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Health Care for a High-Tech World

The Potential for Telehealth in Colorado

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On the cover: Dr. Jeff Wagner (on the computer monitor) talks to hospital staff and a patient during a demonstration of a neurological telehealth consultation.

Photo courtesy HealthONE CO-DOC Telemedicine Network

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Health Care for a High-Tech World

The Potential for Telehealth in Colorado

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Introduction

Changes in health care are on the fast track.

More Coloradans are gaining health insurance coverage due to state and federal health reforms. Coloradans, including tech-savvy older adults, are seeking care that is close to home and easy to access. Providers struggling to keep up with demand want to deliver high-quality primary and specialty care to their patients efficiently. And public and private health insurers are targeting costly hospitalizations and unnecessary trips to the emergency department to rein in spending.

Telehealth is one tool that can help meet these changes. And its use is picking up speed in Colorado and the rest of the nation.

The U.S. market for telehealth is projected to increase eightfold, with revenues climbing from \$230 million in 2013 to \$1.9 billion in 2018, according to IHS, a business research firm. Over that time, the number of patients being monitored through the technology is expected to balloon to more than 3.2 million, IHS predicts.¹

In Colorado, telehealth systems are connecting specialists on the Front Range with health care providers and patients across Colorado and neighboring states. Nearly 200 hospitals, clinics and behavioral health centers in underserved and rural areas have received financial support to connect securely with Internet broadband through the Colorado Telehealth Network (CTN)

since its launch in 2008. The state is poised to double this number by 2018, and efforts are underway to expand telehealth offerings in Medicaid.

Meanwhile, recognition of telehealth's potential is growing:

- The nation's largest association of physicians, the American Medical Association, recently established guiding principles for ensuring coverage and payment for telehealth.²
- One of the nation's leading telecommunications companies recently announced it is jumping into this emerging market. Verizon Wireless has introduced a new product called "Virtual Visits," which will connect providers and patients through their phones, tablets or laptops.
- The Federation of State Medical Boards created



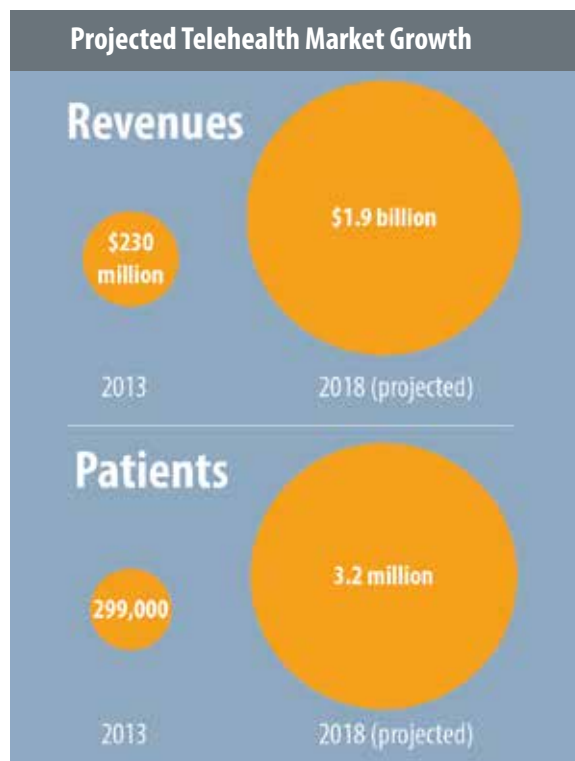
Photo by HealthONE

Dr. Jane Nydam, a pediatric cardiologist, uses a telemedicine machine to consult with technician Paul Cook at Swedish Medical Center about a pediatric echocardiogram.

policy guidelines for the safe use of telehealth technologies, providing a roadmap for state boards interested in passing similar policies.³

- Colorado’s State Innovation Model proposes to integrate physical and behavioral health care and includes adding 300 telehealth sites in rural and underserved communities across the state.

Research on telehealth suggests it can provide care that is the same quality, or even higher quality than treatment delivered in a doctor’s office. Yet questions and barriers remain. Telehealth may increase overall use of medical services, driving up total health care costs. Technology, although becoming more nimble, may be prohibitively expensive for some providers. Broadband connectivity — a linchpin for telehealth — is still spotty in some rural communities. And some patients still prefer face-to-face communication with their health providers.



