



Chronicling an Entry into Telehealth: Open Door Community Health Centers

Introduction

California's safety net of more than 800 community clinic and health center (CCHC) sites is a principal provider of primary care and specialty medical services for the state's large population of uninsured patients. More than one out of every three (37.4 percent) state residents under the age of 65 went without health insurance for all or part of the two-year period 2007-2008.¹ With the recent deep recession and rise in unemployment, these safety-net providers saw an increase of 10 to 50 percent in newly uninsured patients in 2009.² The pressure to provide services to more patients challenges the CCHCs to improve access, a problem heightened in many rural areas by a scarcity of providers.

One method being championed nationally for overcoming barriers to access is telehealth. Also called telemedicine, telehealth is the provision of health care, health information, and health education across a distance, using telecommunications technology and specially-adapted equipment.³ Telehealth can improve access to care by reducing costs and time of transportation for both patients and providers, improvement that is crucial where physician-to-patient ratios are inadequate, or where there are not enough specialists to meet a population's needs in both rural and urban settings.⁴ Telehealth has therefore become a key strategy component for improving health service delivery in medically underserved areas.⁵ With improved health service delivery, including that provided by telehealth, patients can receive care for acute

conditions locally, timely treatment for medical problems before they become critical, and better management of their chronic conditions.⁶ Further, by allowing a primary care physician to manage a condition, telehealth can reduce in-person visits to specialists, thereby decreasing patient travel time and costs.⁷ At the same time, use of telehealth can increase access to specialty care by reducing the amount of time that patients must wait to consult with a specialty provider.⁸

This issue brief highlights the entry into telehealth of the Open Door Community Health Centers (Open Door) based in Arcata, California, founded in 1971 to provide health services and preventive health education to residents of mostly rural Humboldt and Del Norte counties. The successful growth of their telehealth programs from 1998 to 2009 demonstrates the many ways that CCHCs can leverage this technology to address critical health care needs of the communities they serve.

Issues in Telehealth Adoption at Community Health Centers

While the use of telehealth can increase access to both primary and specialty care, its use has nonetheless not been universally embraced because of many structural, logistic, and financial barriers. Introducing and sustaining telehealth projects at CCHCs present particularly difficult challenges regarding implementation costs and payment/reimbursement. CCHCs operate with a complex mixture of funding from federal grants, Medicare, Medi-Cal, state- and county-funded programs for

How Telehealth Operates

Within telehealth, there are two main processes: real-time and store-and-forward. In real-time encounters, videoconferencing allows for an interactive clinical encounter, with a patient and clinical provider at either end of a live communications link. Many specialties are effectively using such real-time telehealth videoconferencing, including psychiatry,⁹ endocrinology,¹⁰ and orthopedics.¹¹ Store-and-forward encounters, on the other hand, involve the collection and electronic storage of clinical information or digital images captured in one location and forwarded elsewhere for interpretation and evaluation. Common examples of store-and-forward telehealth include remote X-ray reading by a radiologist and evaluation of digital pictures of the skin by a dermatologist. Together, the two components of telehealth allow health care providers to assess, diagnose, and treat patients without requiring the patient and the provider, or two or more providers (such as primary care and specialist), to be in the same location.

indigent care, and private insurance. Each funding source has unique requirements for eligibility and payment, creating numerous regulatory compliance issues.

As CCHCs consider changes to their scope of services and modalities—e.g., adding specialty services and implementing telehealth programs—the complexities of reimbursement from myriad sources stands as a considerable barrier. For example, since 1996 California has facilitated Medi-Cal program reimbursements to providers for telehealth visits by eliminating the requirement of face-to-face contact during a visit. However, this does nothing to address reimbursement for care to the uninsured, or to those insured by other payers that do not reimburse for telehealth.¹² Moreover, a CCHC considering implementation of an optional service under Medi-Cal to be provided through telehealth, such as speech therapy, must consider that optional services are often among the first program cuts made when the state encounters budget problems. In sum, without guaranteed reimbursement for telehealth visits, many of

the perennially financially precarious CCHCs believe they cannot take the economic risk of implementing telehealth.

Also, with their razor-thin operating margins, many CCHCs face significant funding challenges when investing in the equipment and training for the start-up of telehealth programs. Seeking grant funding for a telehealth program requires considerable time and energy on the part of clinic staff, and ties the clinics to external timelines. Additionally, space is very limited in most clinics, so few can provide dedicated exam rooms for videoconferencing equipment. Most clinics that do telehealth have to rely on dual-purpose rooms to house their equipment and telehealth consults.

Training clinical and administrative staff to use the technology can be time-consuming and disruptive. Also, as with other technology efforts, implementing telehealth programs requires a significant reworking of existing work flows and protocols. In particular for telehealth, coordinating equipment and providers so that they are available at the same time can be a significant challenge. There can also be significant challenges for clinics in ensuring that the appropriate information is available to the remote provider seeing a patient via telehealth. For clinics using paper charts, for example, staff supporting telehealth visits must frequently fax medical charts and other relevant patient information back and forth to ensure full preparation of the provider prior to the visit, and documentation for the patient's record following the visit.

