA-recommended physician satisfaction surveys (e.g., Mini-Z)[iv] • Annual percentage of physician turnover (or annual recruiting costs) • Duration of visit (compared with equivalent in-person visit) • Percentage of visits conducted virtually and in person

[iv] The Mini-Z burnout survey can be found here: https://edhub.ama-assn.org/data/journals/steps-forward/937327/10.1001stepsforward.2017.0010supp3.docx.

VALUE STREAM #5: FINANCIAL AND OPERATIONAL IMPACT

Health care organizations, such as hospitals/health systems, clinician groups or independent practices, will be reluctant to adopt virtual care unless it is financially viable, and payers will be reluctant to pay for it unless it is cost-effective. This value stream seeks to estimate the impact that a virtual care program may have on financial and operational variables, including direct revenue, indirect revenue, direct expenses and operational efficiencies.

FINANCIAL AND OPERATIONAL IMPACT SUB-STREAMS	EXAMPLES OF COMMONLY USED MEASURES
Direct revenue	• Payment for professional services (e.g. virtual visits, remote patient monitoring, interprofessional consults) • Payment for technical services • Program revenue for offering telehealth services (e.g., the fees that community hospitals pay to participate in a telestroke network) • Performance-based payments generated by participation in an alternative payment model
Indirect revenue	• New patient acquisition • Patient retention rate • Percentage of referrals completed • Increased capacity (bed or appointment availability)
Direct expenses	• Telehealth program expenses (e.g., setup costs, staffing, IT infrastructure, maintenance costs) • Malpractice expenses • Clinical care expenses • Total cost per episode of care or per member per month (for payers, employers and clinicians in risk-based arrangements)
Operational efficiencies	• Length of stay • No-show rate • Inpatient or ED throughput rate • Clinician panel size



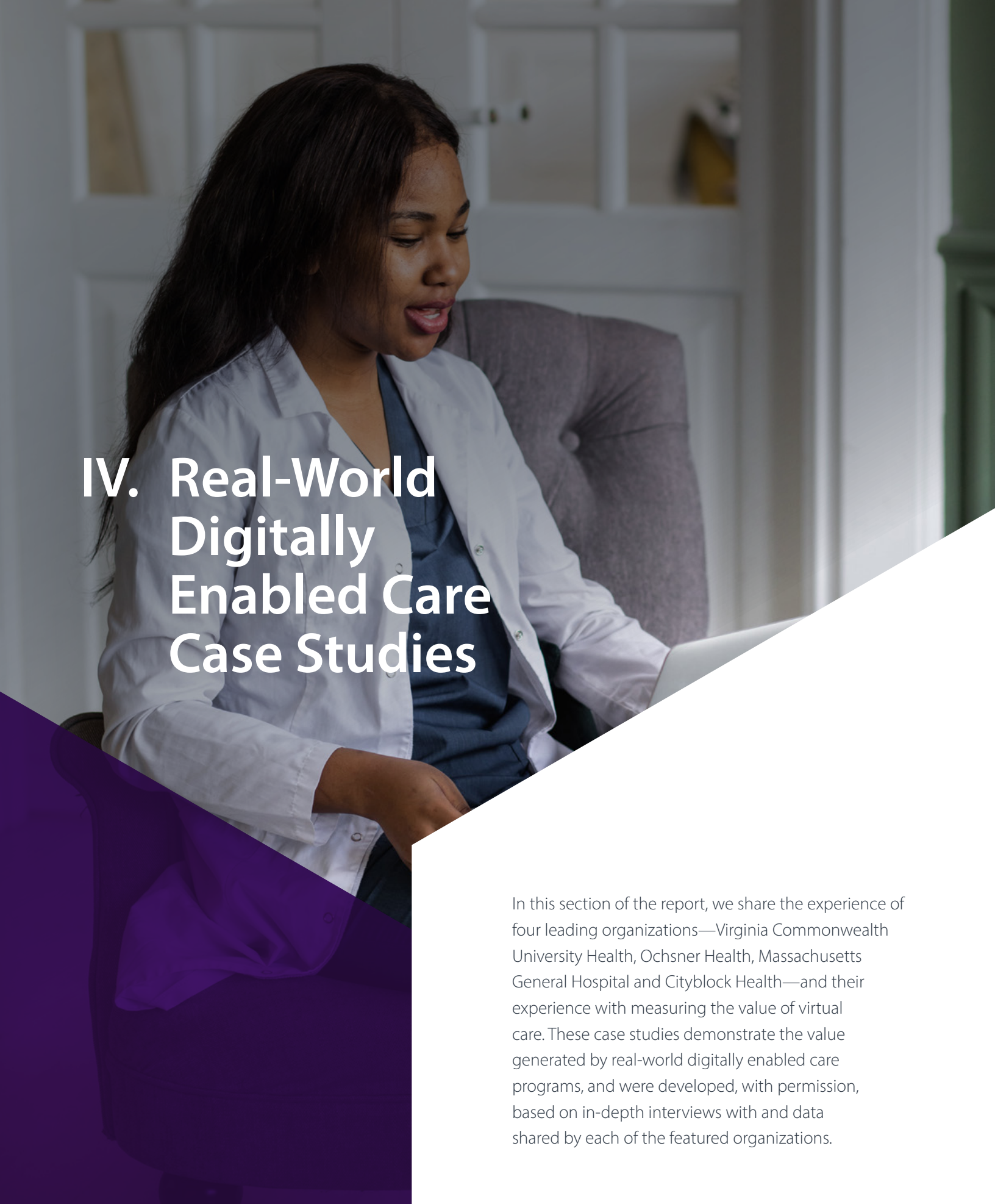
VALUE STREAM #6: HEALTH EQUITY

Health equity is a cross-cutting component of this framework that seeks to understand the impact of a virtual care program across the other value streams for historically marginalized patient populations.

The AMA defines health equity as "having the conditions, resources, opportunities, and power to achieve optimal health." The AMA agrees with the model proposed by Camara Phyllis Jones, MD, MPH, PhD, that achieving health equity requires three strategies: (1) valuing all individuals and populations equally; (2) recognizing and rectifying historical injustices; and (3) providing resources according to need. Unless digitally enabled care models are designed with health equity at the forefront, they can miss opportunities to advance health for and exacerbate inequities impacting historically marginalized populations.

This framework draws on a health equity measurement approach proposed by the Agency for Healthcare Research and Quality,[17] which assesses inequities based on a comparison between subpopulations using a given demographic characteristic that is marginalized by the health care system, such as race, ethnicity, gender identity, sexual orientation, age, language, immigration status, disability status or socioeconomic status. As part of the comparison, difference in performance is observed between a priority population group, or a population group that is provided inequitable care, and a reference group, which is often the best-served or designed-for subgroup. This framework proposes comparing the relative variance in measurement across the value streams and primary drivers when comparing subpopulations, in order to identify opportunities to advance equity in virtual care delivery.

HEALTH EQUITY SUB-STREAMS	EXAMPLES OF COMMONLY USED MEASURES
Equity in clinical outcomes, quality and safety	• Inequities impacting marginalized patient populations in selected process, outcomes, quality and safety measures
Equity in access to care	• Inequities impacting marginalized patient populations in selected access measures
Equity in patient, family and caregiver experience	• Inequities impacting marginalized patient populations in selected patient, family and caregiver experience measures
Equity in clinician experience	• Inequities impacting marginalized clinician populations and/or clinicians caring for marginalized patient populations in selected clinician experience measures
Equity in financial and operational impact	• Inequities impacting provider organizations caring for marginalized patient populations in selected financial and operational impact measures



IV. Real-World Digitally Enabled Care Case Studies

In this section of the report, we share the experience of four leading organizations—Virginia Commonwealth University Health, Ochsner Health, Massachusetts General Hospital and Cityblock Health—and their experience with measuring the value of virtual care. These case studies demonstrate the value generated by real-world digitally enabled care programs, and were developed, with permission, based on in-depth interviews with and data shared by each of the featured organizations.

Virginia Commonwealth University Health – Telepsychiatry During COVID-19

VCU Health

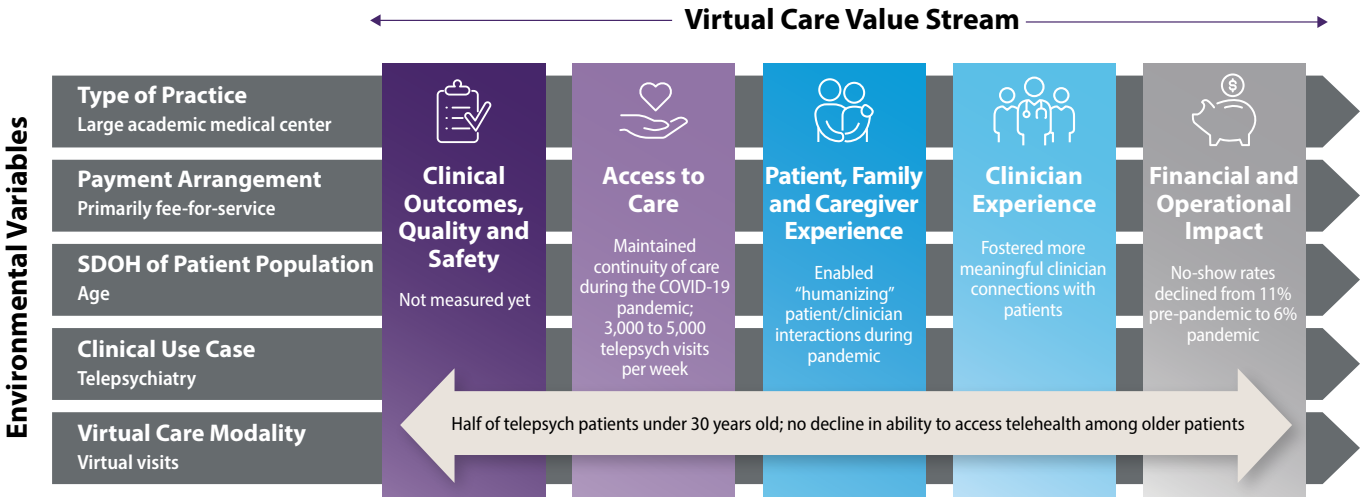
STRATEGIC GOAL

VCU Health implemented telepsychiatry during the COVID-19 pandemic in order to ensure access and continuity of care during a time when in-person interactions were unsafe and to reduce the risk of avoidable disease transmission.

DESCRIPTION

Virginia Commonwealth University Health (VCU Health) has a large service area covering urban, suburban and rural geographies. VCU Health implemented telepsychiatry video visits prior to the onset of the COVID-19 pandemic in an effort to address psychiatry clinician shortages in rural areas; however, utilization was low and telepsychiatry was not a prominent method of care delivery. Once the COVID-19 pandemic began and clinicians were not able to safely interact with patients in person, telepsychiatry, in the form of both video and audio-only visits, became a critical method of connecting with both inpatient and outpatient psychiatry patients.

FIGURE 3. VCU TELEPSYCHIATRY PROGRAM AND IMPACT SUMMARY



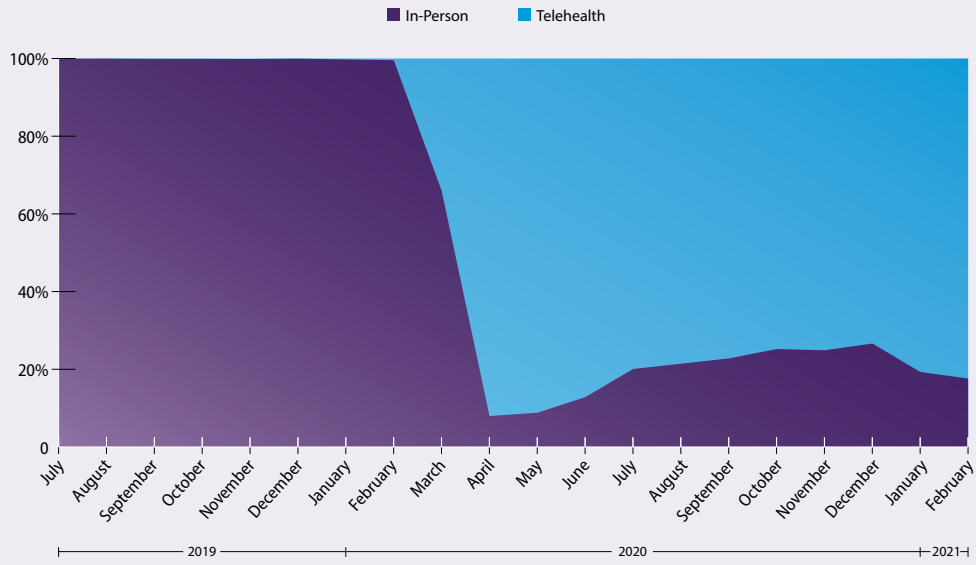
Starting in mid-March 2020, VCU Health psychiatrists and administrative staff began scheduling telepsychiatry appointments interspersed with in-person appointments. Before the appointment, VCU Health administrative staff provide a warm reminder call to the patient to ensure they understand how to log in to their session. During the video visit, the patient connects via the practice's secure, synchronous video visit platform to receive evidence-based teletherapy. To ensure the safety of the patient during the appointment, the clinician verifies the patient's emergency contact information and current location in case an emergency response must be activated during the appointment.

Based on the outcomes described below and the likelihood of continued patient demand for telepsychiatry, VCU Health will continue offering these services after the COVID-19 pandemic has subsided.

PROGRAM IMPACT

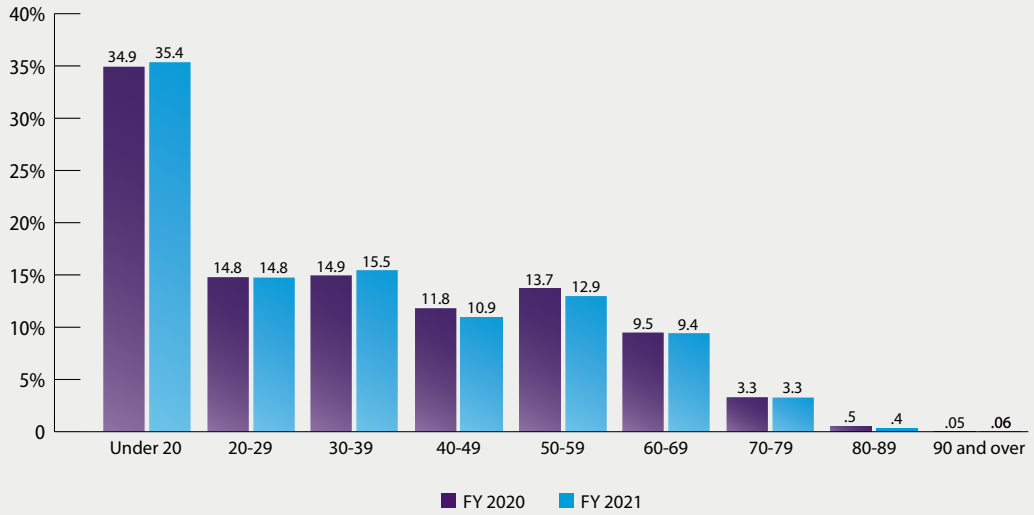
VALUE STREAM	EVIDENCE OF PROGRAM IMPACT
Access to Care	**Continuity of Care:** Prior to the COVID-19 pandemic, nearly all psychiatry visits were delivered in person. During the COVID-19 pandemic, VCU Health clinicians have provided between 3,000 and 5,000 psychiatry visits per week. Telehealth utilization peaked at 92% in April 2020 and has stabilized at about 80% of overall psychiatry visits.
Patient, Family and Caregiver Experience	**Satisfaction With Outpatient Services:** Patients appreciate the option to receive telepsychiatry services in the privacy and comfort of their homes. **Satisfaction With Inpatient Services:** Dr. Robert Findling, chair of the VCU School of Medicine's Department of Psychiatry and telepsychiatry program lead, noted that even when clinicians were technically able to visit with psychiatry patients who were admitted in the hospital, conducting video visits with those patients was more effective and "humanizing" than being in their physical presence while wearing full personal protective equipment.
Clinician Experience	**Satisfaction Delivering Inpatient Care Virtually:** Similar to the patient satisfaction with virtual inpatient care noted above, the ability to connect via video with inpatients, rather than through masks and face shields, is valued by clinicians and has fostered more meaningful clinician connections.

