

IN-DEPTH

## HEALTH INNOVATIONS



# Staying Well, Virtually

In the ever-growing field of telehealth, key players are using innovative methods to change access to—and the experience of—health care. **BY SARAH ASP OLSON**

It didn't take long for Dr. Dennis Truong to assess that his 27-year-old patient was sicker than she was letting on. She complained of a urinary tract infection, but her sweaty, pale complexion, along with key background information available in her medical record, told Truong a different story.

"After probing her more, she let me know she's been having fevers and back pain, basically all the

symptoms of a pyelonephritis or urosepsis—a kidney infection," says Truong, an emergency medicine specialist at Kaiser Permanente's Mid-Atlantic Permanente Medical Group.

His patient was busy and reluctant to take time away from work, but after their consultation, Truong was firm: She should leave what she was doing and go immediately to urgent care.

Up to that point, Truong, who also serves as director of telemedi-

cine and mobility and assistant physician in chief of the Northern Virginia service area, had been communicating with his patient via Kaiser's Virtual Visit platform. In fact, had it not been for the virtual connection, the woman's story may have had a very different ending.

"The patient said [she] wouldn't have gone into the clinic because she was really busy at work and didn't want to step away," says Angie Stevens, executive director of

telehealth at Kaiser Permanente.

Kaiser Permanente is considered a leader in the field of telehealth and has been providing patients across its seven-region U.S. network with virtual care options for years, starting with nurse lines. As technological advances have allowed for higher quality virtual consultations, Kaiser has increased its telehealth offerings. In 2015, virtual visits outnumbered in-person office visits systemwide for the first time. The increase is representative of a broader shift in the way today's patients, providers and payers interact with health care.

According to the American Telemedicine Association, about 750,000 patients will access more than 1.25 million online consultations this year. But online visits are just one aspect of the burgeoning telehealth field.

#### WHAT IS TELEHEALTH?

According to the Center for Connected Health Policy, "Telehealth is a collection of means or methods for enhancing health care, public health and health education delivery and support using telecommunications technologies."

While the term *telemedicine* has been used interchangeably,

*telehealth* is now "more commonly used as it describes the wide range of diagnosis and management, education and other related fields of health care," according to the CCHP. That definition represents a wide range of products, platforms and services used to enhance care—from video visits to remote monitoring to electronic prescription fulfillment.

"I think about telehealth as a means to an end," says Mario Gutierrez, executive director at CCHP. "That end is improving health equity and access to care regardless of the obstacles in your way—whether it's distance, disability, language, etc. It's also an extremely valuable tool that has great potential to achieve the so-called triple aim of health care reform: it improves the quality of the patient experience, improves the quality of outcomes and it saves money."

As advances in technology as well as state and federal policies pave the way for telehealth to become standard practice, companies are emerging as leaders in delivering high-quality, high-tech care.

#### VIRTUAL SYSTEMS, TANGIBLE CARE

In a 2014 telemedicine survey of

health care executives from across the country, 84 percent said telemedicine services were important to their organizations and 90 percent reported that they are developing at least one telemedicine solution. Only 8 percent of survey respondents reported that they had no telehealth services at all, indicating that some form of virtual care is already present in the majority of care settings.

In fact, it's possible that patients aren't even aware they're being treated using telehealth, says Jonathan Linkous, CEO of the American Telemedicine Association. "For example, the most common area in telemedicine is teleradiology, where you have an x-ray, breast exam or MRI read by a radiologist who is located some distance away."

While this is one example of how telehealth has become common practice in hospital and clinic settings, some health systems are making a concerted effort to bring telehealth to the fore.

#### HEALTH CARE WITHOUT WALLS

Mercy Virtual Care Center is located in Chesterfield, Missouri, but its mission expands far beyond its high-tech walls. The 125,000-square-foot building doesn't house a single patient.

Instead, on any one of its four floors, you'll find teams of medical professionals monitoring highly sensitive cameras and real-time vital signs. From their connected work stations, Mercy clinicians can monitor patients in any one of the system's 4,000 fully integrated hospital beds, inside clinics and in some cases in patients' own homes.