CCHCs may also lack the information technology (IT) staff necessary to support the implementation and maintenance of telehealth. If implementation requires hiring new staff with specialized IT training—assuming that such personnel are available, which is not necessarily the case for rural clinics or for clinics that must compete with higher-paying employers—it also exacts another financial toll. In addition, in clinics that do have qualified

staff, those personnel are likely to have many competing priorities. With a limited number of staff to support IT functions, a clinic's first priority may need to be having that staff support more "basic" clinic operations for patient care.

Finally, even if a clinic can manage to implement a telehealth program with the aim of providing access to specialty care, it cannot do so unless it has the specialists who can provide that care. Recruiting and retaining specialists to work within a health center, particularly in rural areas, is a significant challenge, as salaries are typically well below those in private practice.¹³ Telehealth can allow a CCHC to contract with specialists, instead, to provide services to its patients during dedicated time slots. But this arrangement also has its challenges, as it requires that the CCHC ensure that these time slots are filled, so that it is not reimbursing specialists for unproductive time.

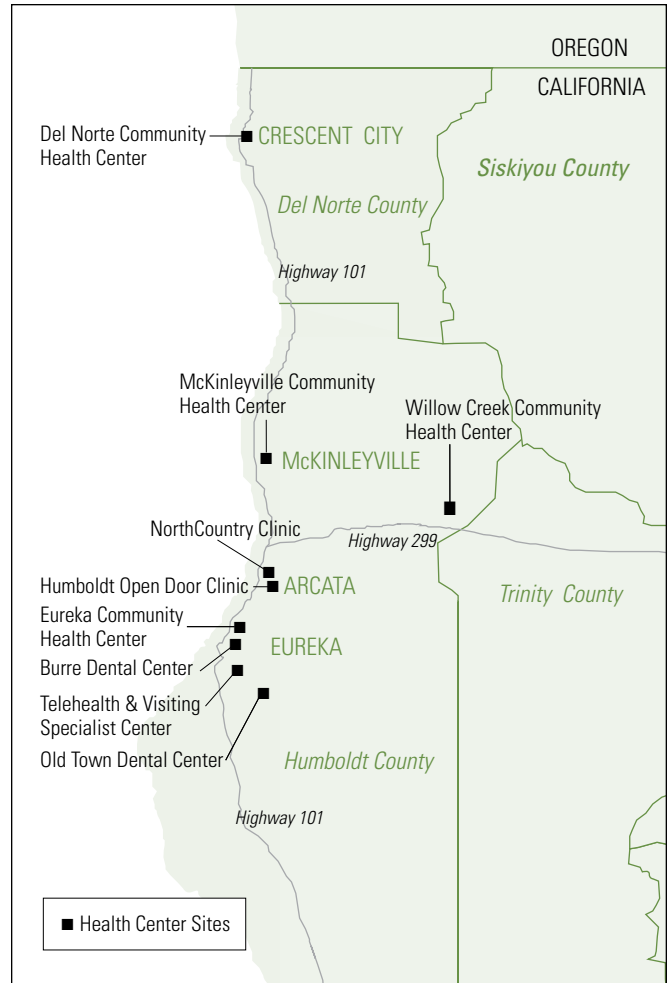
Open Door's Telehealth Experience

Open Door's Origins and Growth

Over the past 39 years, Open Door has grown from a single storefront site to nine clinics and one mobile dental unit employing 37 full-time equivalent (FTE) medical staff, nine dental FTEs and nine FTE behavioral health practitioners. Open Door's service area has expanded from Humboldt and Del Norte counties to portions of Trinity and Siskiyou counties, and now encompasses more than 6,200 square miles in the northwest corner of California. (See Figure 1 for Open Door's clinic locations.)

Open Door began in 1971 as a small, local clinic in the free clinic model, staffed largely by volunteers. In 1976, a group of providers left Open Door to start the NorthCountry Clinic, which provided services focused on women's health and grew to encompass clinic sites in the towns of Arcata and McKinleyville. By 1984, Open Door had expanded greatly, with a staff of employed service providers and a new clinic building in Arcata. Its patient load continued to increase, and by 1986 its

Figure 1: Open Door Community Health Centers Clinic Locations (December, 2009)



Source: Open Door Community Health Center

operations had outgrown its new clinic building. In 1990, Open Door opened another site in Crescent City and a year later a clinic in Eureka. These were followed in the 1990s by new clinic sites in Smith River, Orick, and McKinleyville, along with a dental office in Eureka. In 2000, Open Door and NorthCountry Clinics merged, combining their Arcata and McKinleyville locations. By the end of 2001, the combined clinics were providing 112,000 patient visits annually.¹⁴

Open Door received Federally Qualified Health Center (FQHC) status in 1999, making it eligible for such benefits as grants to support care to the uninsured, enhanced Medi-Cal reimbursement rates, and access to medical malpractice coverage under the Federal Tort

Claims Act. Despite its FQHC designation, however, Open Door—like many other rural CCHCs—faces difficulties with provider recruitment and retention and with access to specialty services, particularly to pediatricians and psychiatrists, for its patient population.

