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Transforming care delivery through virtual health

Help increase access, improve value, and establish competitive advantage by operationalizing technology solutions

Virtual health at a glance: The current landscape

Virtual health encompasses several modalities (asynchronous, synchronous, and hybrid) of digital and telecommunication technologies that may be used to deliver health care. It can act as a complement, or even a complete substitute, for care based on the needs of the patient population, capabilities of the organization, and availability of resources. The overall goal is to improve access to critical services and reduce cost constraints across the continuum of care.[1]
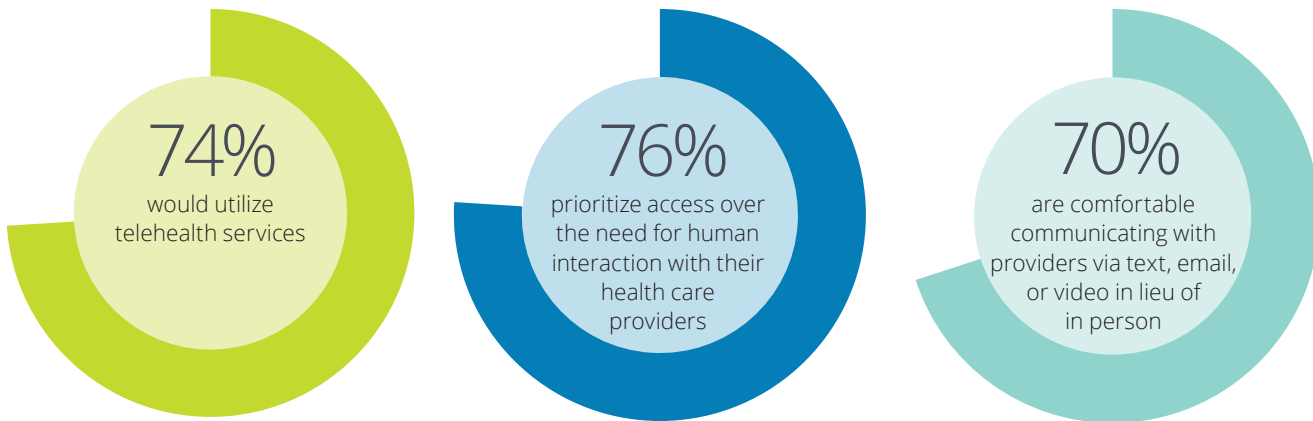
Table 1. Virtual health at-a-glance

	Size	Approach	Model
Description	Does not require real-time interaction between patients and providers. These initiatives leverage store-and-forward technology to exchange pre-recorded data.	Requires real-time interaction between patients and providers using audio-visual communications and/or remote monitoring technology.	Combines asynchronous and synchronous technologies to provide health and wellness support for patients.
Examples	Tele-radiology, tele-dermatology, and secured messaging	Virtual consults, virtual visits, and Remote ICUs	Transitional care (post-discharge), and home/mobile health monitoring with helpline

The health care landscape is primed for the expanded adoption of this new care model. Several key factors elevate the interest in implementing virtual health technologies, including expected physician shortages, continued growth in advanced technologies, increased patient demand, and the changing policy landscape.

Physician shortages—The Association of American Medical Colleges estimates a physician shortage of 90,000 doctors in the next five years.[2] This is due to a combination of factors, including a large portion of practicing physicians retiring as well as an increase in the insured population due to regulatory policy changes. Organizations will need to find creative ways to handle the new supply and demand constraints while also ensuring access to care.

Advanced technologies—The industry continues to embrace technology. The widespread adoption of Electronic Health Records (EHRs) is a foundational building block for new digital tools to enhance the delivery of care. Not only can physicians store and share medical information, but new wearable technologies allow them to remotely monitor and evaluate patient's treatment compliance and progress. In fact, the wearable device market was valued at $13.2B in 2016, encompassing four main segments: lifestyle and fitness, diagnostics and monitoring, therapeutic care, and injury prevention and rehabilitation.[3] Furthermore, with almost 90% of US adults using the internet, doctors now have the capability and flexibility to communicate via web to answer non-urgent related medical concerns.[4]

Patient demand—In the last few years, virtual health has become increasingly popular among patients. Current statistics show increasing changes in consumer preferences and behavior:[5]

74%
would utilize
telehealth services

76%
prioritize access over
the need for human
interaction with their
health care
providers

70%
are comfortable
communicating with
providers via text, email,
or video in lieu of
in person

Policy landscape—The policy landscape is evolving to meet this new consumer demand. Specifically, new measures have been proposed, which provide hope that overall regulatory adoption and reimbursement is on the horizon.

