ALASKA TELEMEDICINE: GROWTH THROUGH COLLABORATION

INTRODUCTION

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Alaska telemedicine has undergone a dramatic change in the last ten years as a result of federal funding and intra-state collaboration. Partnerships at the highest levels of federal, state, and private health care organizations have been a major impetus for moving telemedicine forward. Significant inroads have been made with the private sector within Alaska to advance towards a unified telehealth network. The Alaska Federal Health Care Access Network implemented telehealth on a broad scale among Federal and state healthcare organizations. This evolution is the result of a dedicated effort by many participants, strict attention to detail, and lessons learned and shared between all projects.

Early efforts in Alaska telemedicine

History of early projects

The vastness, geography and climate of Alaska make it ideal for telemedicine applications. Alaska has a history of multiple pilots, trials, and services demonstrating the possibilities of telemedicine. Some of the more significant efforts are noted here.

The NASA Applications Technology Satellite 1 (ATS-1) was the first of a series of six satellites to test out new technologies in communications, meteorology and general space research. ATS-1 was launched in 1966 and designed to operate for three years; it actually continued working until 1985! During much of its operational life ATS-1 was used for communications to remote areas, facilitating the delivery of emergency medical services and educational programs in Alaska and the Pacific.

The NASA Application Technology Satellite 6 Project (ATS-6) marked the end of an era and the beginning of a dry spell for NASA experimental communications satellites. This satellite was launched on May 30, 1974 as the largest ATS with a powerful, thirty-foot diameter antenna. The large satellite output allowed ground stations to

Alaska Federal Health Care Access Network, Anchorage, Alaska

receive signals using small inexpensive antennas. NASA used ATS-6 to transmit strong signals to poorer rural or geographically remote communities. ATS-6 was used to broadcast health information and educational programs in Alaska, Appalachian region and India, making space communications directly available to millions of people. In Alaska, the new communications technology, established real time communication from several remote clinics. This project, successfully demonstrated that video technology could be used to connect remote clinicians (nurse, PA, and a community health aide) with physicians and that clinicians could effectively operate the equipment. Of further note to telemedicine, is that on December 7, 1988, a devastating earthquake hit Soviet Armenia. ATS-6 was used to provide telemedicine consultation from Alaska to American medical workers providing relief to victims in Armenia.

Evolution of the community health aide program and communication

The Sanitation Aide Program, Chemotherapy Aide Program, and Village Medical Aide Programs were developed in the mid 1950's in response to the tuberculosis epidemic and public health woes afflicting Alaska's remote regions. Village women were trained to dispense tuberculosis chemotherapy and fulfill basic medical needs. The Community Health Aide Program (CHAP) was formally recognized and funded by the United States Congress in 1968.

Community Health Aides/Practitioners (CHA/Ps) practice under the supervision of a sponsoring physician. There are now more than 500 CHAs practicing in over 158 CHA clinics in remote Alaskan villages. It is natural that communication between these health care providers hinges on available technology as it is a lifeline to healthcare in the villages. In the 1960's the CHAs communicated with a physician using radios. Daily conversations over the radio led to the term "radio-medical-traffic (RMT)," which is still used today to describe communication by other means. In the 1970's the first telephones were installed in remote villages. These telephones were the earliest to rely on satellite link for connection. Satellite telecommunication improved, and fax transmission began in the 1980s, x-ray transmission in the late 1980s, and computer with limited two-way video in the 1990s paving the way for telehealth intervention.

In 1999, the first permanent broadband connectivity was installed with subsidy from the Universal Services Fund (USF). The USF promotes equal access in remote regions by lowering the cost to health care organizations to obtain broadband connectivity. This program grew from a few sites with 128k connectivity in 1999 to approximately 150-200 sites with T1 connectivity in 2004.

Statewide initiatives and collaborations

The earlier achievements in telemedicine were important in validating the concept of telecommunications as an important tool for health care. Future endeavors would include broader efforts at the statewide level to integrate distant communications into daily healthcare services.