For example, in 2004, Open Door hired a psychiatrist to serve multiple clinic sites. The provider rotated among these several clinic locations, spending upwards of four hours per day driving between them. While this was a boon to patients, it took its toll on the provider, and after about a year, citing the stress and strain of this practice dynamic, the psychiatrist left Open Door to take a position that did not have such a punishing travel regimen. In the absence of such multiple-site, in-person services by specialists, however, it is the patients who have to spend inordinate amounts of time and energy traveling to receive care, if the care is available at all. A survey conducted by Open Door in 2005 found that its patients traveled an average of 558 miles and 12 hours round trip to see a specialist in person. It was in this context that Open Door determined that through telehealth it might at least partially address the related problems of patient access and provider availability.

The Beginnings of Open Door's Telehealth Program

Open Door was introduced to telehealth in the late 1990s through the California Telemedicine and eHealth Center (CTEC) and the University of California, Davis (UC Davis) Telehealth Program (now called the UC Davis Center for Telehealth and Technology). Open Door's chief executive officer, Herrmann Spetzler, was an original board member of CTEC when it was established in 1996. Open Door's clinical participation in telehealth began through a program sponsored by Blue Cross of California, which donated telehealth equipment and provided training to many rural health care providers in the state throughout the 1990s and early 2000s.

In 1999, Open Door began using simple equipment—a large computer screen, a basic video camera, and a keyboard—to connect patients at its Eureka, Arcata, and Crescent City clinics to a variety of specialists at locations ranging from UC Davis to Cedars-Sinai Medical Center in Los Angeles. Psychiatry and dermatology were the two most frequently accessed specialty services. At the time, however, Open Door found that dermatology consultations with live video was not a very effective dynamic, in large part due to the limited bandwidth then available in Humboldt and Del Norte counties to support high quality video images. Over the last ten years, connectivity and bandwidth have improved significantly across Open Door's service area.

Also in 1999, Open Door began to use telehealth to connect with a group of psychiatrists in Santa Rosa, some 200 miles to the south. This program was initially supported by grants from Blue Cross of California. As with many similar efforts to initiate telehealth programs at that time, however, the lack of reimbursement for telehealth visits (from both public and private payers) limited the program's success. Soon after the grants supporting the Santa Rosa providers' telehealth visits ended, the providers stopped seeing Open Door's patients via telehealth. This again highlights a general problem in supporting telehealth: Although Medi-Cal began reimbursing for telehealth in 1996, the limited number of specialty providers across California accepting Medi-Cal patients has continued to be a barrier to telehealth program expansion by clinics such as Open Door.

Development of the Telehealth and Visiting Specialist Center

By the end of 2005, Open Door was conducting more than 130,000 visits annually across eight clinical sites.¹⁵ Because of the growth in its volume and the related increased need for specialty services, Open Door began evaluating options for recruiting additional specialists and ensuring that their time would be adequately reimbursed.

In the spring of 2006, Open Door embarked on a new telehealth chapter, opening the Telehealth and Visiting Specialist Center (TVSC). The TVSC is located in Eureka, in a building that Open Door bought and renovated with the help of an economic development grant from the Headwaters Foundation. Each of the four telehealth exam rooms at the TVSC is outfitted with a Polycom® VSX 5000 videoconferencing unit and a desktop computer for providers which, combined with a video bridge, allows for real-time video connections with multiple locations within and beyond the Open Door clinic sites.

The primary rationale for developing the TVSC was to centralize many costs related to the telehealth programs, including connectivity, training, support staff, and equipment. In conjunction with the building of the TVSC, Open Door applied to the federal Health Resources and Services Administration (HRSA), which funds and administers FQHCs, to expand the scope of its services. Prior approval by HRSA of additional services or a new service location is required in order for an FQHC to request a related adjustment to its state Medicaid reimbursement rate.¹⁶ The approved new scope of services allowed Open Door to receive a reimbursement rate that included the higher costs of the new telehealth component.

Open Door now contracts with a number of specialty care providers who offer both in-person and telehealth care at the TVSC, including cardiology, endocrinology, orthopedics, and pulmonology. These providers come into the TVSC to see patients for scheduled visits. Open Door also directly employs its own psychiatrist and psychologist to provide both in-person and telehealth consultations. For any given specialist, time at the TVSC consists of either an in-person visit in an exam room, or a telehealth visit connected to a remote Open Door site from one of the TVSC's specially-equipped telehealth exam rooms.