FIGURE 4. PSYCHIATRY VISITS DELIVERED IN-PERSON VS. TELEHEALTH, JULY 2019–FEBRUARY 2021



VALUE STREAM	EVIDENCE OF PROGRAM IMPACT
Financial and Operational Impact	**No-Show Rates:** The no-show rate among psychiatry visits declined from 11% pre-pandemic to 6% post-pandemic as virtual visits went from <1% to more than 80% of total visits. Patients were less likely to miss their telepsychiatry appointment because of the improved convenience of conducting a virtual visit. Additionally, the implementation of a live phone call appointment reminder system was correlated with reduced no-shows.
Health Equity	**Gaps in Access by Age:** As VCU Health's psychiatry program went from an almost exclusively in-person model in FY2020 to one that relied primarily on telepsychiatry to connect with patients in FY2021, there was no reported decline in accessibility of care over time among VCU Health's older patient population. This is notable, as older adults often have more difficulty accessing and using virtual care technology.

FIGURE 5. VCU PSYCHIATRY PATIENT POPULATION BY AGE, FY 2020–2021



Source: VCU Health

Source: Data and content for this case study were provided by and used with permission from VCU Health.

Ochsner Health – Hypertension Digital Medicine Program

STRATEGIC GOALS

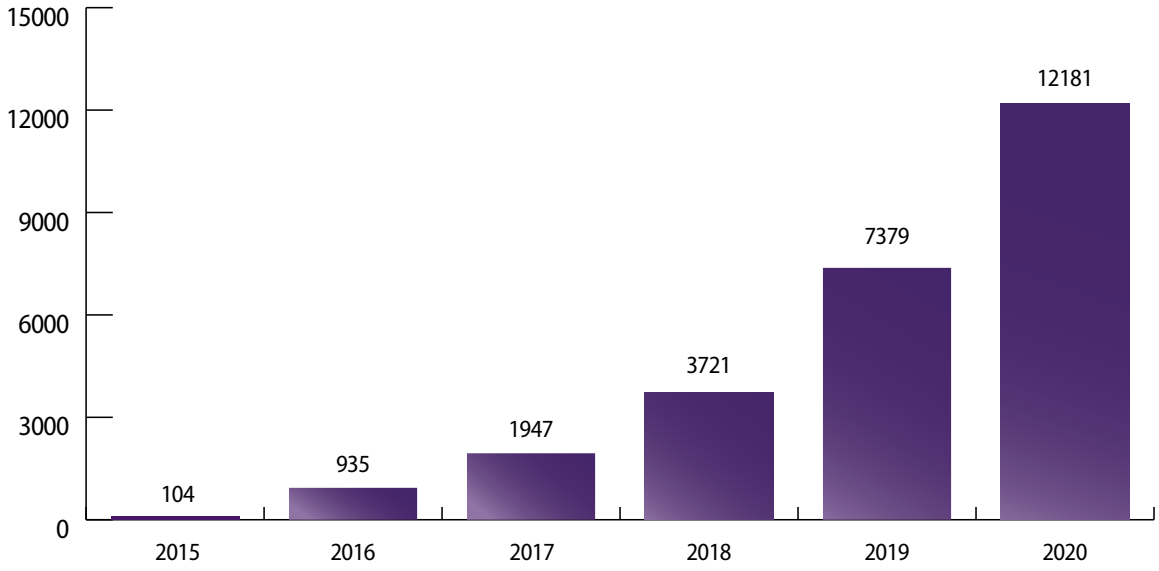
Ochsner utilizes its Hypertension Digital Medicine program in order to:

- Improve clinical outcomes for patients with uncontrolled hypertension.
- Reduce avoidable ED and inpatient utilization by improving hypertension control.
- Improve primary care capacity.

DESCRIPTION

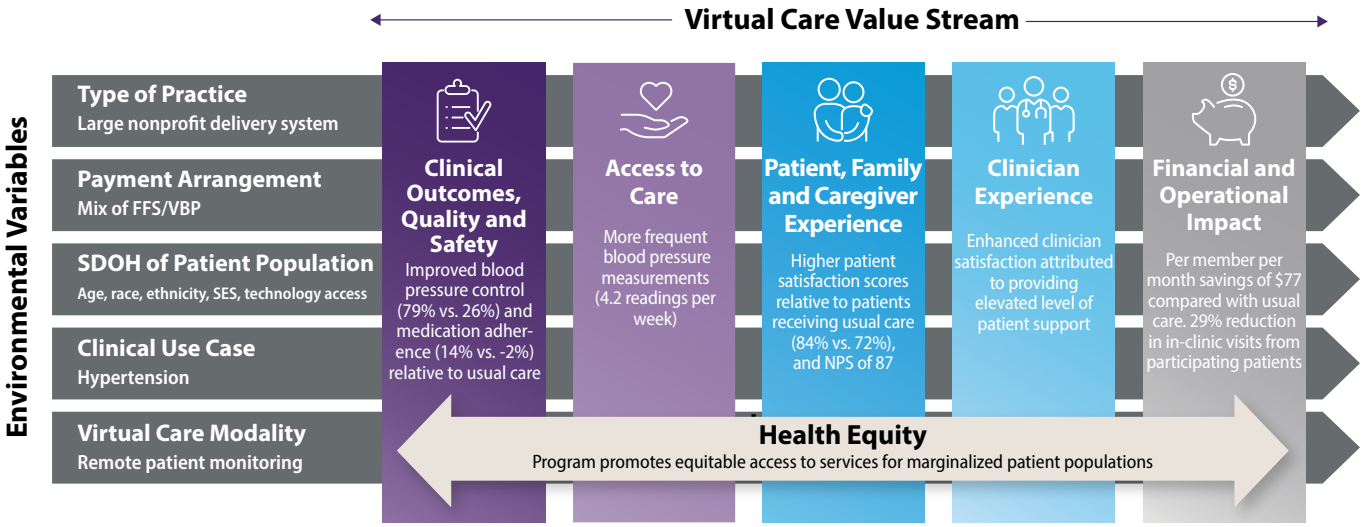
Ochsner Health System is a nonprofit, academic, multi-specialty, integrated delivery system based in New Orleans, LA, that serves over 700,000 patients a year. Ochsner employs over 1,200 physicians and operates over 90 clinics and 20 hospitals. In 2015, Ochsner launched the Hypertension Digital Medicine program, which provides digitally enabled chronic disease management to patients with hypertension, in an effort to address Louisiana's high rates of hypertension.[18] The program provides highly tailored, adaptive care to help program enrollees improve hypertension control rates. The program now serves approximately 13,000 individuals across 10 states. More than half of program enrollees are over 65 years old (65%), are women (55%), and identify their race or ethnicity as white (65%). Approximately, 33% of the program enrollees identify as Black and 2% identify as other. Program enrollment has increased more than 11,000% since program launch (see Figure 7). Ochsner has plans to expand the program to all 50 states in 2021.

FIGURE 6. HYPERTENSION DIGITAL MEDICINE PROGRAM ENROLLMENT



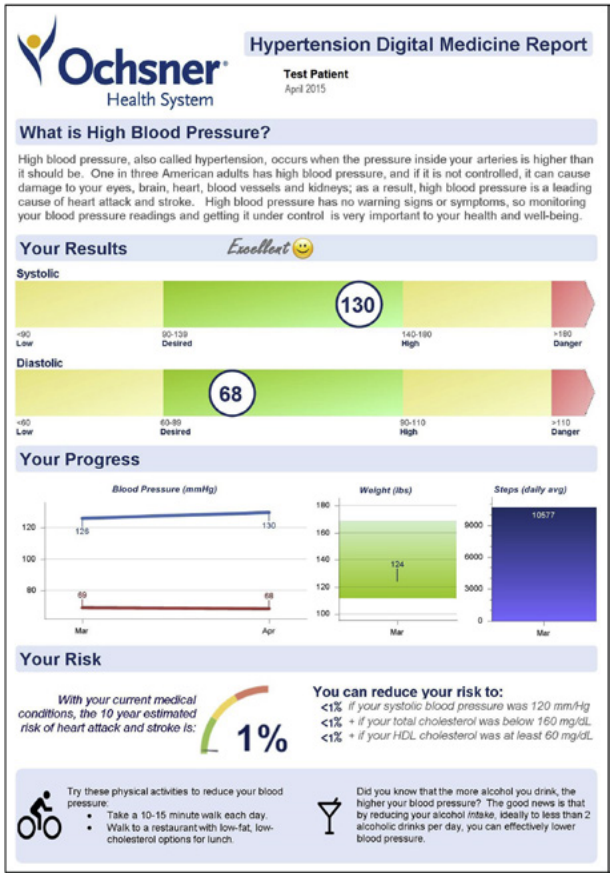
Source: Ochsner Health

FIGURE 7. OCHSNER HYPERTENSION DIGITAL MEDICINE PROGRAM AND IMPACT SUMMARY



Each program enrollee is assigned a dedicated care team (clinician, pharmacist and health coach) responsible for providing education, medication reconciliation and management, and lifestyle recommendations according to established hypertension treatment guidelines. In addition, custom visual tools developed within the electronic health record (EHR) display the enrollee's social needs, trending blood pressure over time, hypertension-related comorbidities, patient activation level, health literacy, and relevant lab results that assist in optimizing the effectiveness and efficiency of the care team.[19] Program enrollees are asked to submit at least one blood pressure reading per week.[v] If the care team has not received a reading from an enrollee for eight days, the enrollee receives an automated text reminder that a blood pressure measurement is needed. Care team members contact enrollees regularly by phone and review blood pressure measurement readings and treatment options for improving blood pressure control. Enrollees are encouraged to work with the care team to co-create the treatment plan by choosing among various lifestyle and medication options.[20] Each enrollee receives a monthly report (see Figure 8) informing them of their progress in the program and tips for achieving better blood pressure control. Information about the enrollee's progress is also available to their primary care provider.

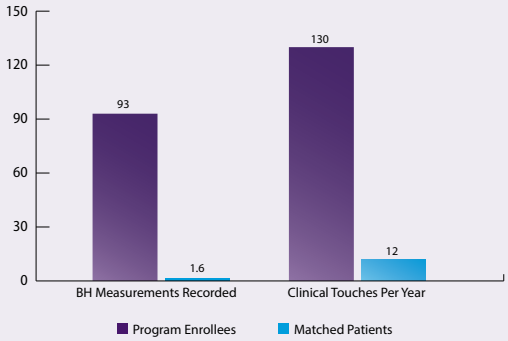
FIGURE 8. MONTHLY PATIENT REPORT



Source: Ochsner Health

[v] Note: See here for the AMA's 7-step self-measured blood pressure (SMBP) quick guide.

PROGRAM IMPACT

VALUE STREAM	EVIDENCE OF PROGRAM IMPACT
Clinical Outcomes, Quality and Safety	**Blood Pressure Control:** Program enrollees achieved greater blood pressure control compared with a propensity-matched group that received usual care (79% versus 26%).[21] **Medication Adherence:** Medication adherence improved 14% among patients in the Digital Medicine program and declined 2% among patients receiving usual care over the evaluation period of six months.[22]
Access to Care	**Clinical Touches:** Program enrollees had more frequent interactions with their care team (see Figure 9), and more blood pressure measurements recorded in the EHR compared with matched patients assigned to usual care.[23] Current enrollees submit, on average, 4.2 blood pressure readings per week. **FIGURE 9. BLOOD PRESSURE MEASUREMENT AND CLINICAL TOUCHES FOR PROGRAM ENROLLEES VS. THOSE IN USUAL CARE (MATCHED PATIENTS)**  Source: Tai-Seale, Ming, et al. "Technology-enabled consumer engagement: promising practices at four health care delivery organizations." Health Affairs 38.3 (2019): 383-390.
Patient, Family and Caregiver Experience	**Patient Satisfaction Ratings:** Program enrollees exhibited higher levels of satisfaction compared with matched patients who received usual care (84% versus 72%).[24] **NPS:** The Digital Medicine program boasts an NPS of 87.[25]

VALUE STREAM	EVIDENCE OF PROGRAM IMPACT
Clinician Experience	**Clinician Satisfaction:** The program has enabled Ochsner's primary care clinicians to provide an elevated level of support to patients, which has enhanced clinician satisfaction. When reflecting on how useful the program had been in a primary care setting, Ochsner's chair of primary care noted to the leader of the Digital Medicine program, "We forgot what help looked like."
Financial and Operational Impact	**Per Member Per Month Cost Impact:** The program saves $77 per member per month compared with usual care.[26] Based on these savings, Ochsner has contracts with several payers and employers who fully cover the costs of the program for their members or employees and, in some cases, even waive copays for program enrollees' hypertension medications. **Primary Care Provider Capacity:** A recent evaluation found that primary care physicians experienced a 29% reduction in the number of in-clinic visits from participating patients. Primary care clinicians reported the program helped reduce their workloads and enabled them to expand access to other patients.[27]
Health Equity	**Equitable Access to Care:** Ochsner has specifically designed the program to promote equitable access to its services for older patients, those with lower incomes, those facing social determinants of health inequities, and those with less prior experience using technologies provided in this program: The program is free to all patients, and some patients have their hypertension medication costs waived. Devices are mailed to patients or provided at the O Bar, a network of Ochsner retail locations which provides hands-on technology support and setup assistance for patients who lack access to or are unfamiliar with using technology. The program's focus on incorporating assessment of social needs in the initial screening and ongoing progress reporting helps improve care team understanding of structural barriers to patient health.

Source: Data and content for this case study were provided by and used with permission from Ochsner Health.

Massachusetts General Hospital – Teleneurology and Telestroke

MASSACHUSETTS GENERAL HOSPITAL

STRATEGIC GOALS

Massachusetts General Hospital (MGH) provides teleneurology and telestroke services through partnership with several community hospitals.

STRATEGIC GOALS FOR MGH (HUB HOSPITAL)

- Distribute MGH's clinical expertise across its network through the standardization of clinical protocols and real-time decision support.
- Preserve inpatient capacity for patients with higher-acuity neurological conditions.
- Support expansion of the MGH network.

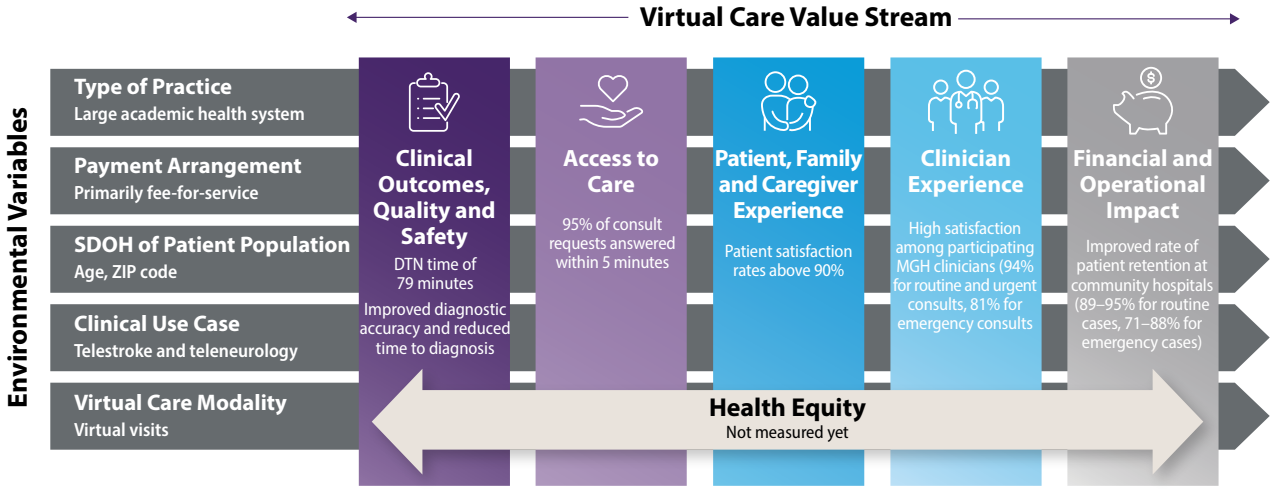
STRATEGIC GOALS FOR COMMUNITY (SPOKE) HOSPITALS

- Retain patients who would otherwise be transferred to MGH or another tertiary hospital.
- Improve availability of timely neurological consultation.

DESCRIPTION

MGH, part of Mass General Brigham, is a large teaching hospital located in Boston, Ma., that offers comprehensive telestroke and teleneurology programs to community hospitals. Telestroke services provide smaller hospitals access to vascular neurologists 24 hours a day, seven days a week, to treat acute stroke and other emergency neurology conditions.[28] Teleneurology services provide smaller hospitals access to neurohospitalists with a variety of different subspecialties, 24 hours a day, seven days a week, to treat urgent and routine neurology conditions. Both services can be flexibly deployed in a wraparound model to cover the hours, days or weeks needed by the smaller hospital if local neurology coverage exists, and both include the option to enable local neurology services to leverage MGH's technology and tools to provide that local coverage virtually as well.