The Alaska Telemedicine Testbed Project (ATTP)

In 1996, the National Library of Medicine funded the Alaska Telemedicine Testbed Project (ATTP). This two year contract to the University of Alaska Anchorage (UAA) was to evaluate the efficacy of using narrow bandwidth telemedicine for the treatment of ear disease in remote Alaska village clinics. UAA partnered with the Alaska Native Health Board (ANHB) to eventually deploy telehealth systems to 26 village clinics and 4 regional hospitals - all aligned along the west coast of Alaska. This project was the first major effort in Alaska to deliver store-and-forward telemedicine as a solution for areas with poor connectivity.

The partners in the ATTP recognized that Alaska urgently needed a store-and-forward telehealth solution, due to the serious ear disease problems throughout the rural and remote villages. It was believed this condition could be evaluated with video otoscopy. It was also believed that other clinical needs would benefit through enhanced communication between CHA/Ps in a village and supervising primary care physicians. The use of a simple digital camera was found to be highly effective in the treatment of trauma, wounds, lacerations, rashes, and other maladies.

This project relied on email-based software to transmit still images utilizing a desktop computer, digital camera and video otoscope. Over 3,000 consultations were performed over 2 years using this system, although it is not clear how many of these cases were strictly test or training cases versus real clinical encounters.

The ATTP proved that telemedicine could be delivered using low-bandwidth communications and that the providers believed it was a useful tool. Important lessons stemmed from ATTP, particularly that telemedicine technology needed to be simple yet reliable, attention to detail at all phases is critical (e.g. design, deployment, support), training is extremely important, and that organizations are most successful if they institutionalize the telemedicine process. A powerful lesson learned was that every institution recognized the potential of telehealth and desired to participate; ATTP was necessarily restricted to only four organizations due to funding limitations. It was from this broad ranging support, and the success of ATTP, that a proposal for a larger scale project was developed by the Alaska Federal Health Care Partnership that would serve all Federal beneficiaries in Alaska.

Alaska Federal Healthcare Partnership (AFHCP)

The Alaska Federal Healthcare Partnership (AFHCP) is a unique collaboration of Federal agencies that has been in existence since 1994. The AFHCP has brought together the Department of Veterans Affairs (VA), Department of Defense (DOD), Department of Transportation now the Department of Homeland Security (USCG), Indian Health Service (IHS) and the Alaska Native Tribal Health Consortium (ANTHC) for the purpose of providing the best quality healthcare to over 300,000 Federal beneficiaries in the state of Alaska. The mission of the AFHCP is to provide Federal beneficiaries ready access to quality, customer oriented, compassionate, comprehensive, cost effective healthcare in a healthcare delivery system where the strengths of individual agencies are combined to provide quality customer service.

One of the largest benefits of AFHCP is the effect it has had on healthcare expenditures. Through joint partnership contracting efforts, the AFHCP reports their partners have saved over $1 million annually. Additionally, agencies benefit through recaptured revenue or the ability to generate income by charging other agencies for services provided where they have excess capacity. AFHCP has received a number of recognitions, including the Federal Employee Team of the Year award in 1997 and the Vice President Gore's Hammer Award for Reinventing Government in 1997. The Alaska Federal Health Care Partnership has an executive committee including one member from each of the eight partners.

AFHCP Teleradiology Project

The AFHCP began their first health technology initiative in 1997 by introducing teleradiology to Alaska's four largest Federal health care facilities: Alaska Native Medical Center (ANMC), Elmendorf Regional Medical Center (ERMC), Bassett Army Community Hospital (BACH), and the Veterans Affairs Medical and Regional Office Center (VAMROC). The multiyear project continued from 1998 to 2001 with the addition of computed radiography (CR), workstations, digitizers and frame grabbers to the 11 regional hospitals, subregional clinics, and some villages which included bi-directional functionality. In 2002/03 there was a reassessment of the implementation to include PACS infrastructure to regional Hospitals, and in 2004 the focus included bringing all regional Hospitals to a fully implemented PACS. Currently, 26 of 65 sites have been completed. The implementation to the 7 Regional Hospitals has created opportunities to receive diagnostic services from groups not previously available or practical. This has allowed for more competitive pricing of services and a sharing of WAN access to specific Providers. These hospitals are the hubs to the about 50 outlying facilities (with imaging equipment) and they are able to provide same interpretive service to these remote sites.

