



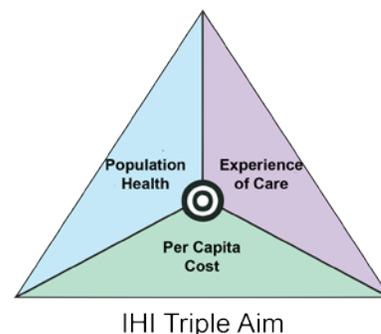
TELEHEALTH: PROMISE AND PRACTICE IN ALASKA

JUNE 2014

This briefing paper defines telehealth concepts, reports some of the current use of telehealth in Alaska hospitals and other locations, and explores possible uses of telehealth in a variety of Alaska settings.

Advantages of Telehealth

Perhaps more than any other recent innovation in health care, telehealth is believed to hold great promise for increasing the likelihood that the American health care system will achieve the Institute for Health Care Improvement Triple Aim:¹ better patient care, improved population health, and lower per-capita cost. According to former Senator Bill Frist, now a senior fellow at the Bipartisan Policy Center, the rapid ascent of the newly empowered health care consumer, and the great advances in information technology together will “channel our chaotic, fragmented, and wasteful health care sector toward a more seamless, transparent, accountable, and efficient system.”² Lee Schwamm of the Partners TeleStroke Network observes that telehealth appears to threaten traditional health care delivery but has the potential to reform and transform the industry by reducing costs and increasing quality and patient satisfaction.³



Telehealth has particular utility in rural and other underserved areas, by connecting patients in remote areas to specialists and intensivists (specialists in critical care medicine) in larger hospitals, while reducing the need to travel to receive services. School-based telehealth has the potential to help schools increase access to health care and collaborate with health care providers, without putting financial burdens on the school.

All Alaskan hospitals use at least some telemedicine applications (typically radiology is outsourced), but they vary widely in their adoption and use of telemedicine. The rapidly-changing landscape will present new opportunities and challenges for Alaskan health systems as more savvy consumers expect increasing convenience and value. Telehealth is often termed a “disruptive” innovation; challenging the health care delivery status quo and fundamentally altering the patient experience.

Telemedicine, Telehealth, Connected Health, mHealth?

The *American Telemedicine Association* (ATA) defines **telemedicine** as the use of medical information exchanged from one site to another via electronic communications to improve a patient’s clinical health

¹ <http://www.ihl.org/Engage/Initiatives/TripleAim/Pages/default.aspx>

² Frist, William H., Connected Health and the Rise of the Patient-Consumer. *Health Affairs*, February 2014, pp. 191-193.

³ Schwamm, Lee H., Telehealth: Seven Strategies to Successfully Implement Disruptive Technology and Transform Health Care. *Health Affairs*, February 2014, pp. 200-205.

status. Telemedicine includes a growing variety of applications and services using two-way video, email, smart phones, wireless tools and other forms of telecommunications technology.

Telehealth is a broader term that often includes telemedicine, health education, and self-management through the internet, although it is often used interchangeably with telemedicine. Patient consultations



via video conferencing, transmission of still images, e-health including patient portals, remote monitoring of vital signs, continuing medical education, consumer-focused wireless applications, and nursing call centers, are all considered part of telemedicine and telehealth.⁴

Connected health is an increasingly common umbrella term that includes telemedicine, telehealth, and health care delivered by mobile devices, or mHealth. Technology-enabled care is a way to engage patients and provide care using tools that are already familiar, comfortable, and ubiquitous, giving the patient more control over their own health and health care. Mobile devices are also increasingly used in the traditional health care setting, blurring the traditional divisions between home-based telehealth and brick-and-mortar based care.

Delivery Methods

Store and Forward: Clinical information provided through the transference of digital images, sounds, or previously recorded video from one location to another to allow a consulting provider to obtain information, analyze it, and report back to the referring provider at a later time.⁵ Store-and-forward communications primarily take place among medical professionals to aid in diagnoses and medical consultations when live video or face-to-face contact is not necessary.

Live (Real-Time) Consultation: Technology to facilitate a patient visit with both service provider and patient present at the same time; the use of a telecommunications system substitutes for an in-person encounter. Interactive audio and video telecommunications are used, permitting real-time communication between the distant site physician or practitioner and the patient.

Self-monitoring or Testing: Services provided by a telemedicine application based in the recipient's home or mobile device, with the provider only indirectly involved in the provision of the service.

Mobile Technologies

Many existing telemedicine vendors are integrating mobile software for telemedicine using smart phones or tablets, as consumer apps for self-monitoring proliferate. Innovation is happening quickly, with new health care applications available daily (over 2,000 telehealth apps are available in the Apple store). However, there is some concern that regulatory, security, and privacy issues are lagging behind.⁶ Mobile phones and tablets can help make health care more personal and convenient, and are contributing to a rapid expansion in home telehealth applications.

