Reaching the Remote: Telemedicine Changing Rural Healthcare

As telehealth continues to evolve, new methods have emerged to better serve rural and underserved communities.

By Paul Nicolaus

November 16, 2016 | "There is an explosion of medical knowledge occurring in the world," said Sanjeev Arora, distinguished professor of medicine at the University of New Mexico. More knowledge has been created in the last 50 years than the previous 2,000 years, and yet massive health disparities exist.

"The problem is that this knowledge is not getting to the last mile of health care, especially to underserved people," he said, noting that so many throughout the world simply do not have access to the right knowledge at the right place at the right time.

His mission? Reducing this sort of disparity by democratizing medical knowledge. His secret? Harnessing the vast powers of telecommunication.

Teaching to Fish

A gastroenterologist and liver disease specialist, Arora was doing the best he could to treat Hepatitis C back in 2003, but the outlook was grim. In New Mexico alone, there were 20,000 patients who'd been diagnosed, and yet no primary care doctor was treating the disease.

Even though patients can and do die from Hepatitis C due to liver failure or cancer, less than 5% of infected patients in the state had actually received treatment. Some were driving hundreds of miles both ways to receive care at Arora's clinic, and huge wait times—eight months at that point—meant that

those who were fortunate enough to receive medication were receiving it late.

It was while attempting to figure out how to manage this dilemma that Project ECHO (Extension of Community Health Outcomes) was born. The concept behind it involves linking expert specialist teams at an academic hub with primary care clinicians in local communities.

Those clinicians become part of a learning community, where they receive mentoring and feedback from specialists. Together, they manage patient cases to provide needed care. The director of Project ECHO pointed out that the format differs from traditional telemedicine. Although real patients are managed using this model, the main focus is on the professional development of clinicians.

“In other words, we are teaching people to fish rather than giving them fish,” Arora said. “We are making them experts so that the overall capacity in the world goes up 10 times, 100 times.”

Spreading Knowledge

Initially, 21 Centers of Excellence were set up throughout New Mexico to help treat Hepatitis C in particular: 15 in federally qualified health centers and five in the prison system. Guidelines were shared, but there were no specialists in these health centers or prisons, so each Center of Excellence was run by a nurse practitioner, physician assistant, or family doctor.

The main challenge was that they had never actually been trained how to treat this disease. Using case based learning, the participants were taught to become just as effective as university experts. After all, this is the same method that allowed Arora to become an expert while carrying out his residency and fellowship requirements, he pointed out.

At the heart of the program is the weekly telecommuting. “All these 21 people join in an interactive video conference all together like Hollywood Squares,”

he said. One by one they present patients on Hepatitis C, and that case is discussed. During the weekly two-hour session they co-manage about 10 patients, followed by a 15-minute lecture.

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Over the course of time, several things occurred for those involved. Levels of clinician satisfaction went up and professional isolation went down, explained Arora. Their self-efficacy of treating Hepatitis C went up dramatically, and access to patients improved as well.

In just 18 months, the wait time at Arora's clinic shrunk from 8 months to 2 weeks because everyone could be treated in their local communities. Patients who otherwise had no chance were receiving care and getting cured. Lives were being saved.

Arora tracked the outcomes and published his findings in the *New England Journal of Medicine* (DOI: 10.1056/NEJMoa1009370). The Project ECHO model actually produced the same level of cure as the universities. "They were as good as us now," he said, "and that was a very important finding."

As ECHO was working and access was improving, the program expanded to cover other disease areas, such as diabetes, rheumatology, HIV, mental health disorders, and chronic pain. Gradually, a portfolio of over 20 programs was built up at 400 sites in New Mexico.

From there, other schools were taught how to run the program. To date, 94 universities across the globe have been equipped to run Project ECHO, and a version of this called SCAN (Specialty Care Access Network); ECHO has been implemented by the Department of Veteran's Affairs.

“We are currently in 17 countries and 57 different disease areas, and the model is rapidly expanding,” Arora said, noting that tens of thousands of clinicians and millions of patients have been impacted. “Our goal now is to improve the lives of one billion people by 2025 all over the world.”

Quick, Convenient Care

Project ECHO is hardly the only example of medicine being turned on its head using today’s technologies. The for-profit sector is catching on as well.

“What we’ve learned is that over one-third of Americans say that they have difficulty accessing non-emergency care during evenings, weekends, and holidays or if they live in rural or underserved areas,” said Lena Cheng, VP of enterprise marketing and medical affairs with Doctor on Demand.

“At a time when healthcare costs are rising but access to healthcare is still a struggle for so many Americans we really believe that we offer an opportunity to provide high quality care that is less costly and faster than it ever has been before,” she added.

For urgent care, there is nothing more than a two to three-minute connection time, and for mental health care, an appointment is usually available within 24 to 48 hours. Patients simply grab their smartphone, tablet, or computer, and after downloading the app and providing some basic information they can connect live with a board certified physician or mental health professional using video conferencing technology.

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A full range of urgent care issues are addressed in this format: everything

from coughs, colds, the flu, rashes, GI issues, sprains, and strains. Of the top 20 issues treated in brick and mortar urgent care facilities throughout the country, 18 of those can be addressed effectively using this video model, according to Cheng. Beyond that, the mental health practice treats a full range of issues such as obsessive compulsive disorder, mild to moderate depression, as well as grief and couples counseling.

In the process, Doctor on Demand works directly with consumers, large employers, and national and regional health insurance companies such as UnitedHealthcare, Humana, and many of the Blue Cross Blue Shield plans.