In addition to site deployment, the project is developing a centralized archive to offer an off-site redundant archive to all Partners and a brokering service to centralize distribution routing of diagnostic studies in the attempt to create an economy of scale and reduce WAN bandwidth requirements. The program includes training on using the equipment for obtaining, sending and reading x-rays. It further provides training for the non-radiology technologists on how to take quality x-rays. Typically, the remote clinics do not have radiology technologists and rely on physician assistants, nurse practitioners, nurses and community health aides to obtain x-rays.

The program has generated inter-organizational discussions regarding radiology staffing, billing, service contracts and distant teleradiology services. Teleradiology has greatly decreased the turn around times for diagnostic interpretations from 9 to 21 days to within 24 hours and immediate response on emergencies. The program has been a stimulus for regions to invest in additional technology and innovative solutions to resolve radiologist staffing shortages. Traditional radiology requires shipping chemicals, film and other supplies as well as storage and disposal of hazardous waste. These problems are

resolved with computerized radiography. The AFCHP Teleradiology Project is a driver to implementing new imaging services in locations where it was not considered possible because of the obstacles associated with wet processing.

The project is intended to improve delivery of diagnostic interpretive services to remote facilities, most of which required postal delivery of films, the elimination of processor chemicals and film due to associated problems such as film and chemical shipping and storage and low processors utilization.

The Alaska Federal Health Care Access Network (AFHCAN)
The Alaska Federal Healthcare Partnership studied the concept of a major technological push to expand healthcare access based on support generated from all organizations for the earlier ATTP. This led to a funded proposal for an Alaska Federal Health Care Access Network (AFHCAN) Project which began in 1998 to improve healthcare for Federal beneficiaries using pioneering telemedicine technology. Primary revenue for the 4 year AFHCAN Project came through Federal appropriations from the U.S. Department of Defense, Department of Health and Human Services (Office for the Advancement of Telehealth), Indian Health Service and Department of Veterans Affairs. Throughout the life of the AFHCAN project, organizations provided significant in-kind contributions of staff time, resources, and connectivity.

The mission of the AFHCAN Project was to improve access to healthcare for Federal beneficiaries in Alaska through sustainable telehealth systems. The vision of this project was to link 235 sites using a telehealth network. Inherent concepts within this vision included the desire to: create needs based solutions, build flexible and scalable systems, build on existing capabilities, utilize off the shelf proven technology where possible, ensure sustainability, evaluate the solutions, and coordinate efforts with all telehealth projects in Alaska.

AFHCAN member organizations consisted of 39 autonomous healthcare organizations including 32 Alaska Native healthcare organizations representing 195 sites, State of Alaska Public Health Nursing representing 26 sites, US Department of Defense – Army representing 6 sites, US Department of Defense – Air Force representing 3 sites, US Coast Guard representing 4 sites, and Veterans Affairs representing 1 site.

It was recognized that participation of each organization in the design through deployment of the projects was vital to achieving success. All 39 organizations and corresponding 235 sites were represented on a "Steering Board" and also on five "Statewide" committees. The purpose of the AFHCAN Steering Board was to act as a board of directors to the staff of the AFHCAN Project Office (APO), to ensure compliance with the stated missions and goals of the AFHCAN project. The APO was staffed by subject matter experts in biomedical technology, biomedical engineering, software development, telecommunications, clinical primary care, clinical training, research and financial management. APO carried out the day to day management and functions of the project to meet the goals of the implementation plan.

The statewide committees provided professional expertise and knowledge, developed procedures and formulated recommendations in support of the AFHCAN project. The five statewide committees each had a specific focus area: Clinical, Training, Technology, Business, and Informatics - and were staffed by representatives from each of the 39 organizations.