FIGURE 10. MGH TELENEUROLOGY AND TELESTROKE PROGRAM AND IMPACT SUMMARY



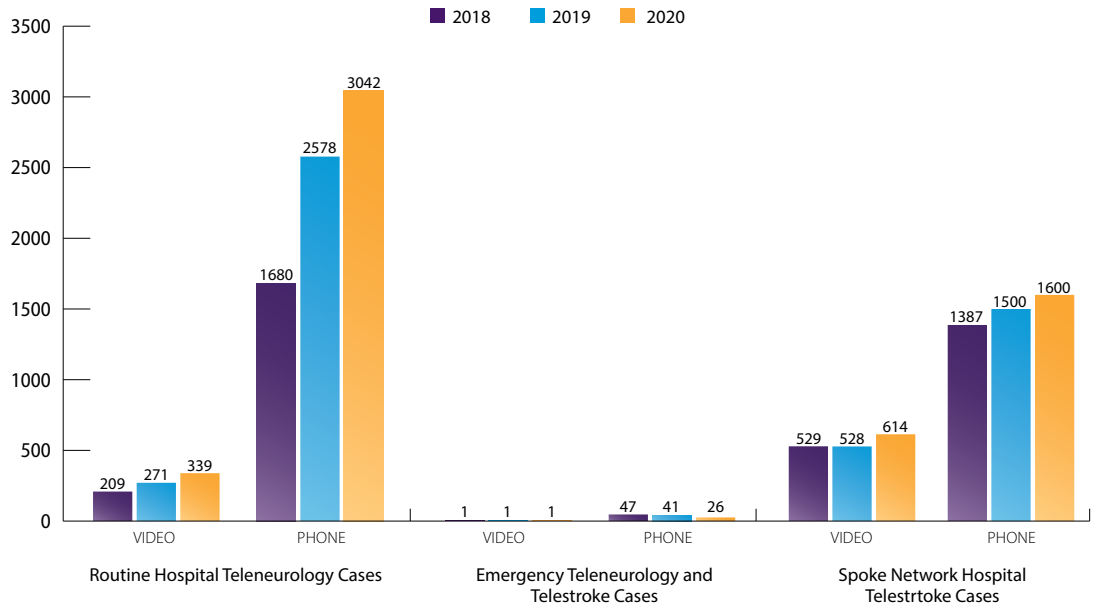
In 2000, MGH pioneered using telestroke capabilities to help emergency physicians at a health system-affiliated institution, Martha's Vineyard Hospital (MVH), to determine whether patients were experiencing an acute ischemic stroke and, if so, whether to administer a lifesaving drug—tissue plasminogen activator (tPA). Initial successes generated by the program at MVH and changes in the state's regulatory environment[vi] that supported expansion of the telestroke model enabled MGH to grow and develop a robust hub-and-spoke specialty telestroke and teleneurology network, which now includes 34 community hospitals. Demographic data specific to the telestroke program indicate that the program serves a predominantly older population; nearly 90% are over age 50, and the median age is 70 years old. Telestroke patients are relatively evenly split by gender.

There are about 15 physicians providing telestroke consults and 12 physicians providing teleneurology consults across all the participating hospitals. These consulting physicians provide several thousand consults per year to community hospitals, many of which no longer have on-site neurologists.

MGH offers participating community hospitals support through:

- 24/7 access to phone or videoconferencing technology to enable remote examination of the patient
- Review of brain scan images and other clinical data to inform decision-making related to stroke or neurological care
- Implementation support for new sites with mock code stroke drills
- Access to prerecorded continuing medical education (CME) and nursing-accredited grand rounds lecture series
- Ongoing technical support and clinical support by an experienced nursing leader who serves as a clinical liaison to the program
- Support from AI applications for the assessment of large strokes or other complex vascular neurology conditions[vii]

FIGURE 11. CONSULT VOLUME BY PROGRAM 2018–2020



Source: Massachusetts General Hospital

[vi] In 2005, the Massachusetts Department of Public Health issued regulations requiring that ambulance personnel bring a patient who exhibited stroke-like symptoms to a certified "Primary Stroke Center" to be evaluated as a candidate for tPA. One requirement for certification was that a licensed physician with acute stroke expertise must be available on a 24/7 basis. Hospitals that lacked 24/7 neurology coverage could use a service such as telestroke to satisfy this rule.

[vii] For more information on the AMA's AI policy, please see here.

PROGRAM IMPACT

VALUE STREAM	EVIDENCE OF PROGRAM IMPACT
Clinical Outcomes, Quality and Safety	**Door-to-Needle Time:** Research analyzing data submitted by 16 of the MGH telestroke network's spoke hospitals on tPA-treated patients from 2006 to 2015 found that hospitals treated a median of 13.5 patients with tPA per year; median hospital-level door-to-needle (DTN) time was 79 minutes, close to the recommended[29] time of within 60 minutes.[30] The greater the number of telestroke consults to the MGH, the greater the number of tPA treatments observed. In addition to improvements in DTN time, MGH has demonstrated **improved diagnostic accuracy** and **reduced time to correct diagnosis** as part of its telestroke program.
Access to Care	**Time to Consult:** Recent results over the past two years show that over 95% of consultation requests are answered within five minutes.
Patient, Family and Caregiver Experience	**Patient Satisfaction (at community hospitals):** The program reports patient satisfaction rates above 90%.
Clinician Experience	**Clinician Satisfaction (at MGH):** On average, participating clinicians report high satisfaction rates (scoring above 4 on the Hub Satisfaction Survey) of 94% over the past two years for routine and urgent consults and 81% for emergency consults. **Clinician Confidence/Satisfaction (at community hospitals):** Consultation support by MGH neurologists bolsters spoke hospital clinicians' decision-making confidence, as the consulting MGH neurologist assumes responsibility for the recommendations.
Financial and Operational Impact	**Patient Retention (at community hospitals):** • **Routine or Urgent Cases:** Between 2018 and 2020, the percentage of routine teleneurology patients who remained in the spoke hospital as a result of consultation ranged from 89% to 95%. • **Emergency Cases:** For emergency teleneurology and telestroke patients, between 71% and 88% were able to be treated locally with consultation support over the same period. **Reduced Patient/Family Cost:** Costs are lower in community hospital settings, generating cost savings for patients and families.

Source: Data and content for this case study were provided by and used with permission from Massachusetts General Hospital.

Cityblock Health – Complex Care Coordination

CITYBLOCK HEALTH

STRATEGIC GOALS

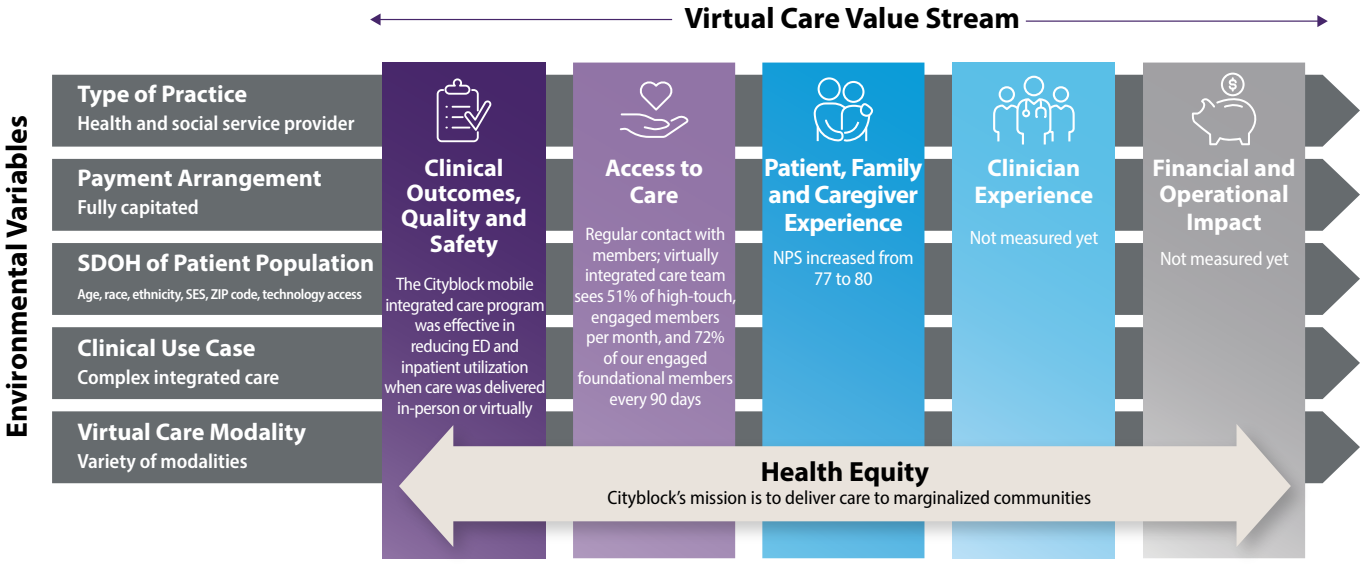
Cityblock implemented its virtually integrated care model in order to:

- Ensure continuity of complex care management for a diverse, older patient population during a pandemic.
- Maintain or lower cost of care for members by reducing avoidable ED visits and inpatient admissions.

DESCRIPTION

Cityblock Health is a tech-enabled provider of health care and social services to low-income and racially diverse populations. Founded in 2017, Cityblock contracts with payers to provide primary care, behavioral health care and social services to members with complex needs. One of Cityblock's unique virtual care models adopted during the COVID-19 pandemic, the mobile integrated care program, leverages a variety of modalities (including interprofessional consult, video and phone visits, SMS messaging, and in-home care) to deliver whole-person, complex care management to marginalized communities in New York, Massachusetts and Connecticut. Over half of the members who receive services through this model are over 60 years old, and more than half (59%) are women. Approximately 25% of members receiving services through the model identify their race or ethnicity as Black, 21% are white, 3% are Hispanic, 7% are multiracial, and 32% did not identify their race or ethnicity. Payers provide Cityblock an annual capitated payment for each member, and if Cityblock is able to manage its total membership's care for lower cost than projected, it keeps those savings. Cityblock assumes financial responsibility for medical expenses beyond the capitated payment rate.

FIGURE 12. CITYBLOCK VIRTUAL INTEGRATED CARE PROGRAM AND IMPACT SUMMARY



At the onset of the COVID-19 pandemic, Cityblock recognized the need to adapt its traditional care model and workflow to engage patients virtually to prevent disease spread and continue delivering care management to patients in the safety of their homes. To address this need, Cityblock developed and began implementing the mobile integrated care program for a subset of Cityblock members. In the early stages of this virtual approach, Cityblock sent members links to participate in video appointments; however, many members faced connectivity challenges, which resulted in high no-show rates. To address these barriers, Cityblock launched a pilot where they delivered computer tablets directly to members' homes.

The pilot quickly showed that tablets alone weren't sufficient to increase successful connection rates, as the tablet software proved to not be designed to meet the needs of many of their older members who require additional support to successfully connect with Cityblock clinicians. Cityblock ultimately achieved success in its virtual approach when it deployed emergency medical technician (EMT) teams with telehealth technology to members' homes, with the EMT acting as an in-home extender to the telehealth clinician. This hands-on approach helped bridge gaps in upfront solution design that had limited access for certain members, resulting in successful video visits between members and their Cityblock care team.

Cityblock's virtually integrated care team is comprised of a community health partner (with a similar background and training as a community health worker), nurse care manager, nurse practitioner or physician primary care provider, behavioral health therapist, and psychiatrist. The community health partner is responsible for checking in with the member via phone or text on an ongoing basis to understand their care plan progress and flag issues for the rest of the medical team as necessary. Members generally meet with a therapist for behavioral health support once a week via video visit. Medical visits are also delivered in a virtual manner, wherein a clinician connects to the member via video visit and the EMT is at the patient's home to help initiate the video visit, collect vitals, collect labs and conduct a physical exam, as appropriate.

PROGRAM IMPACT

VALUE STREAM	EVIDENCE OF PROGRAM IMPACT
 **Clinical Outcomes, Quality and Safety**	The Cityblock mobile integrated care program was effective in reducing ED and inpatient utilization when care was delivered in-person or virtually.
 **Access to Care**	**Regular Contact With Membership:** On average, the Cityblock's virtually integrated team sees 51% of high-touch, engaged members per month, and 72% of our engaged foundational members every 90 days.
 **Patient, Family and Caregiver Experience**	**NPS:** NPS increased from 77 to 80.
 **Health Equity**	Cityblock's mission is to "deliver personalized health services to marginalized communities [and] reduce disparities and rebuild trust between health care providers, social services organizations, and marginalized groups."[31] More information on Cityblock's mission and guiding principles can be found here.

Source: Data and content for this case study was provided by and used with permission from Cityblock Health.

V. Applying the Framework to New Digitally Enabled Care Programs

This section outlines how to apply the framework to new virtual care programs. The AMA recently published the Telehealth Implementation Playbook, Telehealth Quick Guide and Remote Patient Monitoring Implementation Playbook to aid practices considering adopting new virtual care programs. The Telehealth Implementation Playbook proposes 12 distinct steps that practices can take to support efficient, successful implementation of telehealth programs. The framework proposed in this report can support those practices in completing four of those 12 steps: Defining Success, Making the Case, Evaluating Success and Scaling.

FIGURE 13. STEPS IN AMA TELEHEALTH PLAYBOOK

Defining Success: The framework can help practices define the short- and long-term impact goals and associated metrics that will guide the design and implementation of the virtual care program. Understanding the strategic context for any virtual care program is the necessary first step in applying the framework to determine the potential programmatic impact. Based on the strategic goals of a given program, practices can then set impact goals or success benchmarks to help them evaluate the success of the program.

Making the Case: The framework can also be leveraged to develop a value impact estimate of a newly planned program to inform resourcing and investment decisions. These estimates are often necessary to gain organizational buy-in to fund new virtual care programs. Virtual care program leaders can use the framework to estimate how the proposed virtual care program can deliver value to their organization.

Evaluating Success: After program launch, practices can use the impact goals identified in the "Defining Success" step to measure the impact of the implemented program. In the evaluation stage, the framework can be used both to identify successes and to identify areas for improvement across the value streams.

Scaling: If a practice has found its virtual care program has delivered value for the organization and decides to scale the program up to serve more patients or cover more clinical areas, the framework can be used again to project potential future value generated by a larger program. Practices can revisit the impact goals defined in earlier steps in order to redefine success of a fully scaled virtual care program.

Illustrative Scenarios

The following scenarios describe six illustrative virtual care programs to demonstrate how the framework can be applied to a new program. In this section, the program descriptions and impact goals are illustrative and do not reflect real-world data. The programmatic narratives and impact goals included in these illustrative scenarios were informed by interviews with key stakeholders and with supporting evidence from relevant peer-reviewed, academic literature regarding virtual care programs similar to those described in each illustrative case example. At the end of each scenario, there are two appendix tables that include (1) examples of organizations with virtual care programs similar to the one described in the illustrative scenario provided and (2) supporting literature that was used to inform the development of each scenario.

Summerhill Hospital – RPM for Diabetes Management*

SUMMERHILL HOSPITAL'S STRATEGIC GOALS

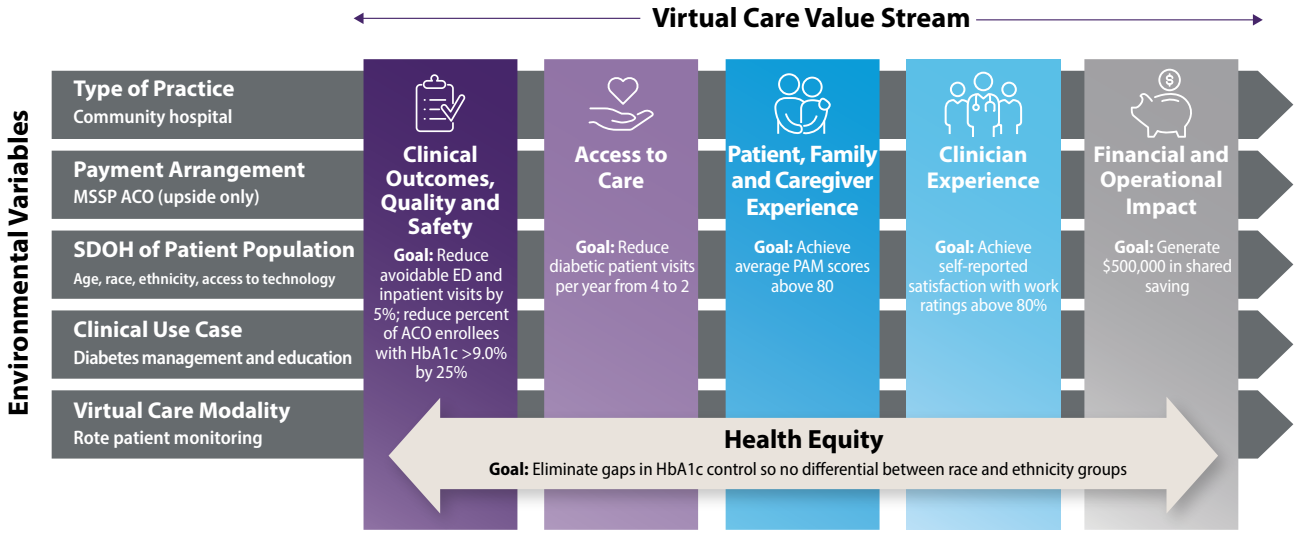
Summerhill Health System is planning to adopt a remote patient monitoring (RPM) program in order to:

- Improve performance on risk-based contracts by reducing total cost of care.
- Improve clinical outcomes for patients with diabetes.