- Medicaid Home Care. In February 2016, the US Centers for Medicare and Medicaid Services (CMS) updated their policies to approve face-to-face video interactions as sufficient for meeting the provider requirement to see a patient prior to ordering home health services.[6]

- Medicaid Managed Care. In April 2016, CMS released updated regulations to modernize Medicaid managed care.[7] As part of that rule, CMS added that states should consider telemedicine, e-visits, and other evolving innovative solutions"[8] to achieve these new standards.

- MACRA. In May 2016, CMS published a proposal for the Medicare Access and CHIP Reauthorization Act (MACRA).[9] The new rule consolidates components of three existing programs to create a system that better aligns financial incentives with clinical performance and outcomes. CMS will look at quality, resource use, health information technology (HIT) use, and clinical practice improvement.

- Medicare. Currently, Medicare will only reimburse for a face-to-face interactive video consultation if a) the patient is in a health professional shortage area

or in a county outside a metropolitan statistical area (MSA) and b) the telehealth site is in a medical facility. However, there is proposed legislation, such as the Medicare Telehealth Parity Act of 2015 and Creating Opportunities Now for Necessary and Effective Care Technologies (CONNECT) for Health Act, which aims to remove the geographic barrier and expand the list of covered services and the Medicare Physician Fee Schedule 2018, which proposes paying for new care services delivered via telehealth.[10] There are also experimental CMS programs (see Table 2 in the appendix) that are geared toward measuring the value of telehealth and whether Medicare should provide coverage. As Medicare usually sets the standard for other groups, stakeholders are watching these efforts closely.[11]

- Physician Licensures. The Interstate Medical Licensure Compact has been adopted by 18 states as of April 2017.[12] This resolution expedites the licensure process for physicians looking to practice in multiple states. Being able to practice across state lines is vital for physicians providing virtual services, so this support and implementation is a step in the right direction.[13]

While change has been slow, there has been steady progress at both the national and state levels to expand utilization of virtual health technologies to deliver care. As organizations begin to plan and design their approach for virtual health, close attention and anticipation of these new regulatory changes is critical.

Our take: Market potential

The virtual health space has potential to transform care delivery. A 2016 report estimated that the US virtual health market will reach $3.5B in revenues by 2022.[14] While outcomes from early adopters have been mixed, there is a clear trend demonstrating the effectiveness of clinical solutions such as telehealth and remote monitoring. Our experience has shown that developing the appropriate infrastructure and operating model along with the technology is a key differentiator.

Table 2. Examples of organizations demonstrating the effectiveness of virtual health