Source: IHS



Telehealth 101

Telehealth harnesses information technology to connect doctors and health care providers with patients in different — sometimes far distant — locations. Technologies to deliver telehealth include computers and tablets, smart phones, the Internet (particularly broadband service), videoconferencing and wireless communication.

Three forms of telehealth are relatively common today:

- Video consultations via the Internet that let patients visit virtually with their provider or that link providers to discuss patient care.
- Transmission of medical information such as X-rays or EKGs between health care providers or between patients and their providers. This is sometimes referred to as “store-and-forward.”
- Remote observation of patient vital signs, such as blood pressure, heart functions and blood sugar levels, using mobile equipment.

These services and others have been combined into a number of telehealth programs, including emergency specialty consultation services

available around the clock, tele-intensive care units (ICUs) and at-home monitoring after a patient has had surgery.

Through telehealth, health care providers can communicate with patients and treat them even if they live far from the clinic, or are unable to make the trip. It also may simply be more convenient for a patient to have a virtual visit instead of meeting face-to-face with a provider.

All of this is accomplished over secure networks, so that health information is seen only by patients and their providers. Some health care systems, such as HealthONE, have created virtual private networks (VPNs) for their telehealth services. VPNs allow geographically separated providers to work on a single, secure network, sharing patient information such as radiology images and clinical records. Cloud-based telehealth platforms send encrypted transmissions and create secure virtual clinical spaces where patients, providers and other important participants such as caregivers, family members or translators can communicate simultaneously.

DEFINITIONS

Telehealth and Telemedicine: A Difference?⁴

While there are no standard definitions for either term, organizations and governing bodies have identified a few general concepts:

Telemedicine typically refers to the delivery of clinical care services between different locations via an electronic exchange of medical information.

Telehealth often refers to a broader scope of remote health care. In addition to clinical care, it can include patient and professional health-

related education, public health and health administration. We are focusing on this wider definition in this brief.

Colorado law defines telemedicine as an interactive communication between providers and patients, using technology such as video consultations. Telehealth services, such as “store-and-forward” transmission of test results between providers, and some remote observations, do not fall under the state’s definition.



Increasing Access, Lowering Costs, Improving Quality

The Promise of Telehealth

Telehealth is viewed by many as an increasingly useful tool in building a more efficient and cost-effective health care system that meets the needs of consumers, particularly rural residents with limited access to physicians or specialists.

The scientific literature suggests that telehealth can increase patient access to high-quality care, but current research is mixed on telehealth's cost-saving potential.

Here is a summary of current findings:

Access

Studies have found telehealth increases access to primary and specialty care providers. Telehealth technology has been shown to reduce waiting times for certain specialty services.^{5,6} Patients who connect with specialists and other providers in a primary care provider's office — or in their own homes — save time and money by eliminating the need to travel.

Many studies also find telehealth patients are satisfied with the care they receive. However, these findings may be influenced by these patients' preferences for telehealth.^{7,8}

A number of areas of Colorado — particularly remote rural regions — face significant challenges in providing an adequate primary care workforce for their residents, according to a Colorado Health Institute report released in early 2014.⁹ The state's aging population, coupled with a growing number of Coloradans gaining health insurance as part of the Affordable Care Act (ACA), may widen this gap

DEFINITION

Tele-ICU

Physicians who specialize in caring for patients in urgent need of medical treatment, so-called intensivists, are often scarce at smaller hospitals. Tele-ICU programs allow intensivists at major hospitals to monitor patients in ICUs at distant hospitals.

The physicians can speak directly with patients through video connections, monitor a patient's vital signs and prescribe medications. Highly trained nurses at each remote site, in turn, watch over patients in the ICU and alert the intensivist to any problems.

between supply and demand.

Telehealth is one way to extend the reach of Colorado's existing health care workforce without having more physicians — or even one physician — practicing in a rural community. Rural patients can also tap into telehealth programs to connect with specialists in other areas of the state.