DESCRIPTION

Summerhill Hospital, a 250-bed community hospital, is planning to partner with an RPM company to deploy a diabetes management program. Summerhill Hospital leads the Summerhill Health System Accountable Care Organization (ACO), a Medicare Shared Savings Program (MSSP) ACO.

FIGURE 14. SUMMERHILL HOSPITAL DIABETES MANAGEMENT RPM PROGRAM AND IMPACT TARGETS



Prior to deciding to launch the RPM program, Summerhill Hospital's avoidable hospital admissions rate related to diabetic complications was 50% higher than that of other hospitals in the region, which was negatively impacting its ability to generate shared savings in its MSSP ACO. To reduce avoidable admissions, Summerhill has decided to implement an RPM program for approximately 2,000 patients with type 2 diabetes; however, Summerhill lacks the information technology infrastructure and expertise to develop its own RPM program; therefore, hospital leadership has decided to partner with a vendor.

Summerhill Hospital's RPM vendor will provide patients with a connected glucometer that enables automatic, wireless transmission of glucose readings to a physician-led care team. The program also provides test strips and a mobile and web app, which serves as the platform for patients to track their blood sugar and other health indicators, view their care plan, receive health coaching, log food intake, and order test strips. Patients self-test their blood glucose daily, and a care team member reviews transmitted readings and follows up as needed with patients if their results show a deterioration in glycemic control. The care team also provides ongoing coaching through the app.

On a monthly basis, the RPM company sends a report to each enrolled patient's primary care provider with an update on their condition and glycemic control. In addition to the monthly reports, if there are health issues that arise, the company will contact the patient's primary care provider immediately.

As part of the design process, Summerhill identified that there were patients who would not have access to a smartphone, computer or broadband internet so the hospital decided to provide services directly to patients.

IMPACT GOALS

VALUE STREAM	PRIMARY DRIVER	RELEVANT MEASURES	IMPACT GOALS
Clinical Outcomes, Quality and Safety	Clinical quality and safety outcomes	Reduced avoidable ED and inpatient visits	Reduce avoidable ED and inpatient visits in the diabetic population by 5%
		Hemoglobin A1c (HbA1c) Poor control (>9%)	Reduce the number of ACO enrollees with HbA1c >9% by 25%
Access to Care	Availability of care	Patient travel time	Reduce visits for diabetic patients from four to two visits per year
Patient, Family and Caregiver Experience	Clinical experience	PAM	Achieve average PAM scores above 80
Clinician Experience	Work experience	Engagement and satisfaction with work	Achieve self-reported satisfaction with work ratings above 80%
Financial and Operational Impact	Indirect revenue	Savings on MSSP ACO	Generate $500,000 in additional savings through reductions in avoidable ED and inpatient utilization
Health Equity	Equity in clinical outcomes, quality and safety	Hemoglobin A1c (HbA1c) control rates by race and ethnicity	Prevent gaps in HbA1c control so that there are no differences in HbA1c control by race or ethnicity

EXAMPLES OF REMOTE PATIENT MONITORING PROGRAMS FOR DIABETES MANAGEMENT	
ORGANIZATION	**PROGRAM DESCRIPTION AND ASSOCIATED RESEARCH**
University of Mississippi (UMMC)	UMMC provides four-to-six-month RPM programs to patients with chronic illnesses, including diabetes, in coordination with a patient's primary care provider. A recent presentation on the program is available here. **Research:** Mississippi Diabetes Telehealth Network: A Collaborative Approach to Chronic Care Management
Livongo	Livongo, now part of Teladoc as of October 2020, offers a digital platform for RPM programs. **Research:** "Livongo Studies Leverage Proprietary Data and Remote Monitoring to Reveal Unique Diabetes Management Insights"
Virta	Virta, founded in 2014, provides real-time and technology-enabled access to physicians and health coaches. **Research:** Peer-reviewed papers and white papers
Omada	Omada Health is a digital care provider that empowers people to achieve their health goals through sustainable lifestyle change. **Research:** Peer-reviewed papers and white papers

Relevant Literature Supporting Illustrative Impact Estimates

CLINICAL OUTCOMES, QUALITY AND SAFETY

- A meta-analysis found that RPM programs reduce HbA1c levels by 0.55 compared with usual care.
- A survey of 25 health care organizations deploying RPM programs for a variety of use cases, including diabetes care, found that 38% reported reductions in hospital admissions and 25% reported reductions in readmissions and ER visits, respectively. Seventeen percent reported quantified cost reductions from these outcomes.

PATIENT, FAMILY AND CAREGIVER EXPERIENCE

- A study in 2018 found that patients experienced increases in PAM scores (67%) at the end of the RPM program study period.

* The entity referenced in this Illustrative Case is fictional. Individuals, business, events, and scenarios referenced are influenced by interviews and review of publicly available literature. Any resemblance to actual individuals, entities, or events is purely coincidental.

Grand Plains Community Hospital – Tele-Intensive Care Unit (Tele-ICU)*

STRATEGIC GOALS

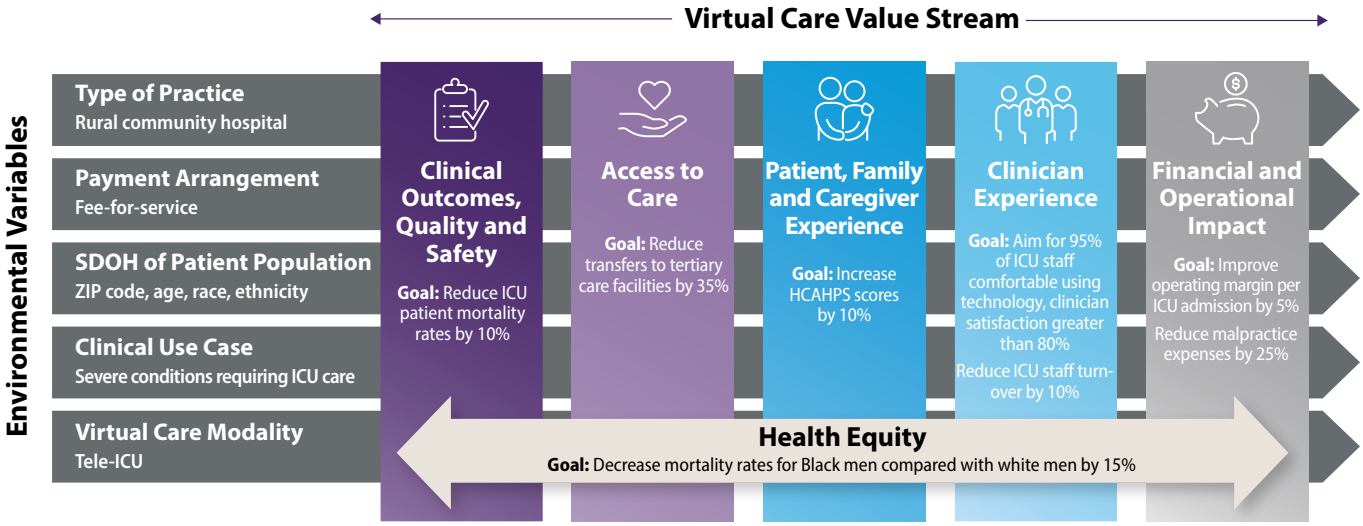
Grand Plains Community Hospital is planning to implement a tele-ICU program to:

- Retain more acute patients by reducing unnecessary transfers.
- Improve ICU patient outcomes.
- Address intensivist staffing shortages.

DESCRIPTION

Grand Plains Community Hospital, a small rural hospital affiliated with the Grand Plains Health System, is seeking to join a centralized tele-ICU program recently launched by the system's academic medical center.

FIGURE 15. GRAND PLAINS COMMUNITY HOSPITAL TELE-ICU PROGRAM AND IMPACT TARGETS



The hospital's 10-bed ICU serves a patient population primarily comprised of low-income, older adults. The hospital faces a shortage of intensivists and ICU nurses and often hires traveling nurses to meet demand. The system's academic medical center recently started offering a tele-ICU program to regional community hospitals, which would enable ICU staff at Grand Plains Community Hospital to connect via live video to a team of intensivists at Grand Plains University Medical Center who can remotely access patient data, conduct real-time monitoring of patient vital signs, and advise Grand Plains Community Hospital's ICU staff on clinical decision-making and evidence-based care.

IMPACT GOALS

VALUE STREAM	PRIMARY DRIVER	RELEVANT MEASURES	IMPACT GOALS
 **Clinical Outcomes, Quality and Safety**	Clinical quality and safety outcomes	Mortality rate	Reduce mortality among ICU patients by 10%
 **Access to Care**	Availability of care	Availability of ICU-level care in the community	Reduce transfers to tertiary facilities by 35%
 **Patient, Family and Caregiver Experience**	Clinical and/or technology experience	HCAHPS	Increase HCAHPS scores by 10%
 **Clinician Experience**	Technology experience	Reported ease of using technology, obtaining clinical information, consulting with virtual ICU intensivists	Aim for greater than 95% of ICU staff reporting comfort using the technology Aim for clinician satisfaction levels greater than 80% with support provided by tele-ICU
	Work experience	ICU staff turnover	Reduce ICU staff turnover by 10%
 **Financial and Operational Impact**	Direct revenue	Operating margin per ICU admission	Improve operating margin per ICU admission by 5%
	Direct expenses	Malpractice costs	Reduce annual ICU-related malpractice costs by 25%
 **Health Equity**	Equity in clinical outcomes, quality and safety	Relative reduction in mortality by race	Decrease mortality rates for Black men compared with those of white men by 15%

EXAMPLES OF TELE-ICU PROGRAMS	
ORGANIZATION EXAMPLES	**PROGRAM DESCRIPTION**
Dignity Health	The Dignity Health Telemedicine Network provides high-speed data lines and InTouch Health wireless remote robots to support physicians to quickly evaluate, diagnose and treat patients in the ICU. The program has been operational since 2014.
St. Luke's Health System	Launched in 2018, the St. Luke's Virtual Care Center offers tele-ICU services throughout Idaho and Eastern Oregon.
UMass Memorial Medical Center	UMass Memorial Medical Center's tele-ICU program has provided tele-ICU support to all three UMass Memorial Health Care system hospitals since 2007.
Penn Medicine	Penn E-lert eICU is an intensive care unit that provides support for critically ill patients located at the Hospital of the University of Pennsylvania, Penn Presbyterian Medical Center and Pennsylvania Hospital.

Relevant Literature Supporting Illustrative Impact Estimates

CLINICAL OUTCOMES, QUALITY AND SAFETY

- A 2013 study of 56 ICU units found that ICU mortality dropped by 26% and overall hospital mortality fell by 16%.
- A literature review on tele-ICUs found numerous studies citing higher rates of ICU staff adherence to critical care best practices.

FINANCIAL AND OPERATIONAL IMPACT

- Studies have found that tele-ICU programs reduce costs by $2,600 to $3,000 per patient.
- At UC Irvine Health, prior to tele-ICU implementation, average annual ICU-related malpractice costs totaled $6 million. After implementation of tele-ICU, annual malpractice costs dropped to less than $.5 million.

* The entity referenced in this Illustrative Case is fictional. Individuals, business, events, and scenarios referenced are influenced by interviews and review of publicly available literature. Any resemblance to actual individuals, entities, or events is purely coincidental.

BonaCura Children's Hospital – Urology Postoperative Video Visits*

STRATEGIC GOALS

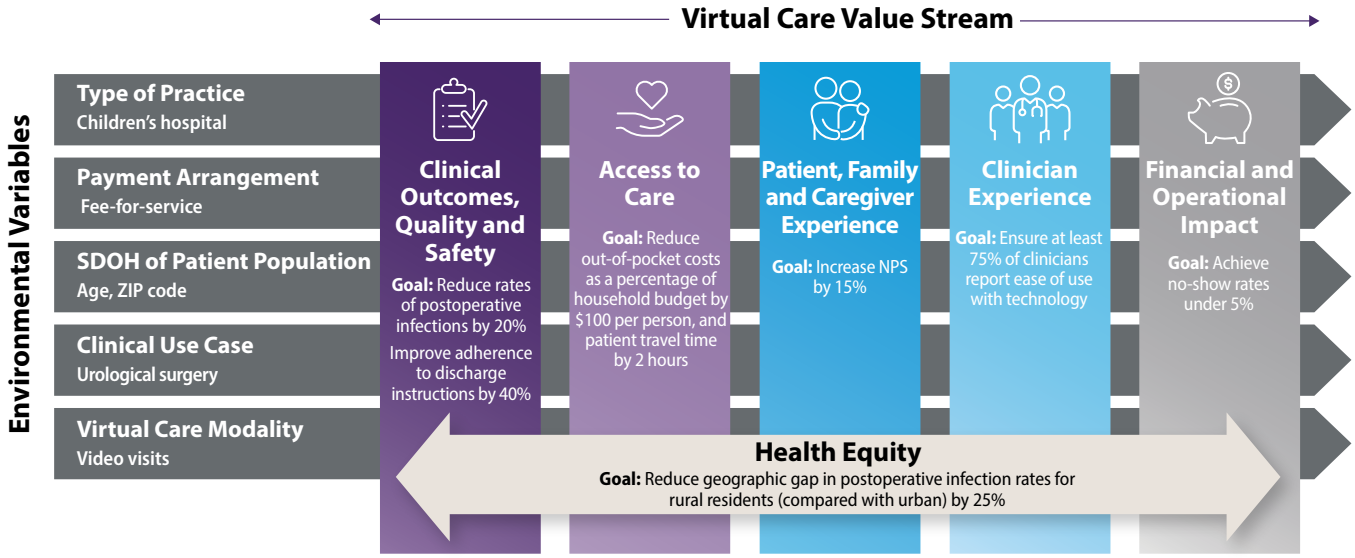
BonaCura Children's Hospital will utilize postoperative video visits in order to:

- Address inequities in postoperative outcomes for rural patients.
- Optimize clinical space and resources.
- Enhance patient/family experience by reducing out-of-pocket costs and unnecessary travel.

DESCRIPTION

BonaCura Children's Hospital is a large pediatric specialty hospital serving a broad catchment area covering both urban and rural geographies. The BonaCura Urology Department has decided to adopt video visits to provide postoperative care, particularly for patients located in rural areas.

FIGURE 16. BONACURA UROLOGICAL POSTOPERATIVE FOLLOW-UP PROGRAM AND IMPACT TARGETS



BonaCura conducts approximately 1,200 urological surgeries annually. A claims analysis conducted by the hospital's research department found that a significant proportion of BonaCura's patients were not coming back to the hospital for postoperative follow-up visits. The analysis revealed that a greater percentage of rural patients were experiencing postoperative complications and returning to the hospital for subsequent postoperative care compared with urban patients. To address this disparity, BonaCura has decided to implement a re-engineered, technology-enabled discharge protocol.

Before discharge, the patient's physician assesses whether the patient's family member or caregiver has the necessary devices and broadband connection to participate in post-discharge video visits for follow-up care. If they can participate, the physician initiates consent and scheduling for the follow-up video visit. Those who lack the necessary technology to participate in virtual care will be provided with a connection to local resources that can support their efforts to acquire needed technologies.

Two or three days after discharge, a nurse or medical assistant will reach out to the family member or caregiver via telephone to review discharge instructions, remind them of the patient's upcoming video visit, and answer any technology-related questions. During the video visit, a clinician will assess the patient's postoperative status with the help of a family member or caregiver and address any issues or complaints related to the surgery. After the video visit, the physician will contact the patient's pediatrician to update them on their patient's status.