While a number of health centers across the state have taken part in telehealth programs, few have gone as far as Open Door. The TVSC has allowed Open Door to move beyond connecting to specialists outside of its organization. Open Door now has contracts to provide specialty services via telehealth to other organizations across the state, serving as a “hub” (location of consulting provider) as well as a “spoke” (location of referring provider and/or patient) site. The TVSC, located in the northwestern corner of California, has provided specialist visits via telehealth to clinics in 14 counties, as far away as Imperial County in the southeastern corner of the state. (See Figure 2 for the relationships between the TVSC and Open Door-affiliated and non-affiliated health care clinics.)

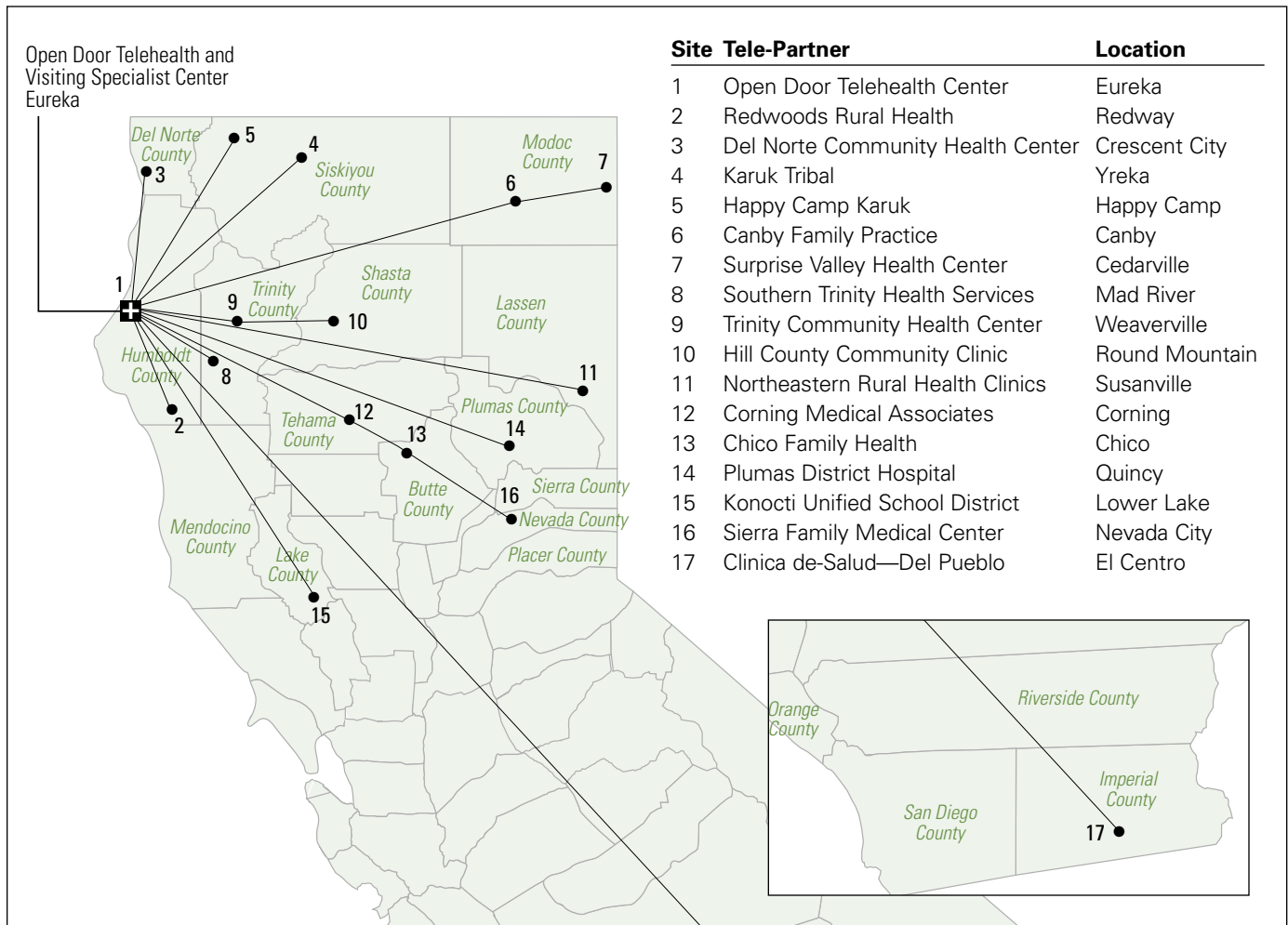
By 2009, Open Door was conducting nearly 1,000 telehealth visits annually. (See Table 1 for details of Open Door's total 2009 telehealth volume by clinical specialty and modality, including both store-and-forward and real-time video encounters.)

TVSC telehealth equipment has even allowed Open Door's medical director to remotely provide clinical leadership services on an interim basis to a health center in the next county with a medical director vacancy. Open Door's medical director was able to conduct weekly medical staff meetings with the other clinic's providers, supervise quality assurance peer reviews, and provide general supervision.