Quality

Studies suggest health outcomes among telehealth patients are largely similar to those in traditional delivery systems. A meta-analysis

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COLORADO STORIES

Telehealth in Action

Brad Cochennet began having stroke symptoms during a late-summer conference in Vail in 2011. He went to Vail Medical Center, where doctors put him in front of a piece of equipment he already knew well.

Just two weeks earlier, Cochennet, CEO of Pagosa Springs Medical Center, had played host to doctors from HealthONE's CO-DOC telemedicine program, who wanted to install a telemedicine system at his hospital. Through a virtual audio and visual connection, doctors at Denver's Swedish Medical Center can quickly diagnose strokes in patients all across Colorado. The telemedicine system uses cloud-based software and a secure internet connection to allow a Denver-based neurosurgeon to look at the patient's CT scans.

On that September day in 2011, Cochennet found himself looking at CO-DOC's telemedicine system in Vail. A doctor at Swedish diagnosed his stroke, and Cochennet recovered.

"To be able to offer this caliber of care in a small town is really exceptional."

Brad Cochennet, telehealth patient and CEO of Pagosa Springs Medical Center

Not surprisingly, he's enthusiastic about the CO-DOC system's success at Pagosa Springs Medical Center. He estimates it has saved nearly 20 people the expense (and family inconvenience) of a helicopter evacuation to Denver for a stroke

diagnosis. Another four or five times, Pagosa staff have administered the clot-busting drug alteplase, or t-PA, under the supervision of a neurologist at Swedish. Pagosa does not have a neurologist on staff full-time, and t-PA has to be given quickly to work well.

"To be able to offer this caliber of care in a small town is really exceptional," Cochennet said.



Photo by HealthONE

Dr. Jeff Wagner, a neurologist, assesses a patient through the CO-DOC interface.

Although some patients find telehealth to be helpful, many people are still apprehensive about using it, especially for first-time visits. Just over half (56 percent) of U.S. adults surveyed in 2012 were willing to use video conferencing for a sick visit. However, patients seem to prefer telehealth for follow-up care, with 67 percent willing to video conference for follow-up visits.¹⁰

The age of the patient can play a role. Telehealth may meet the expectations of "digital natives" – mostly younger consumers who have been brought up with computers, tablets and smart phones. They may be more amenable to using telemedicine than older "digital immigrants" who were introduced to technology later in life.



Photo by Joe Hanel/CHI

Dorothy Tighe checks her blood pressure during a telehealth checkup at The Gardens at St. Elizabeth in Denver.

But don't tell that to Dorothy Tighe. The morning of her 78th birthday, she spent a few minutes at her weekly appointment with a telehealth terminal at The Gardens at St. Elizabeth, a Centura Health senior community in Denver's Highlands neighborhood.

About 60 residents of The Gardens at St. Elizabeth participate in the telehealth program. They visit a fourth-floor room with a view south toward downtown Denver and a line of touch-screen monitors set up on a table. After logging in with her personal identification number, the computer asks Tighe how she feels. She answered "good," but if she had chosen one of the other answers, the computer would have followed up with a series of prompting questions to zero in on the problem.

"This program has been really wonderful," Tighe said. "I think it's really saved a lot of people."

Including her.

During her first visit, she wasn't feeling good, but not

so bad that she would have gone to see the doctor. But her answers to the questions on the telehealth terminal, plus her blood pressure reading, prompted intervention from the on-site nurse, who thought she might be having a heart attack. It turned out to be a stomach ailment, but without the telehealth red flag, she thinks she would have let the problem fester.

"For me, it was really a godsend. Somebody else besides yourself is saying, 'Do something,'" Tighe said.

That was more than a year ago. Now, Tighe looks forward to the visits as confirmation that her blood pressure is under control and that her regimen of walks around the track across the street at North High School is keeping her in good health.

Karen Wold, the on-site nurse at the telehealth clinic, makes the rounds to several other Centura telehealth sites, keeping tabs on 124 patients. She estimates Centura's program saves an average of four emergency

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COLORADO STORIES

Telehealth in Action

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department visits every week by helping patients catch problems early.

However, telehealth isn't the right prescription in every situation. Cochennet said the Pagosa hospital has experimented with telehealth for cardiology.