The AFHCAN project was designed as the next generation of the earlier ATTP system. Using lessons learned from those 26 village clinics and relying on many of the same staff, an improved hardware and software platform was developed to focus on delivering Primary Care telehealth to the village clinic. The statewide Clinical committee for AFHCAN recommended the development of a comprehensive store-and-forward system that could move still images (video otoscope ear images, digital camera images, scanned images, other video images) from village to region to tertiary care facility. Furthermore, the physicians on this committee desired a store-and-forward system rather than a live interactive solution because they desired the efficiencies of store-and-forward and felt they did not have time to be in an interactive video consult on a statewide system. Clinicians desired a system that would allow them to receive cases on a computer that they could access during a more available time period.

AFHCAN Telemedicine Hardware and Software
The AFHCAN project office worked with technicians and clinicians from Alaskan organizations to develop an "Advanced Telehealth Workstation" or ATW. Often referred to as the AFHCAN Cart, this is a

mobile platform designed for the frontier clinics of bush Alaska. It is a mobile workstation with fully integrated power regulation, battery backup, and wireless network capability. Many of the lessons learned during the ATTP were incorporated into the design of this cart, including:

- Narrow design (24" width) to fit through clinic doorways.
- Large wheels and lower center of gravity to roll over the uneven floors and door sills found in many clinics
- Redundant power management systems to protect equipment and regulate power delivered to the cart equipment
- Large touchscreen to minimize the need for keyboard and mouse skills
- Simple touch interface to all peripherals
- Trigger button that is shared with patients - especially children - to assist patient education and improve image quality
- Redesigned peripherals based on feedback from users in ATTP
- Expandability to add additional video devices to the cart, digital cameras, and other biomedical peripherals.

The AFHCAN staff conducted a comprehensive review of telehealth software available on the market in 1999. Ease of use and reliability were important factors in considering software products. A key lesson learned during ATTP was expressed by a CHA/P: "If you don't use it regularly, then you will forget how to use it". Low usage leads to loss of learning resulting in poor image and data quality. The high cost of traveling in Alaska raised great concern for support and training costs of a statewide system if it was too complex or too difficult to use. A further consideration in selecting a software platform was the high turnover rate of vendors and products. The software product used for ATTP was no longer available - having been bought and sold by three different companies in less than 18 months. In 1999, there was consensus among AFHCAN organizations that the available telehealth software was too difficult to use, unreliable, uncertain future-wise, too expensive, or did not meet the specific needs of the clinicians. For these reasons the decision was made to develop the AFHCAN telemedicine software for store-and-forward applications.

The AFHCAN software supports the use of a touchscreen and a simple user interface to access biomedical peripherals on the cart, and to review cases by consultants at standard PC workstations. Cases can be sent between providers within an organization, or between servers of autonomous organizations. AFHCAN currently has 42 servers connecting more than 700 providers at more than 200 sites.

The American Telemedicine Association awarded the 2004 ATA President's Award for Advancement of Telemedicine to the Alaska Federal Healthcare Access Network (AFHCAN). The annual award recognizes a project, program, or institution that has made a substantial contribution towards the advancement of telemedicine. Together in 2002, AFHCP and AFHCAN received the National Managed Healthcare Congress' Astra Zeneca Award and also the Grace Hopper Government Technology Leadership Award. These awards recognize projects making exceptional contributions to mission accomplishment, cost effectiveness, and service to the public. AFHCAN received the Gracie because it "harnessed five Federal agencies to fill a critical gap in services". AFHCAN was noted to be innovative for how it is transforming healthcare delivery in rural areas.

The AFHCAN project has been successful because of collaboration among agencies and people at all levels, appropriate and innovative technologies, and clinicians willing to adopt and use telemedicine for healthcare. Since March of 2001, more than 19,000 clinical cases and 3,000 training cases have been conducted, containing 76,000 digital images and 6,000 ECG tracings. The abundance of cases is primary care followed by otolaryngology, audiology, dermatology, and cardiology. Clinicians and patients are looking for new and innovative ways to use the store-and-forward telemedicine hardware and software. Utilization continues to grow - with a 50% growth in FY04 compared to FY03.