Successful Telehealth Means Jobs

An unexpected benefit of Open Door's development of telehealth programs has been the economic boost it has given to the local community. Open Door estimates that introduction of the TVSC has created 24 new jobs. The majority of these are salaried jobs with employee benefits that are typical of support staff in a medical practice. This consequence is particularly significant in a rural area like Humboldt County where unemployment reached 11.6 percent in late 2009.¹⁸

Figure 2: Relationship Between TVSC and Open Door-Affiliated and Non-Affiliated Clinics¹⁷



Source: Open Door Community Health Center
 Telehealth Partner list as of 10/25/2009. Map compiled by Dimitra Zalivaris-Chase & Brian Huggett, 10/29/2009.

Benefits from Open Door’s Telehealth Programs

Open Door and its patients have realized many benefits from its telehealth programs. For example, in addition to providing clinical consultations, Open Door utilizes the TVSC to provide diabetes management and education within its organization, to both patients and its own providers, at remote clinic sites. These individual and group visits for diabetic patients have been well-received, allowing patients to avoid long travel that can be not only uncomfortable and inconvenient but also counterproductive to their health management. Open Door has also seen an immediate positive impact on health outcomes as a result of its telehealth diabetes management and education program. Preliminary data from a small sample (65) of patients seen via the TVSC in the early

stages of the program showed improvements in the frequency of low-density lipoprotein testing and screening for diabetic retinopathy, as well as an average two-point decrease (improvement) in hemoglobin A1c levels.

Open Door’s telehealth programs have also been a boon to local specialists, who are able to expand their practices by seeing distant patients via the TVSC. Rather than having to create the infrastructure for telehealth visits within their individual practices or traveling to remote parts of geographically huge Del Norte and Humboldt counties, these specialists are able, through the TVSC, to see patients much more cost-effectively. Open Door reimburses the specialists for their time at the TVSC regardless of the number

of patients they see. This arrangement benefits both the local specialists and Open Door. In addition, Open Door works with community specialists to address common goals. For example, Open Door and a local pulmonology group identified the need for the equivalent of an additional half-time pulmonologist in their service area to serve patients in remote areas. Rather than hiring a pulmonologist to practice part-time at a remote site, the TVSC contracted with the pulmonology group to bring one specialist to the TVSC on a part-time basis to provide both in-person and telehealth visits. By buying up a percentage of the time of an outside specialist who could provide services through the TVSC, Open Door was able to provide the level of service needed by its patients without having to take on the cost of a full-time provider.

Telehealth has also allowed Open Door to more efficiently deliver primary care services. In one instance, Open Door fully substituted telehealth for a clinic that provided in-person visits. In 2000, Open Door opened the Smith River Clinic in the small town of Smith River located 90 miles, and more than a two-hour drive, north of the clinic’s main site in Arcata. Providers were seeing an average of only four to six patients per day at the Smith River clinic, but it was viewed by the community as an integral local health resource. Over time, the continuing low number of patient visits made it increasingly hard for Open Door to maintain provider staffing, and in 2007 operations were reduced to one day of service per week. After extensive discussions with the community and a local elementary school (whose pupils constituted a significant part of the clinic’s patient population), an alternative was developed: A telehealth-based clinic would be offered for the school during the day and for the wider Smith River community at other times. Now called the Blooming Lily Telemedicine Clinic, this program allows Smith River children to remain on school grounds for their health care visits rather than having their parents transport them to a medical appointment in Crescent City, 20 miles away, or in Arcata, 90 miles away. Staffed by a full-time licensed vocational nurse, Blooming

Table 1: 2009 Telehealth Clinical Visit Volume at Open Door*

By Modality	
<i>As Hub (location of consulting provider)</i>	
Retinal Reading Consult	165
Real-Time Interactive	473
Total Hub Visits	638
<i>As Spoke (location of referring provider and/or patient)</i>	
Real Time Interactive	205
Store-and-Forward Retinal Scan	128
Store-and-Forward Dermatology	24
Total Spoke Visits	357
Total TVSC Visits	995

By Specialty	
Dermatology	30
Psychiatry	132
Diabetes Education	95
Endocrinology	61
Pediatrics	158
Pediatrics Behavioral Health	40
Pediatrics Weight Management	11
Cardiology	65
Ophthalmology	287
Orthopedics	11
Adult Behavioral Health	63
Pulmonology	12
Family Practice	24
Geriatric Support Group	5
Rheumatology	1
Total TVSC Visits	995

* Note: Retinal Reading Scans are counted as both store-and-forward spoke visits and store-and-forward hub consultations; live consultations between Open Door sites are counted as both hub consultations and spoke visits.

Source: Frank Anderson, Telehealth Development Director, Open Door

Lily is connected via videoconferencing to physicians at Open Door's Del Norte Clinic for remote consultations.