The center is the first of its kind in the world, but it draws on an old concept. Mercy's founding can be traced back to the Sisters of Mercy, an Irish sisterhood that refused to be cloistered. With this concept at its heart, Mercy Virtual's aim is

## THERE'S AN APP FOR THAT

The following direct-to-consumer apps were selected among Healthline's best telemedicine apps of 2016. Selections were made based on overall quality and user ratings.

**1| AMWELL.** The consumer-facing arm of American Well allows patients to connect with a primary care physician, therapist, pediatrician or dietician. Providers in all but two states can even prescribe medication.

**2| FIRST OPINION.** This iOS app allows free messaging with a provider. Patients can upgrade for treatment and additional features.

**3| MDLIVE.** For an average of \$49 per visit, U.S. board certified health care providers—including therapists—are available around the clock and can diagnose, prescribe and update electronic medical records on a secure server.



to move from provider-centric to patient-centric systems.

“What if across the board we were building care plans that stayed with the person—a health optimization plan that we’re moni-

toring 24-7, 365?” asks Mercy Virtual President Dr. Randall Moore, MBA. “Would we really change the health of people? Could we really impact . . . the cost of health care?”

Data since opening Mercy

Virtual Care Center in 2015 have answered those questions. As a direct result of round-the-clock virtual monitoring of intensive care units across the Mercy system, about 1,000 more people

## CONNECTING PATIENTS AND PROVIDERS

### LIFEMD: BRINGING DOCTORS TO SCHOOL AND BEYOND

Mark Vollaro started LifeMD because he saw many organizations struggling to find a telehealth partner who could successfully deliver proprietary products and services in three primary components of telehealth: a strong network of physicians and providers; HIPAA-compliant software; and hardware that allows providers to examine a patient remotely.

In May, LifeMD contracted with the Los Angeles Unified School District to provide mobile exam carts to select schools. If a student complains of a nonemergency health concern, say pinkeye, he goes to the school nursing station and sits in front of the cart, the operator puts the peripherals (otoscope, thermometer, etc.) on the student and the pediatrician comes in remotely. If it’s an irritated eye as opposed to pinkeye, the doctor can sign off and the child can return to class.

The software platform saves the visit for the child’s medical records, primary doctor and insurance. Parents can sit in remotely or receive a link to review later. For Vollaro, it’s about keeping kids well, saving parents and schools time and money and leveling the playing field for those who don’t have ready access to care. LifeMD’s school carts are currently equipped to handle common, nonemergency symptoms, but Vollaro hopes to eventually introduce tools for monitoring diabetes and nutrition.

### AMERICAN WELL: THE AMAZON OF TELEHEALTH

American Well entered the telehealth

scene about 10 years ago by partnering with insurance providers, offering virtual connections as a benefit to members. A patient on a supported health plan would log in through an app or browser and be able to initiate a live video visit with a physician in the network.

“We’ve always believed the interaction between you and the physician should be as close as possible to the traditional way you see the doctor,” says CEO Dr. Roy Schoenberg. “It really was designed from the ground up as an infrastructure to facilitate traditional health care through technology.”

Today, more than 100 million Americans connect to telehealth services through major insurance providers using American Well’s platform. Its consumer app, Amwell, is the most downloaded telehealth app in the country. As technology evolves, American Well is providing seamless connections between patients and providers. The company recently launched the Exchange, a program aimed at connecting providers, payers and patients who use its services.

“We know more than 200 different organizations use American Well as an infrastructure and each develops its own telehealth program, but every one of those is an island,” says Schoenberg. “[With the Exchange] we introduced the capability for all of them to talk to each other and exchange telehealth services.”

As Amazon did with online retail, Schoenberg envisions the Exchange as a national platform on which online health care runs: a “marketplace where the services of the brands you know and trust

are going to be made available over all of the other systems.”