AFHCAN Connectivity & Network (WAN)
The introduction of the Universal Services Fund in 1999 spawned the creation of a statewide network linking the sites providing care to Federal beneficiaries. The AFHCAN Informatics Committee approved the design of an AFHCAN Wide Area Network (WAN) which now links more than 60% of the sites participating in the AFHCAN Project. A cooperative relationship with the two major telecommunication

firms in Alaska (GCI Incorporated and AT&T Alascom) led to an extremely efficient system design; colocation facilities at each carrier contain AFHCAN switchgear- thereby allowing every organization to connect with either carrier and yet be no more than 2 hops from any other organization. These two colocation facilities are connected through redundant paths providing an efficient and robust design that facilitates connectivity between all AFHCAN organizations.

The AFHCAN WAN is now used for transmitting and viewing AFHCAN telehealth cases - but is also the transport layer for the AFHCP Teleradiology Project and telepharmacy projects (discussed later). The WAN is also used to provide remote access for distant clinics to hospital information systems (HIS), sharing of hospital data between facilities through a Multi-Facility Integration project (MFI), videoconferencing, telephony (Voice-over-IP) for regional hospitals, and a variety of other services required to deliver healthcare to and from remote locations. Efforts are currently underway to link this WAN with private networks to bridge the gap between federal and private health care providers.

Regional programs in Alaska native health and the federal sector

While ATTP, AFHCAN, and other telehealth projects have provided a structured approach to multiorganizational telehealth in Alaska, many of the regional healthcare organizations have developed programs within their organization to reap the benefits of telehealth. Many organizations developed wide area networks utilizing the USF subsidy to link village clinics to the regional facility for the transport of data, voice, and fax. remote computer access to medical record information. The AFHCAN network is mostly a collaboration of networks - linking regional networks to Anchorage and to other organizations. These organizations have also taken the initiative to create new telehealth opportunities, and to expand on the capabilities offered by AFHCAN and other systems. The following are some of the innovative regional programs in Alaska.

Alaska Native Medical Center and SouthCentral Foundation
The Alaska Native Medical Center (ANMC) and SouthCentral Foundation (SCF) in Anchorage provide regional primary care services and statewide specialty services to Alaskan Natives. This major medical

center has provided interoperational collaboration among departments so that the institution can extend the delivery of care using the latest technologies. This is especially evident by ANMC's dedication to being the referral center for teleradiology, teledermatology, telepharmacy, multi-facility integration and teleotolaryngology. SouthCentral Foundation has been using store-and-forward telemedicine for supervision of CHAs in the Anchorage service unit. They have used videoconferencing for in-house consultation on fetal alcohol syndrome, and they hope to provide a similar service to the regional facilities using this technology.

The ANMC Primary Care Center Pharmacy has initiated a process for the provision of pharmaceutical care through telehealth to remote customers in the Rural Anchorage Service Unit. Using this technology, ANMC is able to provide real-time pharmacy services to patients as far away as St. Paul Island. Automated Dispensing Units are utilized to allow a pharmacist in Anchorage to do a complete review of a prescription order, dispense the drug, print a label as well as patient information, and then to counsel the patient using video conferencing. This also allows total control of all inventories in these remote sites, including controlled substances. This also provides the ability to view all drug product inventories as well as expiration dates and lot numbers in real-time at each site, allowing a decrease in wastage and an increase in accountability. Currently, 11 sites are using this system, with plans to expand this project to all 40 sites that store and distribute medications within the Rural Anchorage Service Unit.

Maniilaq Health Center
The Maniilaq Association in Kotzebue has been a statewide leader in telemedicine. The organization, recognizing the potential for telehealth to improve the access and quality of care, developed a systematic approach to institutionalizing telehealth. The Maniilaq Health Center developed a core telehealth team in the mid, 1990's, composed of clinicians, administrators, technologists, and others. The IT department recruited and trained young local computer and network technicians. The organization supported the adoption of new technologies - including the state's first USF-subsidized network - to enhance communication from the hospital in Kotzebue to the 11 surrounding villages. The medical staff developed a workflow to embrace telehealth with an on-call physician.