⁴ <http://www.americantelemed.org/about-telemedicine/what-is-telemedicine#.U49srVldXiM>

⁵ Source: AK Admin.Code, Title 7, 110.625(a)(2012).

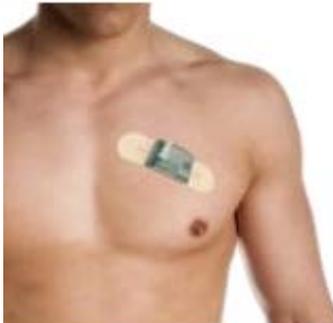
⁶ National Telehealth Technology Assessment Resource Center; <http://www.telehealthtechnology.org/toolkits/mhealth-app-selection>

TELEHEALTH: PROMISE AND PRACTICE IN ALASKA

Home telehealth is no longer confined to elderly, frail, or homebound individuals. Instead, various cell phone apps and online services now let patients communicate precise information directly to providers. Following are some examples of portable devices or mobile apps (with no assurance of their utility or accuracy) presented simply as examples of the diagnostic and treatment tools becoming available. For example, a photo of a rash, mole, or acne can be sent by text or email to a dermatologist. Or, an otoscope attachment on a smartphone can allow a patient to examine, photograph, and transmit a picture of an ear drum or ear canal (*Figure 1*). Many basic diagnostic tools (e.g. thermometers, blood pressure cuffs) can be easily attached to smart phones to transmit information.



Figure 1: The Cellscope Oto



ECGnano is a programmable ECG device that physicians can use to remotely monitor their patient's physical condition for analysis and diagnosis. ECGnano's wireless module plugs into a disposable patch (*Figure 2*).

Figure 2: ECGnano by SolutionMD

Some smartphone or tablet apps enable healthcare professionals to create custom treatment plans that patients follow on their mobile devices, such as physical therapy exercises. Patients can electronically report program adherence and other relevant information back to the healthcare professional (*Figure 3*).

Blood sugar monitoring devices for diabetic patients that communicate either directly or via Bluetooth technology to a cell phone can collect information on blood sugar levels for a period of time. Once the data is captured, the app allows the patient to email their data via their smart phone's Wi-Fi or cellular signal to the recipient of their choice.



Figure 3: Wellpepper: physical therapy instructions being recorded under the provider's guidance, to be used for exercises back in the home.

There are a number of online consulting services (e.g. consultadr.com, Healthcaremagic.com, InteractiveMD.com, Teledoc) patients can access to receive answers to questions, immediate consultation, an appointment for a telephone

consultation, or an e-consult (*Figure 4*). Some insurance companies have used these or similar online consulting services as a low-cost alternative to enhance access to care outside regular business hours. An analysis of Teledoc visits in California concluded that it appears to be expanding access to younger patients who are not connected to other providers and who are less likely to have used health care before.⁷



Figure 4: InteractiveMD.com

⁷ Uscher-Pines, Lori, and Mehrotra, Ateev, Analysis of Teladoc Use Seems to Indicate Expanded Access to Care for Patients Without Prior Connection to a Provider." Health Affairs 33, February 2014: 258-264.

Pristine EyeSight is a HIPAA compliant video streaming solution built for Google Glass that's optimized for healthcare settings. It can be used for education, wound care, field trauma consultation, and specialty consultations, possibly including surgery and ICU.⁸

Facility-Based Telemedicine



Figure 5: Neurological video consult

In stroke telemedicine, also called telestroke, a vascular neurologist/stroke specialist remotely evaluates people who've had acute strokes and makes diagnoses and treatment recommendations to providers at other sites (*Figure 5*). Having a prompt neurological evaluation increases the possibility of receiving clot-dissolving therapies in time to reduce disability and death resulting from stroke.⁹ A telestroke network can improve access to stroke care for rural patients. Providence Alaska Medical Center has partnered with Providence Kodiak Medical Center, Providence Valdez Medical Center, Providence Seward Medical and Care Center, Bartlett Regional Hospital, and Central Peninsula General Hospital to provide acute stroke care services to patients in these communities and plans additional partnerships to provide telestroke services throughout the state.¹⁰

The AFHCANcart (*Figure 6*), developed at Alaska Native Tribal Health Consortium and widely used by the Alaska Tribal Health System, is a compact cart designed to capture data from integrated medical equipment, including a digital camera, spirometer, stethoscope, otoscope, 12-lead ECG, and videoconferencing equipment. The software itself does not require a physical cart to be used, a PC or even a laptop will suffice. It is primarily used to create cases for review by a distant specialist. AFHCANweb is an email-like interface designed for consulting providers. AFHCANmobile is available for Android and iOS, allowing providers to create, view or consult on clinical cases from their smartphone or tablet over Wi-Fi or cellular networks. This helps providers stay connected with their telehealth caseload while they are on the go. Providers also have the option of going to a live videoconferencing session using Vidyo while viewing and sharing clinical information from a telemedicine case.