Health System	Size	Approach	Model	Description	Outcomes
Large non-profit health system in the Northeast[15, 16, 17]	14 hospitals, 5 community health centers, 8 health care programs	Physiological health monitoring from patient's home	Internally built with external vendors	The program enrolled 348 heart failure patients to self-monitor their physiological health post-discharge for a four month period. Patients then uploaded their information for physician review.	• Reduction in health failure-related readmission rates • Reduced mortality rates • Estimated $10M in utilization • Improved patient satisfaction
Large faith-based health system in the Midwest[18]	46 hospitals, 700+ physician practices and outpatient facilities	Remote eICU monitoring	External vendor	Supports hospital-based critical case units with early warning software and remote monitoring tools. The VISICU eICU technology enables off-site critical care physicians and nurses to support bedside staff in delivering high-quality care via voice, video, and physiologic data monitoring.	• 15-20% reduction in ICU mortality rates • 10-15% reduction in ICU length of stay • Reduced code blues • Reduced nurse turnover • Improved patient satisfaction
Mid-size for-profit hospital in the Pacific[19]	371-bed hospital, part of a health system with 34 hospitals	Remote eICU monitoring	External vendor	eICU allows staff based in an urban area to help treat patients at three other remote locations. Clinical staff in the eICU monitor the patients' breathing rate, blood pressure, and oxygen level as well as see patients through cameras in the room.	• eICU prevented about 17 patients from being transported to their hospital (~$20,000 per medevac transport)
Mid-size non-profit health system in the Midwest[20, 21]	7 hospitals, 38 medical centers	Telehealth medication dispensers	External vendor	Managed over 230 senior patients at risk for medication mismanagement using telehealth medication dispensers, which automatically dispense a dose according to a schedule and provides audible and visual reminders. If a dose is missed, system notifies a designated caregiver and places the missed dose in a locked compartment.	• 98% compliance rate (seniors using a pillbox typically miss 30% of doses per month) • Reduced physician visits and hospitalizations
Mid-size faith-based hospital in the Northeast[22, 23, 24]	473-bed hospital, part of large faith-based health system with 131 hospitals	Multidisciplinary Video collaboration; Bluetooth electronic stethoscopes	External vendors	The health system utilized Polycom video to connect understaffed rural hospitals with remote specialists for cardiology and oncology services. The program also included the use of Bluetooth-capable electronic stethoscopes that enable clinicians to remotely listen to lung and heart sounds. The program has expanded its reach to bariatric patients suffering from obesity.	• Reduced readmissions • 100% ROI within two months • Increased high quality care access for rural patients

Increasing competition

With such high market potential for the broader virtual health delivery model, industry leaders are moving to establish footholds in the provider landscape. First, third-party, on-demand physician networks have been created, sponsored by established insurance groups that reach patients directly at their home. Commercial pharmacy retailers are also engrained in this space. Walk-up clinics allow patients to speak virtually with a provider, and often without a scheduled appointment. Then, there are EHR vendors looking to expand their core offerings by partnering with large, established heath systems to provide virtual consults and monitoring capabilities to other hospitals across the country. Thus, organizations must take a critical look at the needs of their community and analyze their regional landscape to determine how to tackle the influx of new competitors in their respective markets.

Table 3. Example competitors in current landscape

Disruptor	Description
Direct-to-consumer technology firms	Networks of licensed primary care physicians who diagnose routine, non-emergency medical problems via telephone or video, recommend treatment, and prescribe medication (when appropriate)
Retailers	Offer in-store consultations with physicians through virtual third-party, on-demand physician networks
Health Plans	Covers services provided by these virtual, third-party, on-demand physician networks
EHR Vendors	Partner with established health systems to provide telehealth services within the EHR platform

Regardless of their decision to work with or compete against these new players, health systems are uniquely positioned in the market, particularly because of their ability to provide care across the continuum. New research noted strong discrepancies with Direct-to-Consumer (DTC) providers. The study, which looked at 16 online telemedicine companies, found less than one-third of the DTC vendors disclosed clinicians' credentials, only 32% discussed potential side effects of prescribed medications, and several sites misdiagnosed serious conditions because they failed to ask basic follow up questions.[25] Another study found that DTC providers only received complete histories and conducted thorough exams 52%-82% of the time.[26] These quality outcomes show the importance of ensuring that comprehensive and continuous care is provided to the patient and how valuable it is for local providers to be involved in order to reduce fragmentation of care.

A framework to approach virtual health

The specific issue that each provider organization faces is unique, and carefully choosing which combination of targeted goals, market differentiation profile, and underlying value drivers to focus on is critical to selecting the most appropriate virtual health solutions while minimizing the chances of virtual health program failure.

Table 4. Relevant virtual health goals

Organizational goals	Definition
Customer and digital transformation	An emphasis on creating differentiated customer and digital experiences to attract, serve, and retain patients, with an emphasis on increased growth, patient satisfaction, and leakage prevention across the enterprise
Patient affordability and operational excellence	Focus on improving cost efficiency and scale through the extension and delivery of care at a lower cost, increasing affordability for patients and reducing overhead
Mitigating regulatory risk	Responding to critical regulatory pressures (e.g., MACRA) that have an increased emphasis on advanced, value-based payment models and pressures

Once provider organizations have identified the primary mix of issues and goals to focus on, they should factor in their unique profile and overall market position to identify relevant virtual health technologies that meet their needs.