Maniilaq Association now accounts for approximately 20% of the statewide store-and-forward telehealth traffic. The network has grown from 128K to dedicated T1 lines to each village that provides video-conferencing in addition to store-and-forward telehealth. Approximately 5% of all clinical encounters at the villages are referred through telehealth; videoconferencing is used equally often and has been used for emergency care, general outpatient care, crisis counseling, and even childbirth. Maniilaq continues to explore new applications for their network - and recently placed preventive health screening kiosks at six village clinic locations. They had implemented dental and medical teleradiology. They work closely with APO to beta test software and new telehealth equipment.

SouthEast Alaska Regional Health Consortium
SouthEast Alaska Regional Health Consortium (SEARHC) in Sitka has developed an advanced WAN to connect 10 regional clinics and the referral hospital. The WAN supports a widely used videoconferencing program for administrative meetings, medical provider and nursing training, behavioral health, dentistry and rehabilitation. The store-and-forward image program has expanded to incorporate a wound care program through Physical Therapy. SEARHC staff estimate that the videoconferencing systems paid for itself in less than one year; it is estimated that $15,000 was saved on transportation cost for administrative meetings in the first four months after implementation.

SEARHC initiated a Telebehavioral Health program in June 2003 which included the development of a telebehavioral health handbook, development of a professional training seminar series, and training on equipment. Telebehavioral health consultations now occur in the villages of Pelican, Angoon, Kake, Klawock, Hydaburg, Juneau, Haines, and Klukwan. The improved communication is increasing access to mental health services, while decreasing travel and costs. Internal partnerships between medical, behavioral health and mental health services are complemented by interest in shared services by Tribal, State and private agencies in HRSA Villages. Plans are to increase marketing and education of SEARHC Telebehavioral Health, increase training and consultation within HRSA Villages, and develop evidence-based interventions for telebehavioral health treatment environments.

Norton Sound Health Corporation and Yukon Kuskokwim Health Corporation

The Norton Sound Health Corporation (NSHC) in Nome and the Yukon Kuskokwim Health Corporation (YKHC) in Bethel provide audiology services to their native Alaskan clients spread out across the western coastal and river delta regions of Alaska. The audiologists quickly embraced store-and-forward technology as a means of consulting with the Department of Otolaryngology at the Alaska Native Medical Center in Anchorage. NSHC has abolished the backlog of patients waiting to be scheduled for regional otolaryngology specialty clinics. Using telemedicine, they reduced the number of in-person ENT referrals by almost 90%.

Eastern Aleutian Tribes

Eastern Aleutian Tribes (EAT) supports eight remote village clinics along the Aleutian Islands connected by a wide area network. The network is utilized for store-and-forward telemedicine as well as videoconferencing. Videoconferencing applications include administrative functions, CHA/P education & training, mental health service delivery, and telepharmacy. The telehealth goals for EAT include availability of medical records for clinicians, access to care, becoming an IT resource for others, and partnering to share human and network resources.

US Coast Guard

The United States Coast Guard has an important presence in Alaska. The USCG Support Center in Kodiak is the largest Coast Guard Base in the U.S. The USCG has worked with AFHCAN to implement store-and-forward telemedicine compatible with the USCG network security requirements. The USCG now has the AFHCAN system at 4 clinics, 2 isolated LORAN transmitting stations and one USCG cutter (marine vessel), with plans to deploy telehealth capabilities on all remaining Alaska-based cutters. Independent Duty Technicians are creating telemedicine cases to send to physicians in Kodiak, Ketchikan and elsewhere. The USCG has also been using teleradiology in Kodiak and Ketchikan for several years. Both teleradiology and the AFHCAN store-and-forward system have been valuable in producing timely x-ray reports and consultations so that USCG clients receive more timely quality care.