### SNAPMD: PRIVATE LABEL FOR LOCAL, COMPLEMENTARY CARE

Born out of the master’s of medical management program at the University of Southern California, SnapMD was founded to empower existing care providers of all sizes to offer virtual visits as a complement to their care models.

“When we examined the market, the opportunity we saw in that mission was to improve patient care in America by increasing access and convenience,” says CEO and president Dave Skibinski. “Through that, you’re able to improve compliance and better engage patients who need more intensive treatment.”

When SnapMD launched in 2013, its business model set it apart from early telemedicine providers

“We saw the opportunity to partner with health systems—and really any entity that provides health care—that is established in the community [it serves]. Our business is to help them innovate and offer virtual visits as a complement to the standard of care.”

One such provider, Brookwood Baptist Health, manages five hospitals in Alabama. The system was new to telehealth when it partnered with SnapMD to launch its first virtual care platform for employees. Two years later, Brookwood is ready to roll out virtual services to patients in population health management and primary care.

“They are extending their care under their brand direct to the patient population they serve,” says Skibinski.

than expected survived. In addition, ICU patients spent a total of 90,000 fewer days in the hospital, meaning “we avoided just under \$50 million of cost while getting a better outcome for people,” says Moore.

Mercy started a pilot program applying the same model to 10 outpatients who, between them, had 164 hospital visits in the previous two years. “We replicated the same oversight in the home and we took their [hospital utilization] down by about 70 percent in 90 days,” explains Moore.

This is just the start. Moore envisions a future where virtual care is invisible to the patient as it becomes an integrated, normal part of health care nationwide. “We are focused on transforming the system versus incrementally extending it,” he says.

### IN-HOUSE INNOVATION

In many aspects of care throughout its three-state network, Cleveland Clinic is involved in delivering telehealth care to patients—from synchronous interactions such as urgent care video consultations to asynchronous online second opinions.

In addition to making use of state-of-the-art telehealth technology, Cleveland Clinic has its own innovation arm working to, among other things, leverage the innate hardware capabilities of mobile devices. One prime example is Cleveland Clinic’s Concussion (C3Logix) app, which uses the iPad’s gyroscope and accelerometer to collect data on an athlete’s cognitive performance, manual dexterity, coordination and stability. After getting a baseline reading, if an athlete suffers a head injury

on the field, trainers can redo the testing to determine whether there is significant decline in function, pinpoint areas of concern and guide therapy. Data the app collects can provide a more objective metric than a neurological exam to determine when or if an athlete should return to play.

While the app is working well in its athletic capacity, Cleveland Clinic has leveraged the C3Logix technology to monitor and manage patients with neurological conditions, such as Alzheimer’s, stroke and multiple sclerosis.

“In the MS population, when patients come into our clinic, we put them through a similar active process of assessment to provide objective data on how well [they] are performing,” says Dr. Peter Rasmussen, medical director for distance health and a neurosurgeon at Cleveland Clinic.

Data is tracked, mapped and stored, giving patients and providers objective measurements of improvement over time.

“The vision is to move that testing to the patient’s home so we can do testing more frequently and have it reported via internet or app,” says Rasmussen, who envisions a virtual cloud-based system with the “goal of having no patient come into the brick-and-mortar facilities unless we have to lay hands on them.”

### STROKE CARE IN SECONDS

Memorial Hermann Mischer Neuroscience Institute in Houston is one of the most advanced institutes for stroke care in the world.

Through its telemedicine program, launched in 2010, it has developed high-tech audio- and video-enabled robots, which allow stroke specialists to be at the bedside of patients within minutes of their arrival at one of 18 connected emergency facilities in the region. A stroke neurologist can examine the patient, consult with family

## Q & A

California’s Center for Connected Health Policy was initiated by the California Health Care Foundation to provide guidance to state policy makers, health systems, consumers and payers on the laws, regulations and policies related to telehealth, and to assist with reforming those policies for underserved populations. In 2012, the organization applied for a four-year federal grant to broaden its scope to the national stage, and the National Telehealth Policy Resource Center was formed. Mario Gutierrez of the NTPRC discusses how telehealth has evolved.