"Frankly, it hasn't worked. There's got to be a strong interest by the doctor on the other end to make it work," Cochennet said.

Still, Cochennet is committed to CO-DOC. He has seen its usefulness, both as a hospital executive and a patient. But he hopes he won't be quite as personally invested in new applications of telehealth.

"I've already told them, as we develop cardiology, I'm not going to have a heart attack for their benefit," Cochennet said.



Photo by Joe Hanel/CHI

Dorothy Tighe answers questions about how she is feeling on the telehealth terminal during a regular appointment on her 78th birthday.

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of 18 randomized controlled trials (RCTs) of real-time video telehealth programs found that health outcomes in 14 of the studies were equal to in-person visits. A psychology RCT was found to be less effective, while nursing and cardiology were more so. No studies found patient safety had been compromised.¹¹ Several studies have shown that tele-ICUs reduce ICU and hospital mortality rates, compared with standard care, and shorten the average length of stay in the ICU.¹²

Improved coordination and communication between providers can reduce duplicative and unnecessary tests. Specialists such as cardiologists or surgeons using video conferencing can participate in initial patient consultations, allowing them to prescribe only essential tests and treatments. In addition, telehealth programs that transmit patient test results or clinical information and facilitate real-time provider-to-provider communication can give clinicians greater certainty when considering whether to transfer a patient or refer for additional testing or care.

Cost

Improved access and quality of care through telehealth may come at a high cost. Studies are mixed on telehealth's ability to yield significant cost savings. Because telehealth is so dependent on technology, these programs often have significant start-up and capital costs.¹³ And most health systems are supplementing, not substituting, telehealth with brick-and-mortar services.

As technology improves and secure Internet-based programs become more widely available, telehealth may become less expensive and more effective in lowering total health care costs by avoiding unnecessary care and keeping patients healthier.

Telehealth may provide opportunities to address two costly health care concerns — hospital admissions and avoidable emergency

department use.¹⁴ Studies have shown that remote monitoring of patients at home can reduce visits to the hospital and emergency departments.^{15, 16}

These reductions, especially hospital readmissions, can yield significant cost savings and result in a return on investment in managed care and integrated health systems.¹⁷

However, improved access to care may yield increased use, driving up health care costs. Analyses of telemedicine programs in an urban child care setting found that utilization of health care services overall increased slightly. Still, more use did not always increase costs, if less costly services were substituted for more expensive ones like emergency department visits.¹⁸

DEFINITION

Remote-Patient Monitoring

Systems that monitor vital signs and collect key information about patients' health while they are at home can alert providers to potential problems early on. These systems may be used after a patient has had surgery or leaves the hospital. For example, a provider can see early warning signs and may be able to head off problems and prevent the patient from landing back in the hospital. Patients with chronic conditions can transmit pertinent health information to their providers, who can prescribe medications or home treatments.

The State of Telehealth Nationally

Telemedicine has become an integral part of the health care system in other states.

• Arizona

The Arizona Telemedicine Program (ATP) at the University of Arizona Health Sciences Center in Tucson delivers clinical services, medical education and professional training electronically in 20 communities across the state.¹⁹

• California

The telehealth program at the University of California at Davis (UC Davis) has been operating for more than 20 years. Serving more than 100 clinics and hospitals, the program helps residents of rural California gain access to primary and specialty care services.²⁰ It also allows virtual family visits with a patient when

relatives cannot get to the hospital. Physicians around the state can use the system to collaborate with doctors at UC Davis.

• New Mexico

The University of New Mexico's Project ECHO (Extension for Community Health Outcomes) uses phone and video to connect primary care providers in rural and underserved communities with specialists to co-manage patients with common chronic conditions such as diabetes, hepatitis C and lupus. Evaluations on Project ECHO found health outcomes in community locations were equal to those of patients at the University hospital campus.²¹



The State of Telehealth in Colorado

Telehealth in Colorado is growing.

The Colorado Telehealth Network (CTN) was created in 2008 with a \$9.7 million award from the federal government to set up a statewide health care broadband network. Today, CTN provides subsidized broadband connectivity across Colorado on a secure high-speed network. CTN also administers the Colorado Imaging Exchange, a secure archive for storing, retrieving and sharing clinical and diagnostic images.