US Air Force

Elmendorf Air Force Base Hospital (EAFB) in Anchorage provides dermatology services to all 73,000 active duty servicemen and dependants, as well as 63,000 veterans, stationed in Alaska. Skin problems are prevalent in Alaska - yet Alaska has the lowest concentration of dermatologists in the United States (0.81 per 100,000 population), making it ideal for telemedicine outreach. The one enlisted dermatologist at EAFB utilizes the AFHCAN system for teledermatology to improve access to care and to support the clinicians in the field.

Department of Veterans Affairs (VA),
Veterans Health Administration

The Alaska VA Healthcare System and Regional Office maintains a state-of-art electronic patient care record, a teleradiology and a telemedicine program in support of veteran health care in the state. The VA's computed radiography allows digital images to be transferred between both federal and private locations in Alaska as well as other VA locations in the continental United States. This capability is particularly useful when the Anchorage VA radiologist is unavailable as X-rays can be routed to VA radiologists located in South Carolina or Washington. Additionally, digital images and interpretation can be stored in the patient's computerized record system (CPRS) through a process known as VISTA Imaging. This same imaging capability using scanners provides a means to transfer patient information from private (fee-for-service) care into the CPRS.

The Alaska VA also maintains the ability to provide store-and-forward and live/interactive telemedicine sessions using CPRS and a videoconferencing system. These sessions include primary care, specialty care, and behavioral/mental health services. Connectivity is especially useful for coordination of care between community based outpatient clinics (in Fairbanks and Kenai), the VA medical center (in Anchorage) and tertiary care facilities (in the lower 48). Planning is underway to provide home monitoring of patients, and if successful, this technology will be shared with other interested agencies in Alaska. Additionally, planning is ongoing to extend technological capability to other veteran services such as the Homeless Veterans Service and Vocational Rehabilitation for statewide assessment of veteran program needs.

Alaska Telehealth Advisory Council (ATAC)

The Alaska Telehealth Advisory Council (ATAC) was developed in 1999 at the request of U. S. Senator Ted Stevens and placed under the direction of the Commissioner of the Alaska Department of Health and Social Services. This council is a voluntary organization of committed individuals, whose original charge was to:

- Explore and document the potential for challenges to telehealth development and delivery
- Propose a framework for rational development and deployment of statewide capacity for telehealth systems
- Establish core principles to ensure a coordinated, cost effective, and integrated approach to telehealth
- Consider ways to assess effectiveness, efficiency, and whether telehealth is improving equity of access to health services
- Recommend a long term process for addressing issues as they emerge with changing technologies and practice patterns.

In contrast to AFHCP and the AFHCAN system, which strictly focused on federal beneficiaries in Alaska, ATAC has a broader mandate to look at the impact of telehealth on all Alaskans. Now, five years later, ATAC continues to meet quarterly and confronts the key issues facing telehealth in the state of Alaska. This includes a broad range of issues such as reimbursement, data standards, inter-network operability, and efficacy studies. Early work led to the adoption of statewide technical standards for security, file formats, software, video conferencing, support and maintenance, and telecommunications. ATAC also developed telepsychiatry standards, and sponsored a number of telemedicine pilot projects.

ATAC developed core principles to guide the development of telemedicine in Alaska. These principles, while not always practical to implement, are important because they reflect the underlying core values of the council members:

- All entities should ensure equal access, when financially realistic, to all Alaskans who would benefit from this technology.
- All entities must assure that their systems meet interconnectivity and interoperative standards and participate in the coordination of other telehealth efforts in the state of Alaska.
- All telehealth applications should be acceptable to both the patient and the provider and be easy to use.

- All entities must determine their financial viability for the long term, including the provision of professional capacity development and training as an ongoing component of operating expenses.
- All entities should engage in a needs assessment and evaluation of services.

Regional programs in the private sector

Many health care organizations - unrelated or peripherally related to AFHCAN - have developed telehealth services to provide access to specialty care for their patients. These programs extend health care delivery both outside of Alaska and into the remote regions of Alaska. Some examples of these programs are described here.