### Q: WHAT IS CCHP’S ROLE IN SHAPING TELEHEALTH POLICY?

We’ve had that grant for four years to do what we did in California on a national level and to work with 12 other regional telehealth resource centers that provide technical assistance to organizations that are interested in starting telehealth or improving existing services. [We also] focus on the federal government, which has the most outdated, archaic policies related to connected care and virtual care.

### Q: WHAT IMPROVEMENTS ARE YOU SEEING?

We’ve seen incremental

change where . . . telehealth [is recognized and understood] as not just some kind of esoteric high-tech tool that specialists use in hospitals, but as something that should be accessible to everybody and has a benefit for everybody. . . . We have all these incredibly qualified specialists located all over the country that have the capacity to provide care to those who need it, but because we don’t live in the state where that specialist is, we can’t access them. I can’t imagine how in the next 10 years there’s not [going to be] a major change in the way licensing for telehealth takes place.

members and pick up on symptoms another physician may miss.

“You want the best neurologist, the one who has seen the most strokes and has the most experience dealing with your brain in an acute situation,” says Dr. Tzu-Ching Wu, director of telemedicine at MHMNI and assistant professor at McGovern Medical School at UTHealth. “Technology brings that physician there.”

Memorial Hermann is among a rapidly expanding network of hospitals using telehealth to improve outcomes.

The system is also a leader in treatment that starts even before

arriving in the emergency room: In 2014, UTHealth and Memorial Hermann-Texas Medical Center deployed the country’s first mobile stroke unit. Equipped with a CT scanner, laboratory and telemedicine capabilities, the unit accompanies first responders when a stroke is expected. Mobile stroke team members can diagnose and treat patients with medication onsite, saving precious minutes and brain cells.

#### DIGITAL MEDICINES

Fewer than half of those with chronic conditions—such as type 2 diabetes or heart disease—take

their medication as prescribed, according to the World Health Organization.

It’s this knowledge that led Proteus Digital Health to create an innovative new product with a simple goal: to help those living with chronic disease track and share that information with physicians and caregivers. This represents a new category the company calls “digital medicines.”

Therapies include “drugs that communicate when they’ve been taken, wearable sensors that capture your activity and rest patterns and applications for your mobile device that help you take charge of your health,” says Andrew Thompson, co-founder and CEO of Proteus Digital Health.

In the case of the Proteus Discover product, a tiny, ingestible sensor embedded in a pill sends a signal to a patch worn on the patient’s torso. A digital record goes to the patient’s mobile device and is uploaded to the cloud through a secure web portal, where her provider can access the information with her permission.

Proteus Discover “not only empowers patients, but provides physicians unprecedented insight into patient medication-taking and daily health habits,” says Thompson. “We remove the guesswork around diagnosis and treatment. If physicians don’t have [this information], they are frequently not able to help their patients get on the correct drug or the right dose.”

#### PHYSICAL EXAMS AT HOME

In a 2015 American Well survey, 64 percent of consumers said they would willingly have a video visit with a doctor. Most cited convenience as the number one benefit, but the majority also had a major concern: How would the doctor examine the patient?

Despite telemedicine’s fast growth, “it still lacks a cornerstone of any medical practice, which is

## Q & A

The American Telemedicine Association has been operating for 24 years with the goal of transforming the delivery of health care. With nearly 10,000 individual members and about 500 companies and health institutions, ATA develops standards and guidelines and has accredited a handful of companies providing online consultations. Jonathan Linkous of the ATA weighs in on what’s to come.

#### **Q: IN WHAT WAYS DOES TELEHEALTH MAKE SENSE WHEN LOOKING TO IMPROVE THE TRIPLE AIM OF HEALTH CARE: QUALITY, EQUITY AND AFFORDABILITY?**

A: First of all, it expands access. There’s no question that people who are in remote areas or even areas that can’t get access to a physician of any sort can do that thanks to telecommunications. In terms

of quality health care, you get people who have a stroke and can now be seen [instantly] by a neurologist. We think that through telemedicine you’re getting better care in many cases than you would otherwise.