Table 5. Evaluating your virtual health profile

Profile factors and sample key considerations					
Primary segmentation	**Overall size and geography**	**Patient mix and population**	**Service offerings**	**Value-based reimbursement mix**	**IT maturity**
• For-profit commercial • State and Federal • Not-for-profit commercial • Integrated Delivery Networks • Academic Medical Centers	• Standardized enterprise care delivery • Degree of regional variation • Emphasis on local delivery	• Condition/disease cohorts • Demographics • Health Plan distribution and segmentation • Inpatient/outpatient mix	• Range and depth of specialty and sub-specialty care • Degree of emphasis on unique/differentiated offerings	• Analysis of relative mix of advanced/value-based payment models • Projected mix in 3-5 years	• Relative standardization of IT processes, tools • Data governance and quality • Enterprise IT system portfolio management capabilities

Once organizations have effectively assessed their overall goals and completed a detailed analysis of their unique virtual health profile, they can begin to make focused decisions around which mix of virtual health technologies and organizational capabilities most effectively meets their needs, and can sequence their adoption of the appropriate virtual health technologies to maximize impact.

Table 6. Mapping virtual health technologies to goals and key considerations

Goals and key considerations							
	Primary goals	**Primary segmentation**	**Overall size and geography**	**Patient mix and population**	**Service offerings**	**Value-based reimbursement mix**	**IT maturity**
Example	Customer & digital transformation, with an emphasis on revenue growth by attracting patients and reducing leakage	Not-for-profit commercial	Multi-facility regional over a wide geographic area	Cross-section distribution of demographics, large percentage of underserved patient populations in rural areas	Depth of service line offerings in larger cities, limited service breadth in rural locations	Limited to pilots, <10% of revenue	Medium maturity, with some centralized governance and core functions and an enterprise EHR across all major clinical and revenue cycle workflows
Virtual health implications	• Emphasis on access and experience	• Limited ability to justify high up front capital expenses in budget cycle (e.g. Remote ICU) • Rapidly deployable/ scalable tools	• Distributed geography has potentially underserved and overserved staffing mix across locations	• Limited reimbursement channels • Remote/rural underserved populations require access	• Increased emphasis on virtual specialty referral / consults to address service offering gaps	• Increased emphasis on cost efficiency and self-pay channels	• Reduced emphasis on advanced mHealth technologies and remote monitoring due to heavy analytics / device and data requirements
Relevant virtual health technologies	• Asynchronous virtual visit • Virtual visits (condition-based/primary care) • mHealth – texting/ scheduling interactions	• Asynchronous virtual visit • Synchronous virtual visit	• Tele-home health • Virtual consults	• Virtual consults • Asynchronous virtual visit • Medication Compliance Management	• Tele-radiology • Tele-pharmacy • Virtual consults	• Asynchronous virtual visit • Synchronous virtual visit	• Virtual visits • Simple mHealth technologies

Path forward: Assess organizational capacity to determine strategic approach

Despite the potential value associated with virtual health, many organizations run into issues when proper consideration is not given to resource constraints (financial and personnel), reimbursement considerations, and current technical infrastructures. Below are a list of common questions organizations should review. By understanding these elements, organizations can tailor their strategy to promote successful virtual health planning. For instance, it may make sense to roll out a system-wide telehealth initiative or roll out smaller-scale pilots focused on a certain capability (e.g., remote monitoring or treatment adherence).

Table 7. Key factors to consider when planning your approach

Consideration	Key questions
Financial	• How is the financial strength of the organization? • Are there other large, ongoing investments underway? If so, would they conflict with a virtual health endeavor? • Can the organization invest in new applications or large capital investments now? If so, how quickly could the organization scale up?
Personnel	• Does your organization have staffing bandwidth to support services? Would you need to hire new employees? • Do the financial incentives for clinical staff allow for volume growth? • Does your staff have the technical knowledge and skills to support a virtual health project or would you need to hire outside contractors?
Reimbursement	• Does your state provide reimbursement for virtual visits? • How are relationship with current vendors? Would they be open to exploring new arrangement models?
Technology	• What is the current technology infrastructure? Do you already have EHR capabilities? • Which vendors do you partner with? Do they have virtual health products? • Have you integrated other technologies recently, and if so, how was the process? • Do you already share information electronically with outside providers?