Finally, Open Door has developed its telehealth capacity to go beyond the provision of clinical services. The TVSC has become a remote classroom for Open Door; it uses the TVSC to provide a six-week training course in Spanish-language interpretation for its health care workers at its remote sites. Open Door has also utilized the telehealth equipment to conduct medical staff meetings across clinic sites. These remote meetings have reduced

Not All Telehealth Experiments Have Been Successful

Not all of Open Door's telehealth efforts have met with success. A program designed to implement telehealth visits for obstetricians at Mad River Community Hospital suffered a quick demise. Obstetricians within Open Door's NorthCountry Clinic are frequently called away from office hours to attend to deliveries at Mad River Community Hospital, thus forcing patients scheduled for an office visit to be seen by another provider. Open Door implemented a provider videoconferencing workstation at the Mad River Community Hospital to allow providers, who had left the clinic for the hospital, to remotely see their patients who showed up to see them at the clinic. For Open Door's administration, this arrangement was viewed as an opportunity to minimize rescheduling of office visit patients.

It turned out, however, that the administrators should have more actively involved the providers themselves in considering this telehealth program. In this case, the obstetricians were using their downtime at the hospital for catching up with paperwork and monitoring the expectant patients. Not only did they feel that they were already using this time productively, but also that there was no need for telehealth remote consultations back to the clinic since other providers covered for them and their in-clinic patients were receiving good quality care. As a result of the obstetricians' resistance to using this telehealth arrangement, it was discontinued shortly after its inception.

the instances of clinical staff at nine remote sites missing a minimum of a half-day in round-trip travel to attend these regular meetings. In addition, Open Door's medical director has used the telehealth equipment to hold frequent meetings with clinic managers as they rolled out a new electronic health records system across Open Door sites.

Lessons Learned

Integrate Telehealth as a Set of Tools, Not as a Separate Program

Initially, Open Door envisioned its telehealth programs as a separate undertaking, rather than as a set of tools to be used by providers for patient care. Based on this notion, Open Door first designed a program so that providers would see telehealth patients in four-hour shifts, under the assumption that providers would want to remain seated and interacting with patients via videoconference over an extended, uninterrupted period of time. It turned out, however, that providers were not comfortable with only seeing patients via telehealth over extended periods. The providers' dissatisfaction with this telehealth model led Open Door to substitute a hybrid model in which approximately 80 percent of the encounters take place in-person, and 20 percent via telehealth. This has allowed providers to serve a broad spectrum of patients but without lengthy prescheduled blocks of telehealth-only patient encounters. Open Door now views the telehealth technologies as part of its suite of delivery services and not as a separate program of care.

Telehealth has also allowed some long-time Open Door providers to expand their practice domains. For example, one of Open Door's employed pediatricians, who has been practicing at Open Door for 35 years, now spends approximately 75 percent of his time seeing patients in his office. The other 25 percent is spent in a new practice area: conducting behavioral modification therapy with children through telehealth consults. The result has been higher practice satisfaction for the provider and new services for patients.

Remember the Patient

By definition, the telehealth encounter is less personal than one in which the provider and patient are in the same physical space. Open Door has recognized that patients need to view telehealth as an expansion of the in-person clinical visit, not a replacement of it. Consequently, Open Door tries to introduce telehealth in ways that support in-person encounters. For example, when Open Door introduced a new pediatrician to the Del Norte Clinic in Crescent City, it used telehealth to make the transition a gradual one for the patients. Before the new pediatrician was hired, the senior pediatrician at Open Door would travel from Arcata to Del Norte every two weeks to see patients. In order to slowly transition the patients from the senior pediatrician to the new full-time pediatrician hired for the Del Norte Clinic, the two physicians jointly conducted visits with established patients, using telehealth: The new pediatrician would be present in the Del Norte exam room with the patient, while the senior pediatrician consulted remotely, introducing the patient to the new provider. These telehealth visits facilitated a smoother transition of patients from one provider to the next, while eliminating the need for the senior provider to travel to the remote site during the transition period.

Keep the Technology in Balance

While telehealth can involve high-tech equipment costing tens of thousands of dollars, it does not need to: Specialty consultations often can be implemented using basic computers, an internet connection, and a video camera or encrypted email. Many tele-dermatology consultations, for example, are completed via an exchange of encrypted emails between a referring provider and a dermatologist, with attached pictures for review. In general, the costs of telehealth increase with the need for more interactive services and higher quality images. Initially, Open Door's donated telehealth equipment from Blue Cross came with a lot of "functionality," meaning the capacity to perform many types of technical operations. But Open Door found that most of the technology was far more advanced

than the providers needed. Most of the high-end technology (such as an endoscope) was used during initial testing and training but never in practice.

Open Door learned from this early experience to implement initially only a basic level of technology and to let providers help build the system based on what they determine they need and want. This strategy has not only helped Open Door save money on unnecessary equipment and applications, it has also allowed the providers to be involved in developing, and thereby to become invested in, the program.