Finally, it reduces costs. People with chronic conditions . . . if you can provide some kind of regular monitoring and take care of them before they hit a crisis stage, you can avoid sending them to an ER or admitting them to a hospital, and that saves an enormous amount of money.

#### **Q: WHAT DO YOU SEE AS THE FUTURE OF HEALTH CARE GIVEN THE CONSTANT FORWARD MOMENTUM OF HEALTH CARE-RELATED TECHNOLOGY?**

A: It’s certainly accelerating yearly, almost monthly. It’s no longer this unusual,

interesting little project that’s going on in one area; it will soon be fully integrated into the practice of your own local physician.

#### **Q: WHAT CHALLENGES EXIST IN THE FIELD OF TELEHEALTH?**

A: One is privacy. Is the information secure? Does the patient have control? From a payer point of view: Is this going to increase costs as more people access health care?

For providers, a big concern is a lot more data—how do you manage that? It’s really important how you go about doing it, the approach that’s used and the applications used as you implement this type of health care. [It should] empower the patient and actually reduce workflow rather than increase the workflow [for providers].



the physical examination,” says Dedi Gilad, co-founder and CEO of Tyto Care, a company that recently launched TytoCare, a comprehensive telehealth solution. “Tyto is really about replicating the physical exam and all the things a physician would normally do face-to-face.”

The Tyto device, which comes with a number of tools, attachments and smart technology, fits neatly in an adult palm and comes equipped with peripherals to capture heart and lung sounds as well as high-resolution images of the skin, ears and throat. Users send exam results to their own doctors or initiate a telehealth consultation with a remote provider. While some TytoCare products don’t need to be used in conjunction with a trained provider, diagnoses and exam interpretations are best made by someone with medical training.

“You as a consumer are not really used to looking into the ear canal or listening to lungs or heart,” says Gilad. “These are all qualitative readings, so you need a clinician to diagnose those. We developed a unique guidance capability [using] machine learning and algorithms to position the device against the body and guide the user to the correct location, correct maneuvering . . . the right pressure, amount of time and level of quality the clinician would need for a diagnosis.”

According to Gilad, the open platform and versatility of Tyto make it adaptable across a wide variety of applications—from home use to clinics to schools and beyond.

“We are working with telemedicine companies, not replacing them,” he says. “We are taking their promise and expanding it to make it more efficient.”

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[karonmd.com](http://karonmd.com)

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## EXPANDING CANCER CARE

Part of Dr. Thomas Schwaab's job as the chief of strategy, business development and outreach for Roswell Park Cancer Institute in Buffalo, New York, is to ensure that all patients receive the same high quality of care whether they check into the downtown Buffalo location, satellite campus or affiliated community practice.

"We have a mission and that is to deliver the highest quality cancer care to as many people as we can reach," says Schwaab, who is also a urological oncologist at Roswell Park. "Until recently that reach was limited to as far as people were willing to travel. Now, telehealth allows us to reach much farther."

In 2015, Roswell Park announced it would partner with Lakeshore Cancer Center in Lagos, Nigeria. The joint venture opens the door for remote clinical consultations and professional education opportunities, among other things.

"We will soon be able to provide radiation therapy from thousands of miles away," says Schwaab.

The partnership is just one way the institute is using technology to reach as many patients as possible. Through telehealth services, the National Cancer Institute-designated comprehensive cancer center expects to be able to soon provide multidisciplinary care to patients throughout the system and is in the process of setting up a network to bring clinical trials to patients hundreds of miles away.

"The possibilities are limitless," says Schwaab. "All you need is properly communicating software and... you can collaborate on research, clinical trials, quality incentives, clinical integration—there's a lot of opportunity, and... obviously, patients benefit from it." ▀

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