Determine partnership model based on desired capabilities

Based on a health system's maturity, financial health, and desired capabilities, the organization will need to decide how to execute their program of choice. Currently, there are three distinct options:

1. **Partner with a third-party vendor**: Work with external organizations, leveraging their scale and experience, to deliver on-demand services to a specific patient population; potentials reasons for partnership:
   - Strong relationship already established
   - Leverage external scale and experience
   - Lack of internal resources needed for build, test, and implementation

2. **Create a customized internal platform**: Build own tool to allow for more customization and keep data in-network; potentials reasons for partnership:
   - Potential cost constraints
   - Smaller platform needs
   - Previous experience standing up technical environment
   - Skilled and experienced staff available

3. **Implement a hub and spoke model**: partner with other health systems to centralize virtual delivery and act as a spoke to a larger virtual health hub station; potentials reasons for partnership:
   - Strong relationships with affiliation organizations
   - Strong internal stakeholders support
   - Credential and licensure barriers low

Understand stakeholder needs

Finally, the organization must understand how to bring all stakeholders into the planning. This includes clinical and operational staff, third-party contractors as well as patients and caregivers. Each stakeholder group has its own set of needs and thus, it will be important to have representatives from these groups involved as planning and implementation gets underway. Even more, keeping these groups engaged, from initial project planning through implementation and go-live, will be critical and tactics will vary based on the stakeholder group.

Internal staff—For clinical staff, organizations should explore creative financial incentives, looking at RVUs, productive outcomes, and engagement metrics within differentiated payment models (incentives separated from base salary).[27] As for operational staff, incentives can be tied to completing project timelines by due date (or earlier) as well as increasing formal job roles and supplementing salaries accordingly.

Third-party contractors—These relationships are usually more formal in nature and therefore engagement can be addressed in contracts during the project onset. For instance, organizations will need to demonstrate to payors that the services provided are improving metrics, reassuring them that utilization is appropriate and effective. Thus, organizations may look to enter agreements that provide these reassurances.

Consumers/end users—Organizations may want to utilize a Customer Relationship Management (CRM) tool, which can enhance an organization's ability to attract, engage, and retain patients through coordinated and optimized patient experience.

Virtual health stakeholder groups

Internal staff
- Clinical includes providers, nurses, case managers, etc.
- Operational includes IT, billing, department lead, etc.

Third-parties
Includes vendors, payor plans, at the elbow support, etc.

Consumer/End user
Includes patients and caregivers

Example: Putting it all together

Based on the framework that has been laid out, the sample profile below shows the steps that a health system needs to undergo in order to execute virtual health delivery in their organization.