Colorado Medicaid is also promoting telehealth. Colorado Medicaid reimburses medical and mental health services at the same rate as in-person care, but limits payment to services conducted through live audio-video. Medicaid pays a flat fee for remote monitoring at patients' homes for chronic conditions, including asthma, congestive heart failure, chronic obstructive pulmonary disease and diabetes.

Opportunities on the horizon could further expand telehealth.

Colorado Telehealth in Action

Colorado's health care systems are using telehealth to extend their reach throughout the state. Here's a snapshot of some of these programs:

• **Banner Health**

Banner Health is using telehealth throughout its Colorado locations. Banner's hospitals in Brush, Loveland, Greeley and Sterling have tele-ICUs.

• **Denver Health**

Denver Health conducts electronic visits with prison inmates with minor injuries and illnesses.

• **HealthONE**

HealthONE's CO-DOC Telemedicine Network is active in more than 35 sites across Colorado. Swedish Medical Center in Denver is CO-DOC's hub for rapidly diagnosing and treating suspected stroke patients at remote locations throughout the state, Kansas and Wyoming. Rocky Mountain Hospital for Children at Presbyterian St. Luke's is CO-DOC hub for pediatric echocardiograms. HealthONE is planning to expand CO-DOC telemedicine

services for adult and pediatric specialties.

• **Children's Hospital Colorado**

Specialists in neurosurgery, endocrinology, psychology, neonatology and other specialties at Children's Hospital Colorado connect virtually with patients and providers statewide and in Montana, New Mexico and Wyoming.

• **Centura Health**

Centura Health at Home provides home monitoring for patients with conditions such as COPD, asthma and congestive heart failure.

• **Colorado Access**

Colorado Access is expanding telehealth technology and networks of "telemental" health providers through private enterprises, including AccessCare Services and AccessCare Technologies.

The Colorado Department of Health Care Policy and Financing, which administers the Medicaid program, will use state and federal funding in fiscal year 2014-15 to begin implementing technology for primary care providers to exchange patient information with specialists. It is working with stakeholders to design an online tool, or “eConsult” system, and identify payment methods for participating providers.

Colorado’s State Innovation Model calls for telehealth technology to extend access to integrated physical and behavioral health

care for 80 percent of Coloradans by 2018. The proposal would boost the number of health care sites in CTN by 300. The plan also calls for incorporating telehealth tools into medical settings.

The Colorado Telehealth Working Group was created in 2014 to promote the development, utilization and expansion of telehealth technologies. This group, made up of health care telehealth stakeholders, is addressing barriers to broader use of telehealth technology, including payment reform and licensure.

Opportunities and Barriers

Although many health systems are expanding its use, telehealth is not a significant part of the daily clinical work of most Colorado health care providers. Payment issues, regulatory hurdles and the upfront costs of technology are just a few barriers that limit adoption and expansion.

But policy and regulatory changes can provide better traction for telehealth initiatives.

Payment

- **Barrier:** Private insurers for patients who live in counties with fewer than 150,000 residents cannot require face-to-face contact for services that can be appropriately provided through telehealth, according to Colorado law. This provision assists rural residents who may have difficulty traveling to consultations.

In urban and suburban communities larger than 150,000 residents, insurers have the option to cover telehealth services. This may limit expansion of telehealth programs in these communities. Medicare restricts payment for telehealth services to enrollees who live outside metropolitan statistical areas, which are geographic regions with relatively large populations.

- **Opportunity:** Legislators can lift or revise these geographic provisions to ensure privately insured patients have equal access to telehealth services regardless of where they live. Medicare is taking steps in this direction, proposing to pay for certain telehealth services in rural census tracts within more populated regions in 2015.

- **Barrier:** Payment for telehealth services is not required to be similar or equal to in-person care.