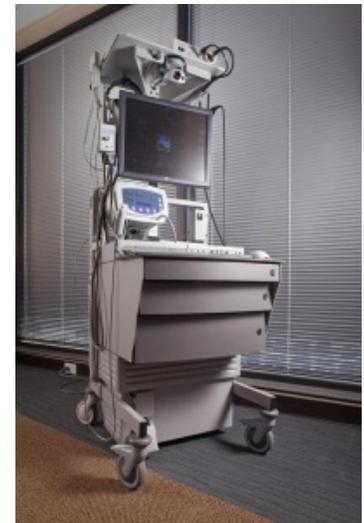


Figure 6: AFHCAN cart



Figure 7: Theranos blood sample

Laboratory services, too, are subject to innovation. Silicon Valley based Theranos needs only a small amount of blood (*Figure 7*), drawn in the physician's office or at one of their laboratory sites (often located in Walgreens), to perform more than 1,200 different Medicare-reimbursed blood tests at a significant lower cost than traditional laboratory services.¹¹

⁸ <https://angel.co/pristine-1>

⁹ <http://www.mayoclinic.org/tests-procedures/stroke-telemedicine/basics/definition/prc-20021080>

¹⁰ <http://alaska.providence.org/locations/pamc/services/stroke/Pages/emergencystroke.aspx>

¹¹ <http://www.theranos.com/for-providers>

TELEHEALTH: PROMISE AND PRACTICE IN ALASKA

According to Howard Reis at the American Telemedicine Association Conference in 2013, Nighthawk has become the generic term for the practice of having an outside service company read emergency room medical images, primarily at night and on weekends. Nighthawk permits an in-house radiology group or solo practitioner to sleep at night, and offers multi-specialty capability which small staff radiology groups often cannot provide. Over the past few years, a second model has evolved. Dayhawk teleradiology firms have begun to provide daytime radiology services primarily to imaging centers, urgent care companies, mobile medical companies and individual physician offices such as orthopedists and ENT practices.¹²

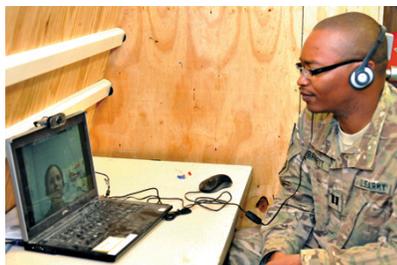


Figure 8: A telebehavioral health visit

Alaska has the highest rate of suicide per capita in the country, and more than 90% of people who die by suicide have depression or another diagnosable, treatable mental or substance abuse disorder, according to the American Association of Suicidology.¹³ To meet the pressing need for behavioral health services in Alaska, the Alaska Psychiatric Institute (API) launched its Telebehavioral Health Care Services Initiative, “to create, promote, and maintain access to behavioral health services through advanced technology in rural and frontier Alaska.” By offering care to people in or near their home communities, access is greatly enhanced and the risk and cost of travel is reduced. API is connected to more than 200 locations statewide. All across the state, patients and providers can access a real-time videoconference with psychiatrists, psychologists, and social workers in Anchorage.¹⁴ Figure 8 shows an example of a telebehavioral health visit using a laptop computer.

Telepharmacy services are also widespread throughout Alaska. The Alaska Native Medical Center provides remote, secure pharmacy services to small clinics throughout the state. SEARHC and Maniilaq also use telepharmacy (Figure 9) to safely dispense medications and consult with patients and providers in remote locations.



Figure 9: a telepharmacy camera, PickPoint bulletproof medication dispensing machine (similar to a vending machine), scanner, bar code reader, and computer.

Conclusions

The trend of do-it-yourself examinations and tests, and customized applications, are part of a shift in health care toward greater consumer participation and responsibility that began with online health information sites and is accelerating with advances in mobile technology. Consumers see at-home digital tools as yet another level of convenience. Given the inconvenience and lost working hours associated with a trip to the doctor’s office, patients, their employers, and their insurance agencies are increasingly interested in the potential that connected health has for saving time and money.¹⁵

Much of Alaska is rural and isolated, and specialty health care is understandably clustered in urban areas. The cost and risk of transportation to obtain needed health services can be partially offset by

¹² Howard Reis, “Nighthawk v Dayhawk – Two Models for Teleradiology;” American Telemedicine Association Conference, 5/2013.