1. **Align on organizational goals for virtual health technology**
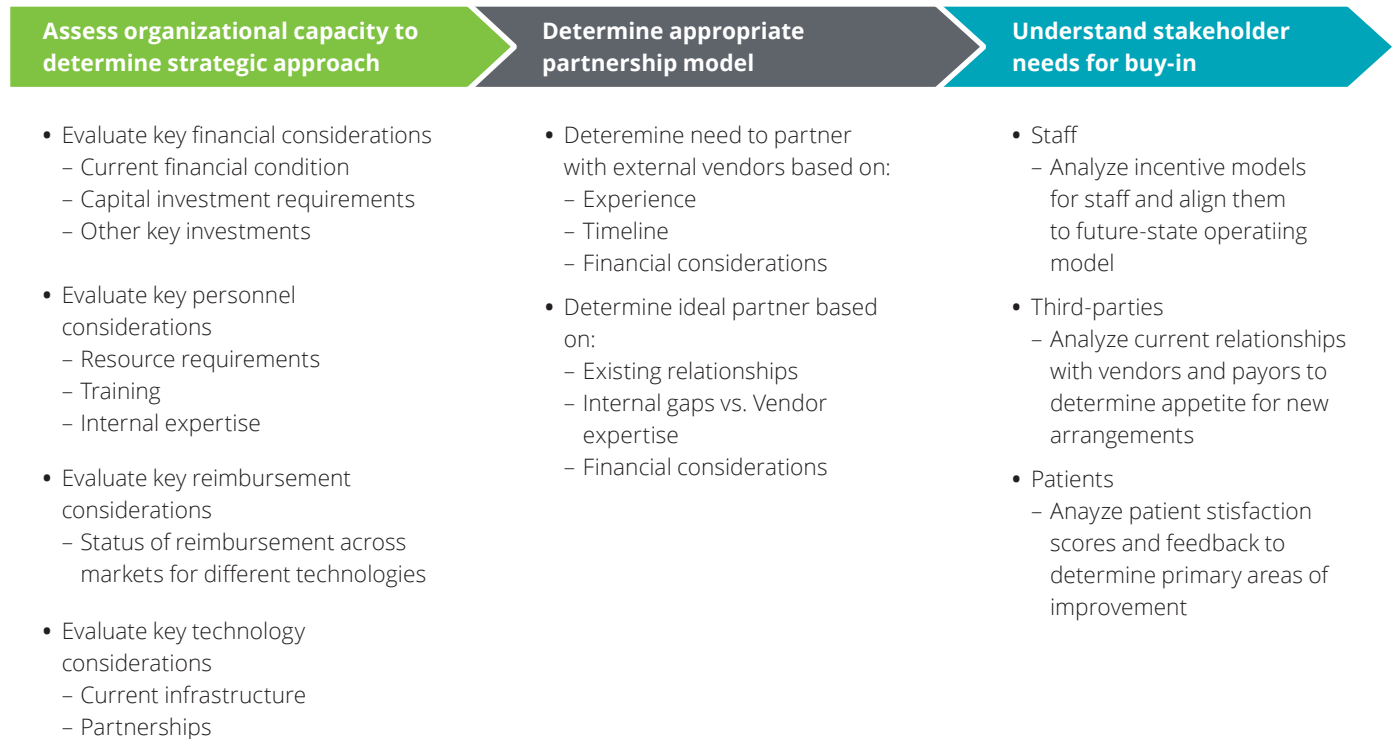   - Improve operational efficiency and patient affordability

2. **Assess virtual health profile**

   Not-for-profit commercial health system

   High emphasis on regional delivery

   Diverse demographics with large percentage of chronic care patients in rural areas

   Disparate depth of service line offerings based on region

   High focus on value-based reimbursement

   Medium IT maturity (e.g., centralized governance model, system-wide implementation of EHR)

3. **Select potential technologies for further exploration based on the organizational goals and profile**
   - Virtual visits
   - Virtual consults for specialty care
   - Remote monitoring
   - Basic mHealth technologies (scheduling, check-in etc.)

4. **Prioritize technologies and determine implementation approach**

Assess organizational capacity to determine strategic approach	Determine appropriate partnership model	Understand stakeholder needs for buy-in

• Evaluate key financial considerations
  – Current financial condition
  – Capital investment requirements
  – Other key investments
 	
• Evaluate key personnel considerations
  – Resource requirements
  – Training
  – Internal expertise
 	
• Evaluate key reimbursement considerations
  – Status of reimbursement across markets for different technologies
 	
• Evaluate key technology considerations
  – Current infrastructure
  – Partnerships
	• Deteremine need to partner with external vendors based on:
	  – Experience
	  – Timeline
	  – Financial considerations
	
	• Determine ideal partner based on:
	  – Existing relationships
	  – Internal gaps vs. Vendor expertise
	  – Financial considerations
		• Staff
		  – Analyze incentive models for staff and align them to future-state operatiing model
		
		• Third-parties
		  – Analyze current relationships with vendors and payors to determine appetite for new arrangements
		
		• Patients
		  – Anayze patient stisfaction scores and feedback to determine primary areas of improvement

Bottom line

As virtual health evolves and becomes a mainstay for health care organizations to deliver patient care, proper planning will be essential to ensure long-term success. This includes understanding the market landscape, overcoming barriers to adoption, and determining a strategic enterprise-wide approach to implementation that aligns with the organization's mission, vision, and values. Furthermore, as virtual health delivery expands to include wearables, mobile apps, and other new diagnostic and treatment technologies, organizations with a strong foundation will be better positioned to build out advanced capabilities.