IMPACT GOALS

VALUE STREAM	PRIMARY DRIVER	RELEVANT MEASURES	IMPACT GOALS
 **Clinical Outcomes, Quality and Safety**	Clinical quality and safety outcomes	Postoperative infections requiring ED visit or inpatient readmission	Reduce rates of postoperative infections requiring ED visit or inpatient readmission within 90 days by 20%
	Clinical processes	Adherence to evidence-based guidelines	Improve adherence to discharge instructions by 40%
 **Access to Care**	Affordability of care	Out-of-pocket costs as a percentage of household budget	Reduce patient-reported out-of-pocket costs for follow-up care (including travel, time off work, etc.) by $100 per person
	Availability of care	Patient travel time saved	Reduce patient travel time by two hours
 **Patient, Family and Caregiver Experience**	Clinical and/or technology experience	NPS	Increase NPS by 15%
 **Clinician Experience**	Technology experience	Reported ease of using technology	Ensure that at least 75% of clinicians find the technology easy to use
 **Financial and Operational Impact**	Operational efficiencies	No-show rate	Achieve no-show rates of under 5%
 **Health Equity**	Equity in clinical outcomes, quality and safety	Relative reduction in adverse postoperative outcomes by geography	Reduce the geographic gap in postoperative infection rates for rural versus urban residents by 25%

EXAMPLES OF VIRTUAL UROLOGICAL POSTOPERATIVE FOLLOW-UP PROGRAMS	
ORGANIZATION EXAMPLES	**PROGRAM DESCRIPTION**
Arkansas Children's Hospital	The Arkansas Children's Hospital Urology Department delivers postoperative follow-up telehealth visits for patients located in Springdale, Jonesboro, Texarkana and Fort Smith.
Mayo Clinic	At the onset of the COVID-19 pandemic, the Mayo Clinic Center for Connected Care launched a program to enable video and telephone visits for pediatric urology.
Mount Sinai	Mount Sinai's Department of Urology conducts telehealth primarily for postoperative follow-up and has scaled up the program during the COVID-19 pandemic to address select other visit types.

Relevant Literature Supporting Illustrative Impact Estimates

ACCESS TO CARE

- In a systematic review of 21 studies evaluating telehealth use in the postoperative setting, round-trip miles and travel time saved directly translated into monetary savings for families, ranging from $36 to $357 saved on travel.
- A 2020 study on the use of telehealth for postoperative video visits found that less work and school were missed by parents and children, respectively. The opportunity costs associated with an in-person visit were computed at $23.75 per minute of face time with a physician, compared with $1.14 for a virtual visit.
- A 2020 study assessed the impact of introducing video visits in a tertiary academic pediatric urology practice, serving primarily rural patients during the COVID-19 pandemic. On average, 2.25 hours of travel time was saved per patient.

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Green Street Dermatology Associates – Teledermatology*

STRATEGIC GOALS

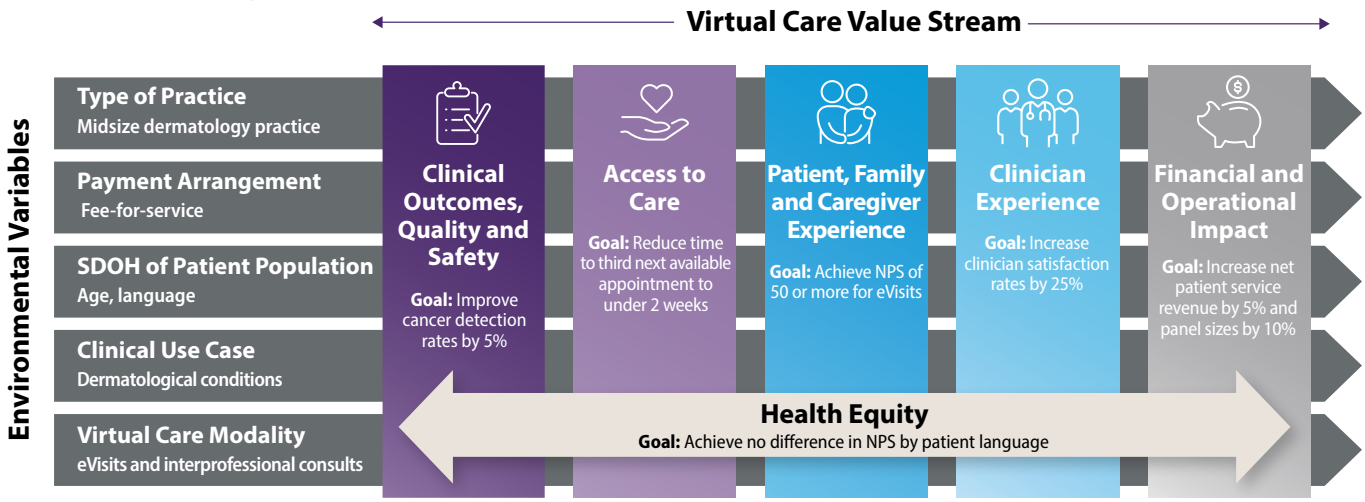
Green Street Dermatology Associates is adopting teledermatology to:

- Attract/acquire new patients and retain existing patients.
- Improve access and timeliness of care by mitigating barriers such as transportation, child care and language.
- Facilitate appropriate consultation and enhanced referral with local primary care providers.

DESCRIPTION

Green Street Dermatology Associates is a midsize specialty practice that is located in an urban area and conducts about 6,500 visits annually. Green Street recently decided to adopt teledermatology capabilities (eVisits and interprofessional consultations) after patients and primary care practices in the area reported frustration with wait times for nonurgent dermatological consultations.

FIGURE 17. GREEN STREET DERMATOLOGY ASSOCIATES TELEDERMATOLOGY PROGRAM AND IMPACT TARGETS



The practice is planning to implement eVisits, which enable patients to send a photo of their dermatological condition or complaint directly to their dermatologist through the practice's online, secure patient portal. The practice's dermatologists then review the images and provide treatment guidance through a portal message or recommend an in-person visit for further consultation. The practice has hired an interpreter to assist with store-and-forward exchanges and ensure that all incoming and outgoing portal communication messages are translated for patients whose first language is not English. In addition to store-and-forward, the practice has also decided to start providing interprofessional consultations to primary care providers in their network, connecting with them over video to provide live diagnostic support and review pertinent imaging sent by the primary care office.

IMPACT GOALS

VALUE STREAM	PRIMARY DRIVER	RELEVANT MEASURES	IMPACT GOALS
Clinical Outcomes, Quality and Safety	Clinical quality and safety outcomes	Improvement in disease detection	Improve detection rate of cancers by 5%
Access to Care	Availability of care	Time to third next available appointment	Reduce wait times to third next available appointment to under two weeks
Patient, Family and Caregiver Experience	Clinical and/or technology experience	NPS	Achieve NPS for eVisit service of 50 or higher
Clinician Experience	Work experience	Engagement and satisfaction with work (self-reported)	Increase clinician satisfaction rates by 25% on Green Street's clinician satisfaction survey
Financial and Operational Impact	Direct revenue	Net patient service revenue	Increase net patient service revenue by 5% as a result of new patient growth
	Indirect revenue	Dermatologist panel size	Increase panel sizes by 10%
Health Equity	Patient experience	NPS by language	Achieve no difference in NPS by patient language

EXAMPLES OF TELEDERMATOLOGY PROGRAMS	
ORGANIZATION EXAMPLES	**PROGRAM DESCRIPTION**
University of Connecticut	UConn Health has offered teledermatology since 2015 and covers patients across Connecticut and three clinics of Penobscot Community Health Center in northern Maine.
Kaiser Permanente	The Permanente Medical Group has offered teledermatology to patients in Northern California for over 16 years.
RubiconMD	Founded in 2013, RubiconMD provides a platform to enable interprofessional consults for over 125 specialties, including dermatology.

Relevant Literature Supporting Illustrative Impact Estimates

CLINICAL OUTCOMES, QUALITY AND SAFETY

- A 2012 study found that teledermatology consultations resulted in a recommendation of initiation or discontinuation of a medication in 67.5% of the cases.
- Kaiser Permanente found that when dermatologists had the chance to look at well-photographed skin lesions, they were able to identify nearly 10% more cancers with almost 40% fewer referrals to the dermatology department.

ACCESS TO CARE

- A 2020 study found that teledermatology led to a 78% reduction in the waiting time for in-person appointments when compared with usual care.

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High Rock OBGYN Associates – Prenatal/Postpartum Video Visits*

STRATEGIC GOALS

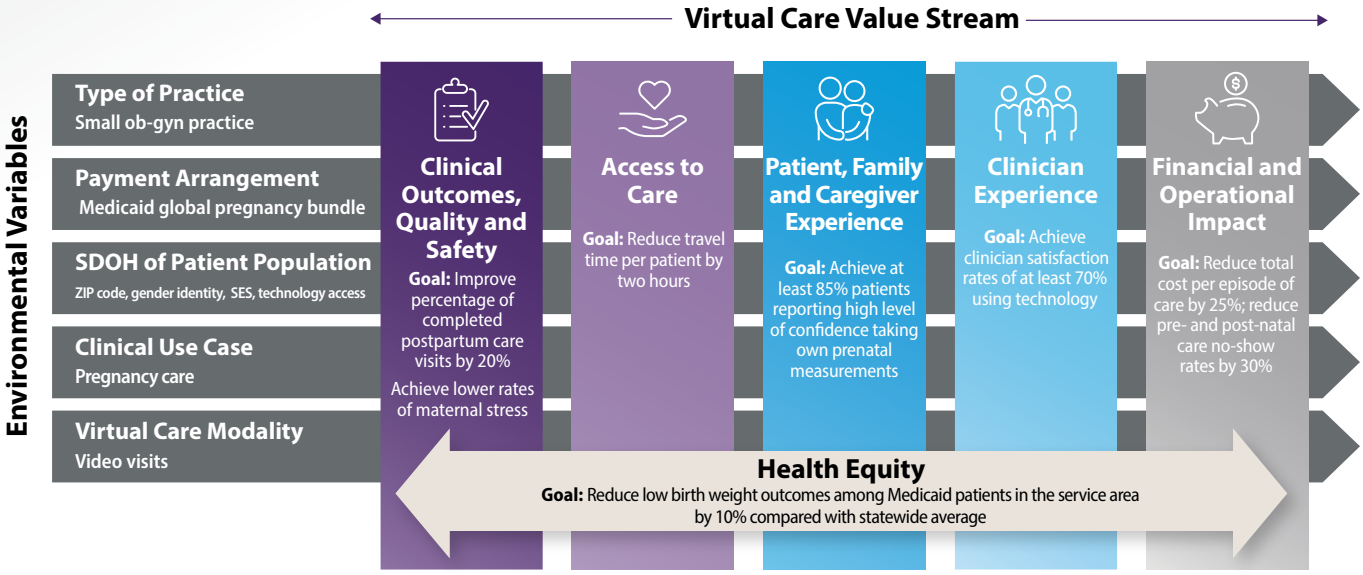
High Rock OBGYN Associates adopted video visit capabilities in order to:

- Improve clinical and quality outcomes among obstetrics patients.
- Improve patient access and timeliness of care for women who do not have easy access to reliable transportation.
- Reduce no-show rates while increasing the number of touchpoints with obstetrics patients.
- Reduce risk by reducing total cost of care for obstetrics patients.

DESCRIPTION

Early in the peak pandemic period in 2020, North Carolina's Medicaid program temporarily enabled ob-gyns to deliver perinatal care via telehealth. After this flexibility was enabled, the program reported notable increases in telehealth claims for perinatal care across the state. High Rock OBGYN Associates, a small ob-gyn practice located in a rural, agricultural area, has decided to start leveraging synchronous video visits during the COVID-19 pandemic in light of this new flexibility. It is using video visits to connect with Medicaid-enrolled women and ensure continuity of care through the course of their pregnancy. The practice is paid by the state Medicaid program according to a bundled payment model that encompasses pregnancy-related antepartum care, labor and delivery, management of labor including fetal monitoring, delivery and uncomplicated postpartum care until six weeks postpartum.

FIGURE 18. HIGH ROCK PRENATAL/POSTPARTUM VIRTUAL CARE PROGRAM AND IMPACT TARGETS



High Rock seeks to continue offering the delivery of routine pregnancy care (not requiring a physical exam) via video visit as an alternative to in-person visits after the COVID-19 pandemic in order to address high rates of adverse pregnancy outcomes within the practice's service area. High Rock's service area has higher rates of low and very low birth weight births than the statewide average, particularly among Medicaid-enrolled pregnant women. High Rock hopes that offering video visits may be able to eliminate inequities in access to care for Medicaid-enrolled women in the service area. In addition to solely offering video visits, they are also planning to employ a hybrid telehealth/home visit model that involves sending a medical assistant or nurse practitioner to the patient's home to provide technology and connectivity support for a simultaneous video visit appointment and/or to conduct critical prenatal services such as ultrasounds, vaccinations, laboratory tests and physical examinations.

IMPACT GOALS

VALUE STREAM	PRIMARY DRIVER	RELEVANT MEASURES	IMPACT GOALS
 **Clinical Outcomes, Quality and Safety**	Clinical quality and safety outcomes	Percentage of deliveries of live births that had a postpartum visit on or between 21 and 56 days after delivery (NQF# 1517)	Improve the number of deliveries that received a postpartum visit by 20%
		Maternal stress	Achieve lower rates of maternal stress compared with usual care
 **Access to Care**	Availability of care	Median travel time per patient	Reduce travel time per patient by two hours
 **Patient, Family and Caregiver Experience**	Clinical and/or technology experience	Patient-reported confidence and satisfaction with care	At least 85% reporting high level of confidence taking own prenatal care measurements
 **Clinician Experience**	Technology experience	Reported ease of using technology and obtaining clinical information	Achieve clinician satisfaction rates with the new technology of at least 70%
 **Financial and Operational Impact**	Direct expenses	Total cost per episode of care	Reduce the total cost per episode of care by 25%
	Operational efficiencies	No-show rate	Reduce pre- and postnatal care no-show rates by 30%
 **Health Equity**	Equity in clinical outcomes, quality and safety	Relative reduction in low birth weight births among Medicaid population	Reduce rate of low birth weight outcomes among Medicaid patients in the service area as compared with the statewide average outcomes for all patients by 10%

EXAMPLES OF MATERNAL HEALTH VIRTUAL CARE PROGRAMS	
ORGANIZATION EXAMPLES	**PROGRAM DESCRIPTION**
Mayo Clinic Health System: OB Nest	The OB Nest program, developed in 2016 by the Mayo Clinic Department of Obstetrics and Gynecology in collaboration with the Center for Innovation, provides frequent check-in visits with home monitoring equipment to monitor fetal and maternal health during pregnancy. **Research:** A recent study on the outcomes generated by the OB Nest model is available here.
Maven Clinic	Founded in 2014, Maven is a telemedicine provider for women's and family health care. Through on-demand access to care advocates and a network of more than 1,700 clinicians across 20 specialties, Maven's programs include fertility, maternity, early pediatrics and return-to-work, among others.
University of Arkansas	The High Risk Pregnancy Program, formerly ANGELS, is a joint program of the University of Arkansas for Medical Sciences (UAMS) College of Medicine, the Arkansas Department of Human Services and the Arkansas Medical Society. The program offers consultation by UAMS board-certified maternal-fetal medicine physicians using telemedicine technology.
Wildflower Health	Wildflower connects women and families to better care by breaking down silos among providers, payer and best-in-class partners. **Research:** Peer-reviewed research and white papers

Relevant Literature Supporting Illustrative Impact Estimates

CLINICAL OUTCOMES, QUALITY AND SAFETY

- A 2019 study found that prenatal stress was lower among OB Nest participants at 14 weeks and at 36 weeks of gestation than among patients receiving usual care. The study also found that the OB Nest model increased nursing time by over an hour compared with those receiving usual care.

PATIENT, FAMILY AND CAREGIVER EXPERIENCE

- A 2018 study found that patients who exchanged prenatal care measurements with their care team reported an increased sense of control, confidence and reassurance.

FINANCIAL AND OPERATIONAL IMPACT

- A 2016 study testing an alternative prenatal schedule with reduced visits supplemented with mobile technology and home monitoring led to a cost savings of $499.14 per pregnancy.