Even with such a policy of restraint, however, clinics that enter the telehealth world may be confronted with external pressures to expand their technology. Clinics that commit to implementing telehealth programs become dependent on their telehealth partners and must respond to changes in their partners' technology. For example, Open Door relies on UC Davis for consultations and reports, but when Davis upgraded its televideo systems, the two systems often failed to connect due to software or hardware incompatibilities. This has forced Open Door into some unexpected costs for upgrades, and underscores the importance of having ongoing consultations with telehealth partners concerning possible system changes.

Telehealth Provides the Bonus of Extra Training

An unexpected benefit from the development of the telehealth programs at Open Door has been the increased training and educational experiences primary care providers (PCP) obtain through their referrals to specialists, with whom the PCPs are an integral part of an active consultative process. For example, Open Door PCPs have gained considerable dermatology expertise through consultations with UC Davis specialists, which has increased the PCPs' ability and willingness to perform biopsies for moles and rashes. In some cases, this reduces the need to refer out patients with minor dermatology conditions, as they can be effectively treated by Open Door's own PCPs.

Coordination Is a Major Challenge

One of the biggest lessons Open Door learned during the process of implementing telehealth was that a substantial level of personnel support is required to operate the programs. Significant coordination is needed on both sides of a telehealth visit to ensure that all the necessary information is available to the specialist, that the technology is set up and functional, and that the timing of patient and provider is synchronized. Open Door found that, at a minimum, several phone calls between the two sites, testing of equipment, a patient work-up, and case management all have to happen before a telehealth visit can begin. The telehealth coordinator at the TVSC reports spending significant time calling patients to confirm appointments and to ensure that all telehealth visit slots are filled; this is particularly important because they are often harder to backfill than in-person visits. This coordination requires dedicated staff on both Open Door and specialist sides of the connection. The need for this level of coordination and staff commitment was the impetus for Open Door to create the TVSC as a central place where a consolidated level of support, equipment, and training is available.

Lessons Can Be Learned from Other Programs

Most telehealth products and programs cannot be universally applied to the CCHC setting; Each CCHC is different with regard to patient populations, payer mix, funding and reporting requirements, and financial and personnel limitations.¹⁹ Open Door discovered that it had to develop and operate its programs through trial and error. Clinics considering implementing a telehealth program may be able to reduce errors by visiting existing community clinic-based telehealth sites. Seeing live telehealth demonstrations in other community health settings and talking with those who have implemented the programs in similar environments may help them avoid some pitfalls and challenges that Open Door faced in its relatively early, and therefore more isolated, program development.

Conclusion: Future Telehealth Directions for Open Door

Open Door continues to look for opportunities to expand its telehealth program based on the needs of its patient population. Open Door is about to embark on an effort to provide pulmonary rehabilitation via telehealth for its patients with chronic respiratory diseases, such as chronic obstructive pulmonary disease and emphysema, who now must receive this care at Mad River Community Hospital in Arcata. Given their conditions, frequent travel to conduct this therapy in person is often a great burden. Under the new program, the patients instead will be able to present at their local clinic, such as Del Norte in Crescent City, to run through an evaluation during a live video visit using equipment connected to a pulmonologist and pulmonary rehabilitation coordinator at the TVSC. The patient's regimen will then consist of one to two telehealth visits a week for education, self-management training, and monitoring of moderate-paced exercise for a period of eight weeks.

Open Door is also completing implementation of electronic health records (EHR) at all of its clinical and administrative sites. When fully implemented, EHR will eliminate the need to fax paper charts between sites before and after a telehealth visit. Open Door also envisions rolling out technology to support home health care, with tools such as remote monitoring devices that electronically send data to the clinic. As Open Door moves forward, it will continue to use telehealth as a tool to improve access to quality health care services for its patients.

ABOUT THE AUTHORS

Julie M. Hook, M.A., M.P.H., and Michael P. Rodriguez, M.A., are researchers and consultants at JSI Research and Training Institute (JSI). JSI is a not-for-profit, public and community health research, evaluation, and consulting organization dedicated to improving the health of individuals and communities throughout the world. Ms. Hook leads the domestic health information technology research efforts at JSI, while Mr. Rodriguez manages health information technology strategic planning, training, evaluation, and survey work in both the international and domestic realms.

ABOUT THE FOUNDATION

The **California HealthCare Foundation** is an independent philanthropy committed to improving the way health care is delivered and financed in California. By promoting innovations in care and broader access to information, our goal is to ensure that all Californians can get the care they need, when they need it, at a price they can afford. For more information visit www.chcf.org.