Appendix Table 1: Virtual health definitions/technologies[28]

Initiative	Care area	Impact
Tele-radiology	Radio-diagnosis	• Improved time-to-read and time-to-diagnosis across facilities • Lower labor costs especially in rural and semi-urban facilities • Addresses shortage of highly skilled radiologists
Remote monitoring	Population health, Transitional care, Chronic care	• Continuous monitoring with predictive analytics can help detect adverse events early or even before they occur avoiding cost of hospitalization • Early discharge -> reduced office visits ->lower costs
mHealth	Operations/Multiple areas (Scheduling, Education, Monitoring, Compliance)	• Allows patients to more easily access health care information • Increases patient engagement • Improves ability to detect and track diseases
Remote ICU	Emergency care, Intensive care	• Addresses potential shortage of critical care nurses and physicians through standardized and centralized ICU monitoring
Virtual consults	Specialist Consults (e.g. Dermatology, Ophthalmology, Neurology, etc.)	• Improves access to specialists • Reduces cost of resources while addressing shortage of certain specialties
Virtual visits	Chronic Care, Primary Care Visits, Transitional Care, Chronic Care	• Increases patient access to providers • Increases provider productivity • Enables early discharge from inpatient facilities • Increases frequency of monitoring of parameters essential for improved care of chronic conditions such as Diabetes
Tele-pharmacy	Prescriptions, Dispensing	• Addresses shortage of pharmacists in remote areas • Improves productivity and lowers costs by reducing need for on-site pharmacists during off-peak hours
Medication Compliance Management	Drug Adherence, Follow-up Care, Chronic Care	• Improves adherence to medication regimen • Increases patient engagement in chronic care • Provides multiple avenues for health & wellness education
Tele-home health	Continuing Care, Chronic Care	• Increase in provider efficiency • Provides rapid access to providers for specific consults without need for travel
Tele-translation	All Areas—Translators	• Improves comprehension of care plan by patients • Improves compliance and overall patient satisfaction

Appendix Table 2: CMS demonstrations involving telehealth[29]

Initiative	Description	Telehealth implications
CPC+	The risk-based primary care initiative aims to accelerate the shift toward value-based reimbursement and emphasizes health IT and chronic care management. The model builds on the Pioneer ACO Model and the Medicare Shared Savings Program. It sets financial targets, enables greater opportunities to coordinate care, and aims to incentivize high quality care.	Participating practices will be responsible for giving patients 24-hour access to care and their information, delivering preventive care, engaging with patients and their families, and coordinating care with hospitals and other clinicians, such as specialists. Telehealth might help meet these requirements. Providers may decide to use the incentive payments to invest in telehealth.
ACO Next Generation	The model's goal is to test whether strong financial incentives for ACOs, combined with tools to support better patient engagement and care management, can improve health outcomes and lower expenditures for original Medicare FFS beneficiaries.	CMS waives certain telehealth restrictions for ACOs in this model. Originating telehealth sites do not have to be in rural areas or originate from a medical facility (they can originate from the patient's home).
CCJR	This model began April 1, 2016. It tests bundled payment and quality measurement for knee and hip replacement episodes of care. Participating hospitals are financially responsible for the cost and quality of these episodes of care.	Under bundled payments, providers have the incentive to use any service they believe can reduce the cost of care and improve quality. This model waives the requirements that the originating site for telehealth services must be in a rural area and be a specified medical facility (they can originate from the patient's home).
BPCI	This voluntary program began in 2013 to test bundled payments in Medicare and their ability to reduce Medicare spend while maintaining or improving quality. Participating organizations assume financial and performance responsibly for episodes of care triggered by a hospital admission.	Participating organizations can choose among several waivers, including a telehealth waiver similar to the above programs that eases geographic restrictions, though the originating site cannot be the patient's home.

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