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Viridian Family Practice – Primary Care Video Visits*

STRATEGIC GOALS

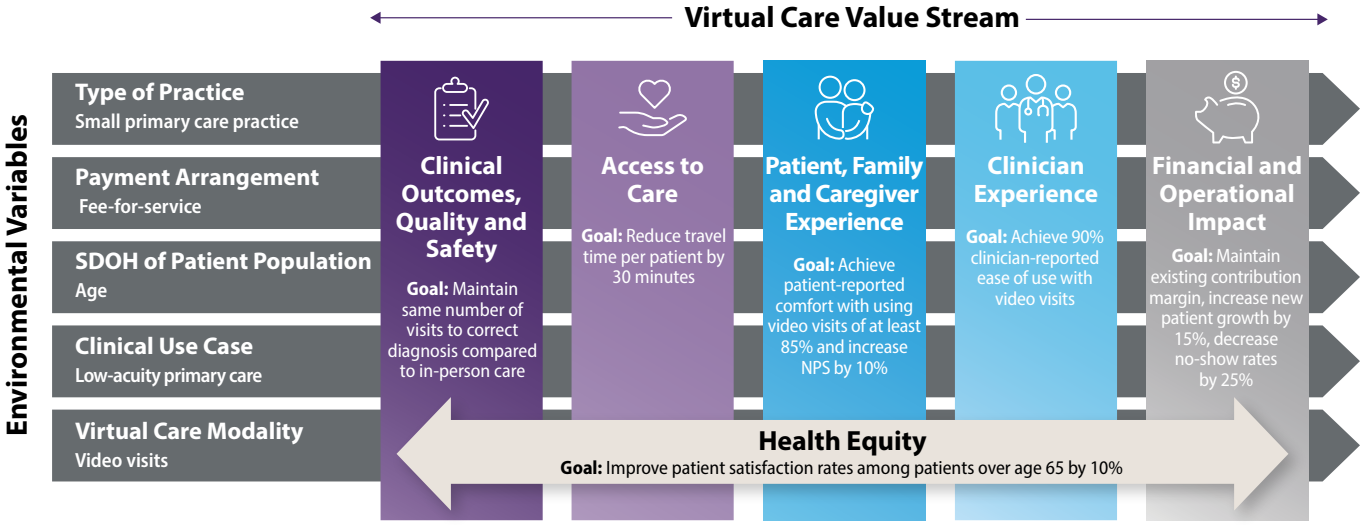
Viridian Family Practice has decided to adopt primary care video visits in order to:

- Attract/acquire new patients.
- Improve patient access and timeliness of care.

DESCRIPTION

Viridian Family Practice is a small, independent primary care practice located in a suburban area. With many primary care–focused digital health companies starting to offer primary care services via telehealth, the practice has decided to start offering patients the option of scheduling a video visit to address low-acuity clinical issues.

FIGURE 19. VIRIDIAN FAMILY PRACTICE PRIMARY CARE VIRTUAL CARE PROGRAM AND IMPACT TARGETS



The practice's annual patient volume is approximately 7,000. The office is staffed by a physician, two nurse practitioners, two medical assistants and office staff. The practice has decided to organize telehealth alongside in-person service delivery by scheduling "telehealth-only days" wherein the physicians and nurse practitioners alternate days when they conduct only video visits or in-person appointments. To determine which cases should be triaged for a video visit, the practice will utilize a clinical appropriateness protocol that provides a decision matrix to help office staff determine the types of patient issues for which a video visit may be offered to the patient as an alternative to an in-person appointment. For example, the protocol permits the initiation of video visits to conduct medication adjustments, chronic disease management and counseling, and assessment of select conditions where a physical exam is not necessarily required, such as nonurgent behavioral health care. Ambiguous cases are reviewed by the practice's nurse practitioners.

IMPACT GOALS

VALUE STREAM	PRIMARY DRIVER	RELEVANT MEASURES	IMPACT GOALS
Clinical Outcomes, Quality and Safety	Clinical quality and safety outcomes	Number of visits to correct diagnosis	Maintain the same number of visits to correct diagnosis as in-person care
Access to Care	Availability of care	Median travel time per patient	Reduce average travel time per patient by 30 minutes
Patient, Family and Caregiver Experience	Clinical and/or technology experience	Patient-reported comfort and ease of use	Achieve total patient-reported comfort with effectively using the video visit platform of at least 85%
		NPS	Increase scores by 10%
Clinician Experience	Technology experience	Ease of use	Ensure that 90% of Viridian's clinicians find the video visit platform easy to use
	Work experience	Engagement and satisfaction with work	Improve engagement and satisfaction with work by 30%
Financial and Operational Impact	Direct revenue	Direct contribution margin	Maintain existing contribution margin
	Indirect revenue	New patient acquisition	Increase new patient growth by 15%
	Operational efficiencies	No-show rate	Decrease no-show rate by 25%
Health Equity	Equity in patient, family and caregiver experience	Relative improvement in satisfaction with care for older adults	Improve patient satisfaction rates among individuals over age 65 by 10%

EXAMPLES OF ORGANIZATIONS WITH SIMILAR PROGRAMS	
ORGANIZATION EXAMPLES	**PROGRAM DESCRIPTION**
Walmart	Walmart's Doctor on Demand program has offered medical and behavioral health visits to patients in Colorado, Minnesota and Wisconsin since 2019.
Aledade	In March 2020, Aledade and partner Updox launched a comprehensive telehealth solution to Aledade's national network of physician-led ACOs.
Teladoc	Founded in 2002, Teladoc offers virtual primary care services to members across the United States and other countries.
Kaiser Permanente	Kaiser began offering telehealth in 2016. Target conditions include cold and flu symptoms, minor injuries, and follow-up care for chronic conditions.
OneMedical	OneMedical offers subscribers 24/7 access to video chat and the ability to digitally renew prescriptions and communicate with clinicians via app.
Doctor on Demand	Founded in 2012, the company provides access to virtual appointments to address primary, behavioral and urgent care needs.

Relevant Literature Supporting Illustrative Impact Estimates

CLINICAL OUTCOMES, QUALITY AND SAFETY

- The NCQA Taskforce on Telehealth Policy found that nonurgent complaints in primary care settings, diagnostic accuracy and the likelihood of diagnostic error appear to be roughly comparable in tele-diagnosis versus face-to-face encounters.
- A 2014 study found that patients who used virtual primary care services were less likely to have a follow-up visit to any setting, compared with those patients who visited a physician's office or ED.

PATIENT, FAMILY AND CAREGIVER EXPERIENCE

- A 2019 study found that 90% of patients were confident in the care they received through video visits.

FINANCIAL AND OPERATIONAL IMPACT

- A 2019 study found that virtual primary care generated cost savings without an associated increase in overall follow-up rates or antibiotic use when compared with in-person urgent or primary care.

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VI. Opportunities for Health Care Stakeholders to Realize the Full Potential of Digitally Enabled Care

There are actions that health care stakeholders, including payers and policymakers, can consider taking to encourage and enable the adoption of virtual care among clinicians, hospitals, clinics and other types of providers and overcome the challenges that are currently slowing the evolution to digitally enabled care models.

Unpredictable Virtual Care Coverage and Payment Environment

CHALLENGE

The lack of reliable coverage and payment for virtual care delivery remains a major impediment for clinicians seeking to build digitally enabled care models. Though most payers temporarily expanded their telehealth coverage and payment policies during the COVID-19 pandemic, many have not been clear about which policies will be made permanent.

OPPORTUNITY

Payers and policymakers can help overcome health care professionals' concerns by supporting long-term fair and equitable payment that supports sustainability for proven virtual care services in fee-for-service (FFS) environments. For Medicare, policymakers should seek input and analyses from physicians and other health professionals regarding experience with temporary virtual care service flexibilities and use this input as the basis for any decisions about which services can continue to be delivered remotely in a clinically appropriate manner after the end of the pandemic. At the state level, policymakers should continue to support coverage of services provided via telehealth on the same basis as comparable services provided in person.

Supporting Virtual Care in Both Fee-for-Service and Value-Based Payment Environments

CHALLENGE

Though the health care payment system continues to shift from FFS to value-based payment models, most health care professionals will "live in both worlds" for the foreseeable future. Given this, it will be important to pay for and support virtual care across payment arrangements to enable the development of digitally enabled care models. FFS payment models can pose challenges to designing and implementing digitally enabled care models if certain virtual care modalities, services or clinician types are not covered telehealth services. As demonstrated in the case studies described in this report, value-based arrangements, especially those further along the risk spectrum, may allow clinicians more financial flexibility to deploy virtual care options as part of digitally enabled care without concern for direct payment of virtual care services.[32] Ensuring coverage for virtual care services in FFS models while maintaining flexibility in value-based models will be key to enabling adoption of digitally enabled care in multiple payment environments. In addition to supporting virtual care, value-based payment models must also promote equitable care for all patients and create incentive structures that work to eliminate health inequities for populations with greater needs.

OPPORTUNITY

As noted above, it will be important for payers and policymakers to support long-term fair and equitable payment for clinicians to sustain virtual care services in FFS environments. In addition, as value-based models become more prominent, there should be significant flexibilities allowed for incorporating the full range of virtual care modalities (including those outside of video) into digitally enabled care models. For example, Medicare implemented an expanded benefit in 2018 to allow beneficiaries who are associated with a Next Generation ACO to receive telehealth services from their homes, regardless of geographic location.[33] Properly aligning incentives for widespread virtual care adoption and seamless integration with in-person care is crucial and should be a priority.

Insufficient Health Services Research Regarding Value of Virtual Care

CHALLENGE

Given the novelty of many virtual care modalities and the slow adoption of these tools prior to the COVID-19 pandemic, there is a lack of conclusive evidence regarding the clinical impact (e.g., quality and outcomes), financial impact (e.g., impact on total cost of care) and other impacts (e.g., impact on physician burnout) that virtual care capabilities generate with reference to specific contexts and care models. Further clinical and health services research is needed to establish and grow this body of evidence in order to sustain and continue adoption of virtual care models.

OPPORTUNITY

Policymakers should provide funding and support to organizations, such as the NIH Institutes and the Agency for Healthcare Research and Quality (AHRQ), to further define the value of virtual care across a range of environmental contexts, use cases and care models. Clinicians should be consulted as to what guidance will encourage clinician adoption.[34]

Limited Existing Metrics to Account for the Future of Virtual Care

CHALLENGE

A robust framework for measuring the value of virtual care should be based on measures that are tailored to the virtual care context. This will require adjustments to existing measures that were developed in relation to traditional in-person care delivery models and the development of new measures. As these adjustments are made and new measures designed, it will be important to acknowledge that although the use of virtual care increased dramatically in response to the COVID-19 pandemic, the realities of "pandemic times" may not hold true in "non-pandemic times."

OPPORTUNITY

To further aid clinicians and other stakeholders in measuring the value of virtual care in the future, quality measure developers and stewards should consider updating and, where possible, streamlining these metrics to better measure the value of virtual care and recognize the massive shift toward this new mode of care delivery that has occurred recently. Measure endorsers such as the National Quality Forum (NQF) should support standards for measuring the quality of virtual care, and measure stewards such as AHRQ, the NCQA and the Centers for Medicare & Medicaid Services (CMS) should adapt their measures to accommodate digitally enabled care models. In addition, payers should ensure that cost and quality measures used in pay-for-performance or value-based payment programs, for example CMS' Merit-based Incentive Payment System (MIPS) program, are evaluated and updated as needed to reflect the shift toward digitally enabled care.

Limited Ability for Physicians to Practice Virtual Care Across State Lines

CHALLENGE

A major attribute of virtual care is the ability to treat patients anytime, anywhere; to that end, virtual care can be a critical tool to address severe physician shortages in many regions of the United States. However, professionally licensed clinicians in most cases are limited to practicing in the state(s) where they are licensed. Policies governing telehealth and physician licensure vary widely across the country. Some states provide exceptions to allow for cross-border delivery of health care in limited circumstances, while others ban it entirely.[35] During the COVID-19 pandemic, many states introduced temporary flexibilities that enabled clinicians to more easily practice across state lines, though it is likely that these flexibilities will sunset when the pandemic ends.[36]

OPPORTUNITY

To better enable physicians to practice across state lines in the long term, states can consider joining the Interstate Medical Licensure Compact (IMLC), which offers an expedited licensing pathway for physicians who seek to practice in multiple states; as of the time of this publication, 30 states, the District of Columbia and the territory of Guam were signatories to the IMLC.[37] In addition, policymakers can continue to seek solutions that enable physicians to practice across state lines safely and appropriately and in accordance with state oversight of physician licensure and telehealth.

Critical Need to Center Historically Marginalized Patients in Design, Evaluation and Implementation of Virtual Care

CHALLENGE

Communities historically marginalized by the health care system, including Black, Indigenous, People of Color, Immigrant, LGBTQ+ and People With Disabilities, have experienced the perpetuation and exacerbation of inequities in their access to care and the quality of care they receive. It is critical to take an upstream approach to understanding the drivers of these inequities in access and quality, including technology device access, connectivity and poor usability. First and foremost, we must name and address the root causes of these inequities: exclusionary design that fails to center virtual care solution development on historically marginalized communities upfront, as well as the impact of systemic racism and oppression on resource allocation to marginalized groups that has resulted in inequitable infrastructure development and economic and social system exclusion. Naming and addressing these root causes are foundational to AMA's health equity strategy, and are central to the "Ensure Equity in Innovation" approach.

OPPORTUNITY

To ensure that health equity is at the center of future virtual care research design, evaluation and implementation, health care stakeholders and advocates can take the following steps:

- Engage historically marginalized patients and innovators early, upfront and often, and invite them to reframe the definition and assessment of the "value" associated with virtual care. This is a critical first step in changing inaccurate dominant narratives, giving power and shifting power to marginalized communities, and advancing an antiracism praxis in the health care innovation industry.[38]
- Draw on community-provided data in order to present a comprehensive and holistic picture of the inequities in virtual care access and quality.
- Discuss and address the upstream causes that drive the inequities in virtual care access and quality. Upstream causes include exclusionary design that fails to center virtual care solution development on historically marginalized communities early and upfront. Upstream causes also include the impact of systemic racism and oppression on resource allocation to marginalized groups that has resulted in inequitable infrastructure development and economic and social system exclusion. These upstream causes ultimately lead to downstream inequities, including lack of access to technology devices, connectivity, and usability and accessibility challenges.
- Provide a complete set of recommendations for policymakers, payers and other influencers of the health system to advance equity in virtual care at both the driver and upstream levels. An initial set of advocacy opportunities is below:
  - Target the upstream causes at the structural/policy level to address fundamental economic inequities.
  - Sustain and standardize universal telehealth coverage, inclusive of telephonic visits.
  - Provide equitable payment and parity for telephonic and in-person services.
  - Ensure security, privacy and interoperability centered on marginalized patients.
  - Protect the Affordable Care Act and other intersecting policies to ensure access and coverage.
- In parallel with upstream-focused advocacy, address immediate social needs through collaboration with community-based services and resources (e.g., community health centers, YMCAs, libraries, community health workers), the technology industry, and other resource providers to support access to and use of technology and broadband connectivity.

In addition, it is critical to highlight and support emerging innovations created by proximate leaders from marginalized communities focused on virtual care that centers equity for those communities.[viii] Below are selected initiatives, efforts and solutions that are advancing equitable virtual care:

INITIATIVE/SOLUTION	DESCRIPTION
Telemedicine for Health Equity Toolkit	A toolkit developed in partnership between the Center for Care Innovations, University of California - San Francisco Center for Vulnerable Populations and The Commonwealth Fund to provide background information as well as concrete guidance relevant to safety-net health care systems looking to initiate, expand or improve their telemedicine programs.
Health DesignED Center at Emory University	The Health DesignED team uses health expertise, design thinking and agile practices to prototype high-quality, equitable, tech-enabled acute care. They collaborate with innovators to support the evaluation of new products and practices by leveraging Emory Healthcare's pre-hospital footprint and five diverse EDs as a network of Test Beds. Once innovations have a record of improving quality and equity in patient care, they then support the rapid dissemination and scaling of the innovation to the populations that need them most.
Howard University College of Medicine 1867 Health Innovations Project	1867 Health Innovations Project is an innovation program that supports researchers, innovators, entrepreneurs and corporate partners who possess a desire to tackle complex health challenges confronting medically underserved communities.
HealthTech4Medicaid's Call for Telehealth Equity	HealthTech4Medicaid (HT4M) is on a mission to radically change the pace of innovation in Medicaid, improving quality and access to care for people who need it most. HT4M's Call for Telehealth Equity campaign focuses on enabling telehealth access to improve the lives of 1 million people in communities of color across the country.
Culture Care	Culture Care connects Black women with trusted physicians via virtual care.
FOLX Health	FOLX Health is a telehealth company designed by and offered to queer and trans people.

[viii] For more information, please read the article in the Stanford Social Innovation Review here.

Appendices

Appendix 1. Report Methodology

The AMA and Manatt Health jointly developed this report and the framework by conducting a high-level literature scan and a series of stakeholder interviews.

Literature Scan: A scan of relevant literature was conducted in order to understand the body of evidence regarding measuring the value of virtual care, gather evidence regarding components of the framework and identify gaps in the literature. The teams surveyed available literature primarily published in the United States between 2000 and 2020 from medical and economic research databases as well as articles on the open internet using relevant search terms (e.g., virtual care, telehealth, telecare, telemedicine, RPM, e-visit, portal communications, interprofessional consult, store-and-forward, return on investment, business case, value, impact, cost-effectiveness).