- **Opportunity:** More providers may embrace telehealth if private insurers paid for these services at the same rate as office visits. Mississippi and Tennessee this year passed laws that require private insurers and Medicaid to reimburse all types of telehealth services at the same rate as in-person care.²²

- **Barrier:** Fee-for-service, the prevailing payment model among most public and private insurers, provides limited to no financial incentives for providers to embrace telehealth. This is especially the case if telehealth is not paid at the same rate as in-person care. But that’s not the only hurdle with fee-for-service. Some providers earn money from hospital admissions and emergency department visits — revenue

streams that could decline with the use of telehealth. And even when penalties are imposed for hospital readmissions or overuse of emergency departments, the fines can be minimal compared with the upfront costs required for telehealth programs.

- **Opportunity:** New payment models such as bundled and global reimbursements may make telehealth more financially attractive. Bundled payments offer lump sums for treatment of certain conditions and global payments cover a person's care needs over a set time. Both models expect care coordination, provider-to-provider communication and provider-to-patient interaction, all of which are supported by telehealth.

Licensure

- **Barrier:** Telehealth is boundary-free, allowing patients and providers to connect across state lines. But licensing requirements can get in the way. Most states, including Colorado, require physicians to obtain an in-state medical license. That means a patient, say, in Weld County can't receive telehealth care from a specialist in Illinois unless that provider is licensed in Colorado.

ISSUE

Cross-State Licensure

Cross-state licensure would be a significant change in the medical licensure process in this country, but one with precedent in the nursing community. Colorado is one of 24 states that participates in the Nurse Licensure Compact that allows registered nurses and licensed practical nurses to practice both physically and electronically in other compact states in accordance with those states' laws and regulations.²⁴ Colorado's Nurse Licensure Compact started in 2007.

- **Opportunity:** Physicians in each state are granted licenses based on nearly the same criteria, including national standardized exams. So, some advocates have proposed relaxing interstate licensing laws to allow a physician in one state to practice telehealth in another. Several states issue special licenses or certifications to out-of-state providers to render telehealth services to their residents. Some states, though not Colorado, accommodate providers in contiguous states. Licensing discussions are underway at the national level. The Federation of State Medical Boards has drafted a model interstate compact that could facilitate cross-state licensure.²³

Technology

- **Barrier:** Limited access to broadband Internet may restrict use of telehealth services. In addition, not everyone is online. In 2013, approximately 14 percent of U.S. adults did not use the Internet, rising to 21 percent among those living in rural areas and 41 percent for adults ages 65 or older.²⁵

- **Opportunity:** The Colorado legislature passed several bipartisan bills that will boost broadband access, including redirecting phone service subsidies to the development of broadband Internet in rural and underserved communities.

- **Barrier:** Technology for telehealth programs can be costly. Estimates of per-hospital start-up costs for tele-ICUs range from \$100,000 to \$200,000.²⁶ Programs that require HIPAA-compliant video conferencing systems and integrated scheduling and email may be too expensive for many providers and health systems, especially those in rural communities.

- **Opportunity:** Telehealth costs are decreasing.²⁷ Electronic health record vendors are beginning to incorporate telehealth technology into their systems. The software industry has also taken an interest in telehealth, developing mobile apps such as Doctor On Demand that offer nearly instant access to licensed physicians at



Photo by HealthONE

Dr. Chris Fanale, a neurologist, uses a telehealth control station from Swedish Medical Center.

low costs for 15-minute virtual visits. However the quality of care provided through virtual physician websites is only just being examined. Preliminary evidence in one study suggests that

these sites may increase the risk of misdiagnosis in unusual cases and highlights the need for practice guidelines and telemedicine protocols to ensure quality of care.²⁸

Conclusion

The demands on health care services grow daily. Aging residents and the newly insured are increasing in numbers. And Colorado's health care workforce is already struggling to meet current needs of rural communities.

Done right, telehealth has potential for tackling some of these challenges. Evidence suggests that telehealth can increase access to high-quality care. But it takes time to generate cost savings, if savings show up at all. And current payment models further delay its adoption.

Despite these hurdles, momentum is building in Colorado to make telehealth an integral tool for delivering high-quality care in places that need it most.

State legislators and health care decision-makers can take steps to address some of the current laws and policies regarding reimbursement and licensure that may hinder progress. As greater numbers of Coloradans experience – or come to expect – telehealth, they may also push to put it on the fast track.



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