While there are a number of ways that telemedicine can be administered, Cheng noted that the video component serves as the foundation of Doctor on Demand's clinical model. It's what allows the chance to gather a general sense of how someone is looking or feeling, and it also allows the ability to zoom in and take a closer look at a pink eye or rash, for example.

"What we're finding is that video is really across the board regarded as the most responsible way to practice telemedicine," she said, "and our goal at Doctor on Demand is to practice medicine that is as safe and responsible as possible. The way we look at that is we need to mimic as best we can an in-person medical visit, and the video piece of it really allows us to do that."

Costs vary across the company's lines of business. An urgent care visit is $49, psychology visits cost $79 for a 25-minute visit or $119 for 50 minutes, and psychiatry visits are $219 for a 45-minute initial work-up and assessment and $99 for a 15-minute follow-up.

The flexibility is a big draw. "Many of our patients who get these services through employers take the calls at home. They can do it from the privacy of their office, they can pop into a conference room, they can be doing it while they're traveling on the road, in a hotel room, or somewhere else," Cheng said.

Connectivity Conundrum

Telehealth has certainly caught on as the benefits continue to be revealed. It is estimated that 61% of health care institutions and between 40% and 50% of all hospitals in the United States currently use some form of telehealth, according to a report released by The US Department of Health and Human Services (HHS) in August.

While the update sheds light on the potential of this emerging form of medicine to better reach those in rural or underserved populations, it also examines some of the pitfalls that still need to be overcome moving forward. One of the most obvious pertains to connectivity, since not all rural areas have the communications infrastructure to effectively harness the potential of telehealth.

Fifty-nine million Americans currently reside in Health Professional Shortage Areas, and many of these lack strong broadband connections, the report notes, with 53% of rural Americans lacking access to benchmark service.

When looking at the infrastructure and investment needed to enhance Internet capabilities in any given area, it's important to take a holistic economic view of what happens when someone in a rural setting is unable to perform because they are sick or have to travel extensively to obtain treatment that could have been received in a more efficient manner, explained David Muntz, principal with Muntz and Company LLC.

When a patient unnecessarily drives a long distance from one location to another in order to be seen by a provider, it affects not just the micro economy of the family but also the economy on a macro level, he said, noting that value models failing to consider the lost opportunity cost of the patient wind up missing out on the true advantages of telehealth.

While utility companies are the most likely candidates for making the necessary infrastructure improvements, they may not have the financial

incentive needed to move forward without receiving support from the government.

"That's why a public/private partnership seems to make the most sense," Muntz said. "There has to be clever people who can figure out how to provide the appropriate subsidies and reward systems to encourage utility companies that have the capabilities but not necessarily the economic advantages."

The FCC and its Connect2Health Task Force launched a mapping tool intended to help identify and visualize those areas where broadband could be enhanced in order to improve access to health care.

Using data from the Robert Wood Johnson Foundation's County Health Rankings, the Mapping Broadband Health in America initiative makes it easier to study the connection between health outcomes and broadband availability.

The map offers up an interactive experience that allows those who could make a difference—healthcare providers, technology companies, policymakers, and others—to consider broadband and health data at the national, state, and local levels. It's one way to identify not just problem areas but areas of opportunity.

After all, it is common for regions with worse broadband access to have more in the way of health problems. The Connect2Health Task Force has revealed that the health of connected communities looks significantly different than their more isolated counterparts.

In communities where 60% of households lack access to broadband and over 60% lack basic Internet connections at home, for example, obesity prevalence is 25% higher and diabetes prevalence is 35% higher.

Additional Challenges

From Muntz's vantage point, while connectivity issues certainly remain, they

are no longer the biggest barrier that telehealth needs to overcome. And his vantage point stretches back quite a ways.

In the early 90s, he was involved in a telehealth pilot with AT&T and Texas Presbyterian Healthcare System. The cost at that time, he said, was enormous. But the idea behind it had potential.

The goal was to show that diagnostic types of work could actually be handled over a wire connection. Used in a nursing home setting to handle dermatological diagnostics, the program helped catch over 60 different melanomas—remotely—in just three months of activity.

“It was obvious then that telepresence was a significant benefit and could have a real and meaningful impact,” he said, “and I’ve been a fan of it ever since.”

The good news is that the cost of connectivity has since dropped. It’s not the technology that needs to catch up, Muntz said. It’s the policy.

“Part of it has to do with the fact that even though the technology is relatively old, the laws and the regulations and the rewards systems haven’t caught up yet with the capabilities,” he said. “The analog way of delivering care was supported by policies and payment models that are outdated.”

According to Muntz, legal policy, liability, and financial rewards are all lingering challenges that need to be tackled for telehealth to continue to grow and succeed.

Future Potential

Despite the variety of looming challenges, the future looks bright for the digital age of healthcare.

“I think what you’re going to see is a convergence of telepresence and mobile devices,” Muntz said. There are already attachments that can be added to

phones that can enable a provider to better evaluate a patient without the burden of travel.

“I see a wonderful convergence of those technologies that will allow us to be treated where it’s convenient to be as opposed to where the providers happen to be located,” he added. That means faster interactions and accelerated timelines to diagnosis. “It’s the immediacy of telepresence that I think is one of the most exciting parts of it.”

As she peers into the future, Cheng envisions an exciting road ahead as well. “I think telehealth has the potential to do so much more,” she said.

Part of how we’re going to move forward is through the use of data fed into platforms. Lab data, activity trackers, and wireless stethoscopes are all examples of ways that providers could use additional information to make more nuanced diagnoses and expand the range of diagnoses that providers will be able to address.

“We’re at the very, very beginning of what telemedicine is capable of doing,” she added.

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