In total, nearly 100 documents fit the search parameters and were included in the scan. Studies from high-impact journals and those published within the past 10 years were prioritized for inclusion. The scan was not intended to be a systematic review of all telehealth literature, but rather to provide a research background to test and revise the framework. Key findings uncovered through the scan are included in Appendix 2.

Stakeholder Interviews: The AMA and Manatt Health teams conducted more than 20 interviews with a diverse set of health care organizations (e.g., hospitals, health systems, small group practices, federally qualified health centers[ix]) and thought leaders in the virtual care space in order to:

- Understand interviewees' recent experience with virtual care and how they perceive virtual care will impact value within their practices and institutions.
- Test an initial draft framework that seeks to explore how virtual care drives value for health care delivery organizations and patients.
- Gather any relevant data or information to inform case study development.

Interviewee feedback, used with permission, informed the final version of the framework outlined in this report. A full list of interviewees can be found below.

[ix] As noted earlier in this report, the AMA and Manatt team was limited in the number of organizations that could be interviewed.

INTERVIEWEES	AFFILIATION
Nick Bartz, MBA, Vice President, Business Intelligence Emily Maxson, MD, Chief Medical Officer Shelley Overholt, MD, Vice President, ACO Performance and Operations	Aledade
Ashlie Hilbun, EdD, Senior Vice President/Chief Strategy Officer	Arkansas Children's
Sylvia Romm, MD, Interim Health Lead, Virtual Care Bridget Halligan, BA, Director, Brand Marketing and Communications	Cityblock Health
Ateev Mehrotra, MD, Associate Professor of Health Care Policy, Department of Health Care Policy	Harvard Medical School
Todd Nelson, MBA, Director, Partner Relationships and Chief Partnership Executive	Healthcare Financial Management Association
Lee Schwamm, MD, Director of the Center for TeleHealth; Vice President, Virtual Care Juan Estrada, MBA, Senior Director, Center for TeleHealth and Department of Neurology	Massachusetts General Hospital, a part of Mass General Brigham
Joe Kvedar, MD, Chair of the Board	American Telemedicine Association
Thomas Yackel, MD, President Robert Findling, MD, MBA, Chair, Department of Psychiatry	VCU Health
Halee Fischer-Wright, MD, President and Chief Executive Officer	Medical Group Management Association
Richard Milani, MD, Chief Clinical Transformation Officer and Vice Chairman of Cardiology	Ochsner Health
Russell Libby, MD, Founder and President and Board Member at the Physicians Foundation	Virginia Pediatric Group
Marcus Osborne, MBA, Senior Vice President, Walmart Health	Walmart

In addition to the individuals noted above, we spoke with other health care industry stakeholders including a large national telehealth company, a former executive from a national integrated delivery system, and an executive from one of the largest federally qualified health center networks in the country.

Appendix 2. State of the Evidence on Virtual Care

The body of literature measuring the value of virtual care has grown substantially in the past few decades. A key insight from the available literature is that the value of virtual care can take different forms for different stakeholders and resists generalization.

Recent studies and systematic reviews suggest that virtual care can improve health outcomes, particularly for older adults with chronic diseases and behavioral health conditions.[39,40,41,42] For example, a 2016 AHRQ study identified a large volume of research that supported the conclusion that video visits and remote monitoring of chronic conditions such as cardiovascular and respiratory disease consistently produced improvements in outcomes such as mortality, quality of life and reductions in hospital admissions.[43] The use of virtual care was also associated with reduced acute care utilization (e.g., readmissions, length of stay, ED visits).[44,45,46,47,48,49,50,51,52] The NCQA Taskforce on Telehealth Policy, which released its report in late 2020, cited evidence from several large health systems and payers that the use of virtual care, both before and during the pandemic, reduced urgent and ED care as well as use of expensive or often overused services such as imaging.[53] There was relatively less evidence in the literature on telehealth's impact on health outcomes related to maternal health, teledentistry and optometry, among other services that may be delivered via virtual care methods. More research is needed to assess the full range of clinical use cases for which each modality may be used to deliver care virtually.

Studies included in the literature scan also suggest that using synchronous video visits in a clinically appropriate manner does not impact the ability of the clinician or care team to obtain clinical information, make an accurate diagnosis, and develop a treatment plan that produces the same desired clinical outcomes as compared with in-person care.[54]

Across studies measuring the value of virtual care in different settings, there is a large body of evidence focused on integrated health systems and academic health systems.[55,56,57,58,59,60,61,62,63,64] There was relatively less focus on small-group, large-group, federally qualified health center and other practice settings. Though the scan assessed a variety of practice types, it was often not clear from the studies what primary payment arrangement was supporting a given clinician organization's virtual care program. Among those that were identifiable, nearly all were involved in FFS payment arrangements (typically Medicare FFS). More research is needed to assess the impact of virtual care within alternative payment arrangements such as one-sided or two-sided risk-based arrangements.

Many studies reviewed in the literature scan indicated that the delivery of virtual care could result in significant time and cost savings for patients in the form of reduced travel costs and time spent traveling to appointments.[65,66,67,68] The literature also suggests that access to virtual care reduces wait times to next appointment and increases rates of referral completion to specialty services, particularly for rural patients who face barriers to accessing care.[69,70,71] However, though virtual care has the potential to increase access, the literature describes that patients face three overlapping barriers to accessing virtual care: the absence of technology, digital literacy and reliable internet coverage. Together, these barriers comprise the digital divide, which disproportionately affects older people of color and those with low socioeconomic status.[72,73]

Relatively few studies assess the impact of digitally enabled care models on health equity, but the COVID-19 pandemic has spurred new studies incorporating this critical outcome as part of evaluation.[74]

The literature also suggests that virtual care programs have been shown to reduce patient no-show rates for appointments. These studies note that reductions in no-show rates resulted in increased

care plan adherence and improved chronic disease management. In addition, digitally enabled care models may potentially promote the delivery of care in the most appropriate setting.[75,76]

Lastly, the literature scan found that most patients and clinicians reported high levels of satisfaction with virtual care modalities.[77,78,79,80,81,82] Often, health care organizations developed their own satisfaction surveys since current, widely used surveys, such as the Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey, do not typically include virtual care modality–specific questions.[83,84,85]

Appendix 3. Glossary of Terms

Accountable Care Organization: Groups of doctors, hospitals and other health care providers, who come together voluntarily to give coordinated high-quality care to a population of patients they serve.

Acute Ischemic Stroke: A stroke that occurs as a result of obstructed blood flow in a blood vessel to the brain.

Agency for Healthcare Research and Quality (AHRQ): A federal agency charged with improving the safety and quality of America's health care system. More information on AHRQ can be found here.

Alternative Payment Model (APM): A value-based payment approach that gives added incentive payments to provide high-quality and cost-efficient care. APMs can apply to a specific clinical condition, a care episode or a patient population.

Asynchronous: Services that represent store-and-forward transmissions of health information over periods of time using a secure web server, encrypted email, specially designed store-and-forward software or EHR. Asynchronous services enable a patient to share health information for later review by the physician or other qualified health care professional. These services also allow a physician or other qualified health care professional to share a patient's medical history, images, physiologic/non-physiologic clinical data and/or pathology, and laboratory reports with a specialist physician for diagnostic and treatment expertise.

Augmented Intelligence (AI): The AMA's House of Delegates uses the term augmented intelligence (AI) as a conceptualization of artificial intelligence that focuses on AI's assistive role, emphasizing that its design enhances human intelligence rather than replaces it. More information can be found here.

Broadband: High-speed internet access that is always on and faster than the traditional dial-up access.

Bundled Payment: A reimbursement model in which health care providers are paid based on the expected costs for a clinically defined episode of care or a bundle of related health care services.

Capitation: A reimbursement model in which a fixed amount of money per patient per unit of time is paid in advance to the physician for the delivery of health care services.

Care Management: Team-based, patient-centered approach designed to assist patients and their support systems in managing medical conditions more effectively. It also encompasses care coordination activities needed to help manage chronic illness.

Centers for Medicare & Medicaid Services (CMS): A federal agency within the U.S. Department of Health & Human Services that administers the Medicare program and works in partnership with states to administer the Medicaid and Children's Health Insurance programs. More information on CMS can be found here.

Chronic Disease: An illness or medical condition lasting more than three months, generally not self-limited, with an impact on patient quality of life and function "broadly inclusive of health issues that require a life course approach to health promotion, risk factor reduction, disease prevention, treatment and management of illness, and systems-level, multi-sectoral approaches for population health."

Chronic Disease Management: An integrated care approach to managing chronic disease.

Consumer Assessment of Healthcare Providers and Systems Survey (CAHPS): A program within the Agency for Healthcare Research and Quality that began in 1995 with the purpose of advancing scientific understanding of patient experience with health care. More information on CAHPS can be found here.

Contribution Margin: The amount of incremental revenue after subtracting variable costs.

Digital Divide: Economic and social inequality with regard to access to, use of, or impact of information and communication technologies.

Digitally Enabled Care: Fully integrated in-person and virtual care models that hybridize care delivery based on clinical appropriateness and other factors such as convenience and cost.

Digital Literacy: Ability to seek, find, understand and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem.

Digital Medicine: The use of technologies for measurement and intervention in the service of patient health.

Door-to-Needle Time: The time from presentation of patient with symptoms at the hospital to the start of intravenous thrombolysis.

Downside Risk: Assuming risk for actual costs of care. If the cost of care falls below the targeted costs, the practice will share in savings. If the cost of care exceeds the targeted or budgeted costs, the practice will be responsible for a portion of the difference between actual total costs and targeted or budgeted costs.

Electronic Health Record (EHR): Digital version of a patient's paper chart. EHRs are real-time, patient-centered records that make information available instantly and securely to authorized users.

Environmental Variables: Contextual factors that impact the value that can be generated by digitally enabled care models.

E-Visit: Modality of virtual care in which a clinician connects with the patient via patient portal, secure email or telehealth platform to provide clinical advice or support.

Fee-for-Service: A reimbursement model in which doctors and other health care providers are paid for each service performed.

Health Care Disparity: Racial, ethnic, and social differences in quality of health care that "are not due to access-related factors or clinical needs, preferences, and appropriateness of intervention," as defined by the Institute of Medicine.

Health Equity: A fair and just opportunity for all individuals to attain optimal health regardless of race, ethnicity, disability, gender identity, sexual orientation or socioeconomic status. More information can be found here.

Health Inequity: Differences in health outcomes that are systematic, avoidable, unnecessary, unfair, and unjust.

Healthcare Effectiveness Data and Information Set (HEDIS): Widely used set of performance measures in the managed care industry, developed and maintained by the NCQA. More information on HEDIS can be found here.

Hemoglobin A1C (HbA1c): A minor component of hemoglobin to which glucose is bound. HbA1c levels depend on the blood glucose concentration: The higher the glucose concentration in blood, the higher the level of HbA1c. Measurement of HbA1c is a useful indicator of how well the blood glucose level has been controlled in the recent past and may be used to monitor the effects of diet, exercise and drug therapy on blood glucose in patients with diabetes.

Hub Hospital: Typically a comprehensive tertiary care center where vascular neurologists and other acute stroke specialists compose a call panel delivering telestroke services to network affiliate/partner sites (spoke hospitals).

Interprofessional Consult: An assessment and management service in which a patient's treating (e.g., attending or primary) physician/other qualified health care professional (QHP) requests the opinion and/or treatment advice of a consultant with specific specialty expertise to assist the treating physician/QHP in the diagnosis and/or management of the patient's problem without the need for the patient's face-to-face contact with the consultant.

Interstate Medical Licensure Compact (IMLC): An agreement among participating U.S. states to work together to significantly streamline the licensing process for physicians who want to practice in multiple states. It offers a voluntary, expedited pathway to licensure for physicians who qualify. More information on the IMLC can be found here.

Length of Stay: Duration of a single episode of hospitalization. Inpatient days are calculated by subtracting day of admission from day of discharge.

Marginalized Communities: Groups of people who have faced historical oppression and exclusion from social, economic, political, educational, and/or cultural systems and opportunities. Marginalization occurs due to unequal power dynamics brokered and upheld by existing systems of power.

Medicare Shared Savings Program (MSSP): A federal program that offers Medicare providers and suppliers (e.g., physicians, hospitals and others involved in patient care) an opportunity to create an accountable care organization. More information on MSSP can be found here.

Medication Management: A strategy for engaging with patients and caregivers to create a complete and accurate medication list.

Medication Reconciliation: The process of creating the most accurate list possible of all medications a patient is taking—including drug name, dosage, frequency and route—and comparing that list against the physician's admission, transfer and/or discharge orders, with the goal of providing correct medications to the patient at all transition points within the hospital.

Merit-based Incentive Payment System (MIPS) Program: A component of the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA), which established the Medicare Quality Payment Program to reward high-value, low-cost care. Under MIPS, eligible clinicians continue to be paid on an FFS basis and report cost and quality data. Following each performance year, clinicians are evaluated on their performance

relative to other clinicians in the country and receive a positive, neutral or negative payment adjustment to their Medicare Part B payments two years later. More information on MIPS can be found here.

National Committee for Quality Assurance (NCQA): An independent, nonprofit organization in the United States that works to improve health care quality through the administration of evidence-based standards, measures, programs and accreditation. More information on NCQA can be found here.

National Quality Forum (NQF): A not-for-profit, nonpartisan, membership-based organization that promotes patient protections and health care quality through measurement and public reporting. More information on NQF can be found here.

Net Promoter Score (NPS): Percentage of customers rating their likelihood to recommend a company, a product or a service to a friend or colleague.

Next Generation Accountable Care Organization Model (Next Gen ACO Model): An initiative for Medicare accountable care organizations that are experienced in coordinating care for populations of patients. The program allows these provider groups to assume higher levels of financial risk and reward than are available under the Medicare Shared Savings Program (MSSP). More information on the Next Gen ACO Model can be found here.

No-Show Rate: Percentage of appointments for which patients did not show.

Panel Size: The number of individual patients under the care of a specific clinician.

Patient Activation Measure (PAM): A 100-point, quantifiable scale determining patient engagement in health care.

Patient Retention Rate: Percentage of patients that a health care organization continues to provide services to over a given period of time.

Pay-for-Performance: A reimbursement model that rewards doctors, hospitals and other health care providers for attaining targeted service goals such as meeting health care quality or efficiency standards.

Population-Based Payment: A reimbursement model that rewards health care providers for meeting population-level targets. In a population-based payment arrangement, a provider entity agrees to accept responsibility for the health of a group of patients in exchange for a set amount of money. If the provider effectively manages cost and performs well on quality-of-care targets, the provider may keep a portion of the savings generated.

Propensity-Matched Group: A quasi-experimental method in which the researcher uses statistical techniques to construct an artificial control group by matching each treated unit with a non-treated unit of similar characteristics.

Remote Patient Monitoring: The monitoring and collection of patient data outside of the office, mostly asynchronously, which results in clinical decision-making and care management follow-up that may be provided in person or virtually.

Risk-Based Arrangement/Contracting: Contracts that are based on risk and come in a variety of shapes and sizes. The highest form is full capitation, in which hospitals or physician groups receive a monthly payment to provide all care for a patient.

Shared Savings: A payment strategy that offers incentives for providers to reduce health care spending for a defined patient population by offering them a percentage of net savings realized as a result of their efforts.

Short Message Service (SMS) Messaging: A text messaging service component of most telephone, internet and mobile device systems.

Social Determinants of Health (SDOH): Conditions in the places where people live, learn, work and play that affect a wide range of health risks and outcomes. These include conditions impacted by the distribution of wealth and resources.

Spoke Hospital: A hospital that receives telestroke support from a Hub Hospital.

Synchronous: Services that represent real-time interactions between a distant-site physician or other QHP and a patient and/or family located at a remote, originating site.

Telehealth: The exchange of medical information from one site to another through electronic communication. CMS defines telehealth as a two-way, real-time interactive communication between a patient and a physician or practitioner at a distant site through telecommunications equipment that includes, at a minimum, audio and visual equipment.

Throughput Rate: Number of patients seen by the health care provider per week.

Time to Third Next Available Appointment or Consultation: Average length of time in days between the day a patient makes a request for an appointment with a physician and the third available appointment for a new patient physical, routine exam or return visit exam.

Tissue Plasminogen Activator (tPA): A drug used to break up a blood clot and restore blood flow to the brain.

Upside Risk: Value-based payment models where the provider only shares in savings and not the risk of loss.

Value-Based Payment Models/Arrangements: A health care delivery model in which providers, including hospitals and physicians, are paid based on patient health outcomes. Value-based payment models reward health care providers with incentive payments for quality of care.

Value Stream: Categories that specify how digitally enabled care models can generate value.

Video Visit: A mode of virtual care delivery in which a clinician connects directly with the patient via videoconferencing technology to conduct the office visit.