¹³ http://dhss.alaska.gov/SuicidePrevention/Documents/pdfs_sspc/AKSuicideStatistics.pdf

¹⁴ <http://dhss.alaska.gov/dbh/Pages/api/telepsychiatry.aspx>

¹⁵ http://www.nytimes.com/2014/04/26/your-money/health-care-apps-offer-patients-a-more-active-role.html?_r=4



TELEHEALTH: PROMISE AND PRACTICE IN ALASKA

increasing the use of appropriate telemedicine. A robust telehealth system will allow providers to see more patients across the state, mitigating the effects of distance, easing the pressure on rural systems to provide all services to all people, and increasingly putting patients in charge of their own health with familiar, readily accessible tools. By effectively utilizing connected health applications, Alaska has the potential to demonstrate the achievement of the IHI Triple Aim: better patient care, improved population health, and lower cost.

This paper has summarized some of the exciting opportunities and innovations that telehealth can offer to improve health care in Alaska. Follow-up briefing papers will address the challenges faced by Alaska hospitals as they work to expand telehealth services. Many real challenges exist as health care organizations seek to use technology to improve care. Challenges include regulatory, licensing and reimbursement issues specific to Alaska.

More information on telehealth in Alaska is available at the [ASHNHA website](http://www.ashnha.com/policy-and-advocacy/telehealth/) - <http://www.ashnha.com/policy-and-advocacy/telehealth/>

Connected Health: Examples in Alaska Hospitals

Both real-time videoconference and store-and-forward telemedicine modalities are used as care delivery and communication methods for primary care, acute care, and consultations in a wide range of specialties. The following are explanations of some of the ways that connected health is being utilized in Alaskan hospitals, with examples of some hospitals providing or utilizing the service.

Telebehavioral Health – The use of videoconferencing equipment to provide private, secure real-time face-to-face therapy, social work, drug/alcohol counseling, and/or crisis intervention between a provider in a hub site and a patient in a remote location (*Cordova, Ketchikan, Wrangell, Maniilaq, VA, YKHC, API*).

Telepharmacy - The delivery of care via to patients in locations where they may not have direct contact with a . Telepharmacy services include therapy monitoring, remote dispensing, patient counseling, prior authorization and refill authorization for drugs, and monitoring of compliance with the aid of or videoconferencing (*ANMC, Maniilaq, SEARHC*).

Telestroke – The use of telephone, Internet and videoconferencing capabilities by a vascular neurologist/stroke specialist to remotely evaluate patients who've had acute and make diagnoses and treatment recommendations to providers at distant sites (*Bartlett, Central Peninsula, Kodiak, Seward, Valdez*).

e-ICU – The remote monitoring of patients' data in critical care by an expert critical care nurse and board certified critical care physician (intensivist) who analyzes data trends and monitors patients by camera. (*Providence, Kodiak, Bartlett*).

Telerehabilitation – The use of an interactive telecommunication system by a physical therapist in order to provide physical therapy to patients who are located at distant sites (*SEARHC*).

Teleradiology – The transmission of radiological patient images, such as x-rays, CTs, and MRIs, from one location to another for the purposes of sharing studies with other radiologists and physicians (*Petersburg, South Peninsula, Wrangell, Cordova, Sitka, Central Peninsula, SEARHC, Kodiak, Bartlett, Kakanak, Samuel Simmonds, BBAHC, ANMC*).

Teledentistry – The use of digitized and electronically transmitted drawings, diagrams, photographs, and x-rays by a local dental practitioner to a specialist for review and consultation (*Maniilaq, SEARHC, YKHC*).

Tele-Screening for Diabetic Retinopathy – The screening for diabetic retinopathy by electronic transmission of digital photographs of the retina. Often accomplished in a primary care clinic instead of an ophthalmologist's office (*VA*).

Teledermatology – The use of telecommunication technologies to exchange medical information concerning conditions and of the skin over a distance using audio, visual and data communication for diagnoses, consultation and treatment (*ASNA, YKHC*).

Home Telehealth – The delivery of health and education services to patients in their homes by telecommunication devices like the telephone and telecommunication-ready healthcare monitors to check on symptoms, measure vital signs, and provide case management. Daily readings are often transmitted by the patient to a central call center where outliers are quickly identified for follow-up services (*VA*).

Patient Education – The use of videoconference technology to connect dietitians, nurses, and health educators to patients to provide nutrition and other patient education and supportive services (*Kodiak, SEARHC, VA*).