ENDNOTES

1. Families USA. *The Uninsured: A Closer Look—Californians Without Health Insurance Fact Sheet*. March 2009 (www.familiesusa.org/assets/pdfs/americans-at-risk/california.pdf).
2. California Primary Care Association. Winter 2009 Newsletter (www.cPCA.org/about/newsletter/Fall2009.pdf).
3. Definition adapted from the Center for Telehealth and e-Law (www.telehealthlawcenter.org/content/?page=18).
4. Johnston B. and N.A. Solomon. *Telemedicine in California: Progress, Challenges, and Opportunities*. California HealthCare Foundation, 2008 (www.chcf.org/documents/policy/TelemedicineInCA.pdf).
5. Dixon, B.E., J.M. Hook, and J.J. McGowan. December 2008. "Using Telehealth to Improve Quality and Safety: Findings from the AHRQ Portfolio." Agency for Healthcare Research and Quality. Rockville, MD. Prepared by the AHRQ National Resource Center for Health IT. *AHRQ Publication* 09-0012-EF.
6. Bodenheimer, T.M. and C. Shafiri. *Helping Patients Manage Their Chronic Conditions*. California HealthCare Foundation, 2005 (www.chcf.org/topics/chronicdisease/index.cfm?itemID=111768).
7. Whited, J.D., R.P. Hall, M.E. Foy, et al. 2002. "Teledermatology's Impact on Time to Intervention among Referrals to a Dermatology Consult Service." *Telemed. J. E Health* 8; 313-21; Wootton, R., S.E. Bloomer, R. Corbett, et al. 2000. "Multicentre Randomized Control Trial Comparing Real Time Teledermatology with Conventional Outpatient Dermatological Care: Societal Cost-Benefit Analysis." *BMJ* 320; 1252-6; Patterson, V., J. Humphreys, and R. Chua. 2004. "Email Triage of New Neurological Outpatient Referrals from General Practice." *J. Neurol. Neurosurg. Psychiatry* 75; 617-20; Pak, H.S., M. Welch, and R. Poropatich. 1999. "Web-Based Teledermatology Consult System: Preliminary Results from the First 100 Cases." *Stud. Health Technol. Inform.* 64; 179-84.
8. Whited, J.D., R.P. Hall, M.E. Foy, et al. *supra*; Kedar, I., J.L. Ternullo, C.E. Weinrib, K.M. Kelleher, H. Brandling-Bennett, and J.C. Kvedar. 2003. "Internet Based Consultations to Transfer Knowledge for Patients Requiring Specialized Care: Retrospective Case Review." *BMJ* 326; 696-9; Krupinski, E., G. Barker, G. Rodriguez, et al. 2002. "Telemedicine Versus In-Person Dermatology Referrals: An Analysis of Case Complexity." *Telemed. J. E Health* 8; 143-7.
9. O'Reilly, R., J. Bishop, K. Maddox, L. Hutchinson, M. Fisman, and J. Takhar. June 2007. "Is Telepsychiatry Equivalent to Face-to-Face Psychiatry? Results from a Randomized Controlled Equivalence Trial." *Psychiatr. Serv.* 58 (6); 836-43; Ruskin, P.E., M. Silver-Aylaian, M.A. Kling, et al. August 2004. "Treatment Outcomes in Depression: Comparison of Remote Treatment through Telepsychiatry to In-Person Treatment." *Am. J. Psychiatry* 161 (8); 1471-6.
10. Marcin, J.P., T.S. Nesbitt, S.L. Cole, R.M. Knuttel, D.M. Hilty, P.T. Prescott, and M.M. Daschbach. "Changes in Diagnosis, Treatment, and Clinical Improvement among Patients Receiving Telemedicine Consultations." February 2005. *Telemed J. E Health* 11 (1); 36-43.
11. Vuolio, S., I. Winblad I, A. Ohinmaa, et al. 2003. "Videoconferencing for Orthopedic Outpatients: One Year Follow-Up." *J. Telemed Telecare* 9 (1); 8-11.
12. Whitten, P. and L. Buis. February 2007. "Private Payer Reimbursement for Telemedicine Services in the United States." *Telemed J. E Health* 13 (1); 15-23.
13. Institute of Medicine. *Quality Through Collaboration: The Future of Rural Healthcare*. Washington DC: The National Academies Press, 2005.
14. State of California, Office of Statewide Health Planning and Development, *2001 Final Database of Primary Care Clinics*.
15. State of California, Office of Statewide Health Planning and Development, *2005 Final Database of Primary Care Clinics*.
16. United States Department of Health and Human Services, HRSA, Bureau of Primary Health Care, Policy Information Notice 2008-01. "Defining Scope of Project and Policy for Requesting Changes." Issued December 31, 2007. Revised January 13, 2009.
17. Developed by Brian Huggett, graduate student in the Department of Forestry & Wildland Resources, Humboldt State University.
18. State of California. Employment Development Department. Labor Market Information Division. *Monthly Labor Force Data for Cities and Census Designated Places—November 2009* (www.calmis.ca.gov/file/lfmonth/humbosub.xls).
19. Hook, J.M., E. Grant, and A. Samarath. *Health Information Technology and Health Information Exchange Implementation in Rural and Underserved Areas: Findings from the AHRQ Portfolio*. Prepared by the AHRQ National Resource Center for Health IT (in press).