Virtual Care: Health care delivered at a distance—synonymous with "telehealth."

Virtual Secure Messaging: An encrypted, web-based mode of communication between provider and patient.

Whole-Person Care: The coordination of health, behavioral health and social services in a patient-centered manner with the goals of improved health outcomes and more efficient and effective use of resources.

[1] Mehrotra, Ateev, et al. The Impact of the COVID-19 Pandemic on Outpatient Care: Visits Return to Prepandemic Levels, but Not for All Providers and Patients. Commonwealth Fund. October 2020. Available at: https://doi.org/10.26099/41xy-9m57.

[2] Manatt Health. Executive Summary – Tracking Telehealth COVID-19 Policy Changes. Manatt Health. Available at: https://www.manatt.com/insights/newsletters/covid-19-update/executive-summary-tracking-telehealth-changes-stat.

[3] Kidholm, Kristian, et al. "The Model for Assessment of Telemedicine (MAST): A scoping review of empirical studies." Journal of Telemedicine and Telecare 23.9 (2017): 803–813.

[4] Field, Marilyn J. Telemedicine: A Guide to Assessing Telecommunications for Health Care. Institute of Medicine. Washington, DC: The National Academies Press. 1996. https://doi.org/10.17226/5296.

[5] Edmunds, Margo, et al. "An emergent research and policy framework for telehealth." eGEMs 5.2 (2017).

[6] Cusack, Caitlin M., et al. "The value proposition in the widespread use of telehealth." Journal of Telemedicine and Telecare 14.4 (2008): 167–168.

[7] Bodenheimer, Thomas, and Christine Sinsky. "From triple to quadruple aim: care of the patient requires care of the provider." The Annals of Family Medicine 12.6 (2014): 573–576.

[8] Mehrotra, Ateev, et al. The Impact of the COVID-19 Pandemic on Outpatient Care: Visits Return to Prepandemic Levels, but Not for All Providers and Patients. Commonwealth Fund. October 2020. Available at: https://doi.org/10.26099/41xy-9m57.

[9] Board on Health Care Services; Institute of Medicine. The Role of Telehealth in an Evolving Health Care Environment: Workshop Summary. Washington (DC): National Academies Press (US); 2012 Nov 20. 3. Available at: https://www.ncbi.nlm.nih.gov/books/NBK207145/ doi: 10.17226/13466.

[10] https://www.brookings.edu/wp-content/uploads/2020/05/Removing-barriers-to-telehealth-before-and-after-COVID-19_PDF.pdf.

[11] CMS Newsroom. Trump Administration Finalizes Permanent Expansion of Medicare Telehealth Services and Improved Payment for Time Doctors Spend with Patients. December 1, 2020. Available at: https://www.cms.gov/newsroom/press-releases/trump-administration-finalizes-permanent-expansion-medicare-telehealth-services-and-improved-payment.

[12] CMS. Medicaid and CHIP COVID-19 Summaries, Preliminary Medicaid and CHIP Data Snapshot. January 2021. Available at: https://www.medicaid.gov/sites/default/files/2021-01/covid19-data-snapshot.pdf.

[13] Julie Hudman, et al. How Private Insurers Are Using Telehealth to Respond to the Pandemic. Peterson Center on Healthcare and the Kaiser Family Foundation. August 6, 2020. Available at: https://www.healthsystemtracker.org/brief/how-private-insurers-are-using-telehealth-to-respond-to-the-pandemic/.

[14] The COVID-19 Healthcare Coalition Telehealth Impact Study Work Group. COVID-19 Telehealth Impact Study. COVID-19 Healthcare Coalition. January 2021. Available at: https://c19hcc.org/telehealth/impact-home/.

[15] Rock Health. Digital Health Consumer Adoption Report 2020. Available at: https://rockhealth.com/reports/digital-health-consumer-adoption-report-2020/.

[16] National Association of Quality Assurance. COVID-Driven Telehealth Surge Triggers Changes to Quality Measures. June 2020. Available at: https://www.ncqa.org/programs/data-and-information-technology/telehealth/covid-driven-telehealth-surge-triggers-changes-to-quality-measures/.

[17] https://www.ahrq.gov/sites/default/files/wysiwyg/research/findings/nhqrdr/2018qdr-intro-methods.pdf.

[18] Tai-Seale, Ming, et al. "Technology-enabled consumer engagement: promising practices at four health care delivery organizations." Health Affairs 38.3 (2019): 383–390.

[19] *Ibid*.

[20] *Ibid*.

[21] *Ibid*.

[22] *Ibid*.

[23] *Ibid*.

[24] Milani, Richard V., et al. "Improving hypertension control and patient engagement using digital tools." *The American Journal of Medicine* 130.1 (2017): 14–20.

[25] Ochsner Health. Digital Medicine. Available at: https://www.ochsner.org/io/work/digital-medicine.

[26] *Ibid.*

[27] Tai-Seale, Ming, et al. "Technology-enabled consumer engagement: promising practices at four health care delivery organizations." Health Affairs 38.3 (2019): 383–390.

[28] Massachusetts General Hospital, Teleneurology Overview. Available at: https://www.massgeneral.org/neurology/teleneurology.

[29] American Heart Association. Target: Stroke – When Seconds Count. Available at: https://www.heart.org/en/professional/quality-improvement/target-stroke/learn-more-about-target-stroke.

[30] Moreno, Arianna, et al. "Frequent Hub–Spoke Contact Is Associated with Improved Spoke Hospital Performance: Results from the Massachusetts General Hospital Telestroke Network." Telemedicine and e-Health 24.9, 2018: 678–683.

[31] Cityblock Health. "The Crisis Within a Crisis: Putting Our Members First." April 16, 2019. Available at: https://medium.com/cityblock-health/the-crisis-within-the-crisis-putting-our-members-first-2f48ba16a91f.

[32] Health Care Payment Learning and Action Network. Alternative Payment Models. Available at: http://hcp-lan.org/workproducts/apm-framework-onepager.pdf.

[33] CMS Innovation Center. "What is the Telehealth Waiver?" Available at: https://innovation.cms.gov/files/x/nextgenaco-whatistelehealthwaiver.pdf.

[34] Agency for Healthcare Research and Quality. Telehealth. Available at: https://www.ahrq.gov/topics/telehealth.html.

[35] Center for Connected Health Policy. Cross State Licensing. Available at: https://www.cchpca.org/telehealth-policy/cross-state-licensing.

[36] Federation of State Medical Boards. U.S. States and Territories Modifying Requirements for Telehealth in Response to COVID-19. March 31, 2021. Available at: https://www.fsmb.org/siteassets/advocacy/pdf/states-waiving-licensure-requirements-for-telehealth-in-response-to-covid-19.pdf.

[37] Interstate Medical Licensure Compact. Available at: https://www.imlcc.org/.

[38] Crear-Perry, Joia, et al. "Moving towards anti-racist praxis in medicine." The Lancet 396.10249 (2020): 451–453.

[39] Totten, Annette Marie, et al. "Telehealth: mapping the evidence for patient outcomes from systematic reviews." (2016).

[40] Bashshur, Rashid L., et al. "The empirical foundations of telemedicine interventions for chronic disease management." Telemedicine and e-Health 20.9 (2014): 769–800.

[41] National Association of Quality Assurance. Taskforce on Telehealth Policy (TTP) Findings and Recommendations. September 2020. Available at: https://www.ncqa.org/programs/data-and-information-technology/telehealth/taskforce-on-telehealth-policy/taskforce-on-telehealth-policy-findings-and-recommendations/.

[42] Totten, Annette Marie, et al. "Telehealth for acute and chronic care consultations." (2019).

[43] Totten, Annette Marie, et al. "Telehealth: mapping the evidence for patient outcomes from systematic reviews." (2016).

[44] National Association of Quality Assurance. Taskforce on Telehealth Policy (TTP) Findings and Recommendations. September 2020. Available at: https://www.ncqa.org/programs/data-and-information-technology/telehealth/taskforce-on-telehealth-policy/taskforce-on-telehealth-policy-findings-and-recommendations/.

[45] Bashshur, Rashid L., et al. "The empirical foundations of telemedicine interventions for chronic disease management." Telemedicine and e-Health 20.9 (2014): 769–800.

[46] Kruse, Clemens S., et al. "The effectiveness of telemedicine in the management of chronic heart disease–a systematic review." JRSM open 8.3 (2017): 2054270416681747.

[47] Lilly, Craig M., et al. "ICU telemedicine program financial outcomes." Chest 151.2 (2017): 286–297.

[48] O'Connor, Melissa, et al. "Using telehealth to reduce all-cause 30-day hospital readmissions among heart failure patients receiving skilled home health services." Applied clinical informatics 7.2 (2016): 238.

[49] Maeng, Daniel D., et al. "Can telemonitoring reduce hospitalization and cost of care? A health plan's experience in managing patients with heart failure." Population health management 17.6 (2014): 340–344.

[50] Center for Technology and Aging. Measuring Return on Investment of Remote Patient Monitoring: Developing the Model. 2014. Available at: http://www.techandaging.org/ROIModelReport.pdf.

[51] Association of American Medical Colleges. Project CORE: Coordinating Optimal Referral Experiences. Available at: https://www.aamc.org/what-we-do/mission-areas/patient-care/project-core.

[52] Mehrotra, Ateev, et al. "A comparison of care at e-visits and physician office visits for sinusitis and urinary tract infection." JAMA internal medicine 173.1 (2013): 72–74.

[53] National Association of Quality Assurance. Taskforce on Telehealth Policy (TTP) Findings and Recommendations. September 2020. Available at: https://www.ncqa.org/programs/data-and-information-technology/telehealth/taskforce-on-telehealth-policy/taskforce-on-telehealth-policy-findings-and-recommendations/.

[54] Agency for Healthcare Research and Quality. Telediagnosis for Acute Care: Implications for the Quality and Safety of Diagnosis. August 2020. Available at: https://www.ahrq.gov/patient-safety/reports/issue-briefs/teledx.html.

[55] Spaulding, Ryan, et al. "Cost savings of telemedicine utilization for child psychiatry in a rural Kansas community." Telemedicine and e-Health 16.8 (2010): 867–871.

[56] Nelson, Caroline A., et al. "Impact of store-and-forward (SAF) teledermatology on outpatient dermatologic care: A prospective study in an underserved urban primary care setting." Journal of the American Academy of Dermatology 74.3 (2016): 484–490.

[57] Dullet, Navjit W., et al. "Impact of a university-based outpatient telemedicine program on time savings, travel costs, and environmental pollutants." Value in Health 20.4 (2017): 542–546.

[58] Southard EP, Neufeld JD, Laws S. Telemental health evaluations enhance access and efficiency in a critical access hospital emergency department. *Telemed J E Health*. 2014;20(7):664–668.

[59] Price M, Gros DF. Examination of prior experience with telehealth and comfort with telehealth technology as a moderator of treatment response for PTSD and depression in veterans. *Int J Psychiatry Med*. 2014;48(1):57–67. doi: 10.2190/PM.48.1.e. PMID: 25354926.

[60] Ohl M, Dillon D, Moeckli J, et al. Mixed-methods evaluation of a telehealth collaborative care program for persons with HIV infection in a rural setting. *J Gen Intern Med*. 2013;28(9):1165–1173.

[61] Jia H, Chuang HC, Wu SS, et al. Long-term effect of home telehealth services on preventable hospitalization use. *J Rehabil Res Dev*. 2009;46(5):557–566.

[62] Levy CE, Silverman E, Jia H, et al. Effects of physical therapy delivery via home video telerehabilitation on functional and health-related quality of life outcomes. *J Rehabil Res Dev*. 2015;52(3):361–370.

[63] Russo, Jack, McCool, Ryan, Davies, Louise. (2015). VA Telemedicine: An Analysis of Cost and Time Savings. Telemedicine and e-Health. 22. 150826130302005. 10.1089/tmj.2015.0055.

[64] Darkins A, Ryan P, Kobb R, et al. Care coordination/home telehealth: the systematic implementation of health informatics, home telehealth, and disease management to support the care of veteran patients with chronic conditions. *Telemed J E Health*. 2008;14(10):1118–1126.

[65] Medicare and Medicaid Programs; Policy and Technical Changes to the Medicare Advantage, Medicare Prescription Drug Benefit, Program of All-Inclusive Care for the Elderly (PACE), Medicaid Fee-for-Service, and Medicaid Managed Care Programs for Years 2020 and 2021, Centers for Medicare & Medicaid Services, November 2018.

[66] Russo, Jack, McCool, Ryan, Davies, Louise. (2015). VA Telemedicine: An Analysis of Cost and Time Savings. Telemedicine and e-Health. 22. 150826130302005. 10.1089/tmj.2015.0055.

[67] Dullet, Navjit W., et al. "Impact of a university-based outpatient telemedicine program on time savings, travel costs, and environmental pollutants." Value in Health 20.4 (2017): 542–546.

[68] Association of American Medical Colleges. Project CORE: Coordinating Optimal Referral Experiences. Available at: https://www.aamc.org/what-we-do/mission-areas/patient-care/project-core.

[69] Southard, Erik P., Jonathan D. Neufeld, and Stephanie Laws. "Telemental health evaluations enhance access and efficiency in a critical access hospital emergency department." Telemedicine and e-Health 20.7 (2014): 664–668.

[70] Nelson, Caroline A., et al. "Impact of store-and-forward (SAF) teledermatology on outpatient dermatologic care: A prospective study in an underserved urban primary care setting." Journal of the American Academy of Dermatology 74.3 (2016): 484–490.

[71] Association of American Medical Colleges. Project CORE: Coordinating Optimal Referral Experiences. Available at: https://www.aamc.org/what-we-do/mission-areas/patient-care/project-core.

[72] Velasquez, David, and Ateev Mehrotra. "Ensuring the growth of telehealth during COVID-19 does not exacerbate disparities in care." Health Affairs Blog (2020).

[73] Nouri, Sarah, et al. "Addressing equity in telemedicine for chronic disease management during the Covid-19 pandemic." NEJM Catalyst Innovations in Care Delivery 1.3 (2020).

[74] Yuan, Neal, et al. "Patient Use and Clinical Practice Patterns of Remote Cardiology Clinic Visits in the Era of COVID-19." JAMA Network Open 4.4 (2021): e214157–e214157.

[75] National Association of Quality Assurance. Taskforce on Telehealth Policy (TTP) Findings and Recommendations. September 2020. Available at: https://www.ncqa.org/programs/data-and-information-technology/telehealth/taskforce-on-telehealth-policy/taskforce-on-telehealth-policy-findings-and-recommendations/.

[76] Association of American Medical Colleges. Project CORE: Coordinating Optimal Referral Experiences. Available at: https://www.aamc.org/what-we-do/mission-areas/patient-care/project-core.

[77] "The Rapid Transition to Telemedicine: Insights and Early Trends." (2020). Press Ganey. Available at: https://www.pressganey.com/autoresponder/2020-telemedicine.

[78] Leventhal R. Telehealth program proves positive for Bon Secours patients. Healthcare Informatics. August 19, 2015. https://www.hcinnovationgroup.com/clinical-it/news/13025594/telehealth-program-proves-positive-for-bon-secours-patients.

[79] Levy, Charles E., Meghan Geiss, and M. H. A. David Omura DPT. "Effects of physical therapy delivery via home video telerehabilitation on functional and health-related quality of life outcomes." Journal of Rehabilitation Research and Development 52.3 (2015): 361.

[80] Association of American Medical Colleges. Project CORE: Coordinating Optimal Referral Experiences. Available at: https://www.aamc.org/what-we-do/mission-areas/patient-care/project-core.

[81] Bhandari, Naleen Raj, et al. "Validation of newly developed surveys to evaluate patients' and providers' satisfaction with telehealth obstetric services." Telemedicine and e-Health 26.7 (2020): 879–888.

[82] Dobrusin, Avi, et al. "Gastroenterologists and patients report high satisfaction rates with telehealth services during the novel coronavirus 2019 pandemic." Clinical Gastroenterology and Hepatology 18.11 (2020): 2393–2397.

[83] Levy, Charles E., Meghan Geiss, and M. H. A. David Omura DPT. "Effects of physical therapy delivery via home video telerehabilitation on functional and health-related quality of life outcomes." Journal of Rehabilitation Research and Development 52.3 (2015): 361.

[84] Chen, Shengnan, Alice Cheng, and Khanjan Mehta. "A review of telemedicine business models." Telemedicine and e-Health 19.4 (2013): 287–297.

[85] Leventhal R. Telehealth program proves positive for Bon Secours patients. Healthcare Informatics. August 19, 2015. https://www.hcinnovationgroup.com/clinical-it/news/13025594/telehealth-program-proves-positive-for-bon-secours-patients.