WWAMI Rural Telemedicine Network

In 1994, Petersburg Medical Center began a partnership with University of Washington and several other rural hospitals in Washington, Wyoming, Alaska, Montana and Idaho in a network known as the WWAMI Rural Telemedicine Network. The Office of Rural Health Policy originally funded this project. The Network has been used for medical consultations, weekly Grand Rounds and other educational events with the University. The grant expired in 1999, and each hospital participates independently and voluntarily in the network. Since 1999 the transmission lines have also been used for teleradiology.

Alaska Psychiatric Institute

The Alaska Psychiatric Institute (API) Telebehavioral Health Program provides evaluation, diagnosis, consultation and supervision to rural populations with an emphasis on children and families. API is operated by the Department of Health & Social Services-Division of Behavioral Health as the state's only public psychiatric facility. API has worked collaboratively with many state agencies to provide telehealth services throughout the state. The Director of API holds a position on the ATAC, and works with both the AFHCAN Network staff and GCI's ConnectMD program (see later) for connectivity to remote regions. Through these collaborations, API is able to provide high quality videoconferencing for telebehavioral health services to sites such as Galena and Fort Yukon. The API Telebehavioral Health Program provides

evaluation, diagnosis, consultation and supervision to rural populations with an emphasis on children and families. Planned expansion will soon deliver these services to other organizations, including Tanana Chiefs Conference in Fairbanks and Arctic Slope Native Association in Barrow.

Gateway Mental Health
Gateway Mental Health Program in Ketchikan has sponsored and coordinated a telepsychiatry children's clinic that began in January 2002, linking the Bartlett Memorial Hospital child psychiatrist to the community of Metlakatla.

State of Alaska Department of Corrections
The Alaska Department of Corrections was providing telepsychiatry services to outlying prison facilities in Nome, Seward, Fairbanks, Ketchikan, Juneau, Kenai and Bethel using 128k IP videoconferencing equipment. A total of 1517 mental health consultations were conducted between November 1997 and March 2001. The program noted better quality and access to care using the limited bandwidth low-cost technology. The program was discontinued due to staff turnover.

Providence Health System Alaska
Providence Health System Alaska started the first teleradiology project in 1996 to the seven sites of Seward, Kodiak, Dutch Harbor, Valdez, Homer, Talkeetna and Cordova. These sites are frequently inaccessible due to distance, geography, weather and road conditions such as avalanches. Providence sponsors videoconferencing between Anchorage and Seattle Children's Hospital for patient care such as dialogue during Tumor Board. There is also videoconferencing between the Providence Extended Care Center and University of Washington for geriatric and psychiatric services. Providence has been a long time leader in implementing new technologies for health care education and services across the state. For example, Providence:

- Sponsors Consumer Health Information accessible by computer on the internet (Healthwise Medical Reference Library).
- Sponsors Consumer Health Information by telephone access.

- Supports videoconferencing pilots such as those between the Alaska Family Practice Residency Program (Anchorage) and Yukon Kuskokwim Healthcare Corporation (Bethel).
- Pilots telemedicine initiatives to republics of the former Soviet Union.
- Offers the 24 hour Nurse Advice and Tobacco Quit Line.
- Provides web-based training to its employees via the Providence Alaska Learning Institute.
- Supports network connectivity for hospital information system and email access to its three outlying satellite hospitals in Seward, Valdez and Kodiak.

Alaska Rural Telehealth Network (ARTN)

Eleven of Alaska's most rural hospitals and several community health centers have joined to form the Alaska Rural Telehealth Network (ARTN). These organizations will be linked by telecommunications for the purposes of teleradiology, videoconferencing, and other applications. The ARTN has assessed telecommunication needs and is in the process of developing a business plan to be presented to a variety of potential funders. Phase one of the project establishes the statewide teleradiology network for private hospitals and clinics using a local mini-PACs system, with centralized PACs administration and records retention occurring at one central network hub. In order to fully refine the projected costs of this first phase (presently estimated at $7.0 Million), a Request for Expressions of Interest has been issued, to determine the extent of vendor interest inside or outside Alaska in providing radiology equipment, connectivity, or professional (radiology) services to this new network. A formal Request for Proposals (RFP) will be issued after responses to the RFEI are received and evaluated, and potential qualified vendors are identified (i.e., stable companies with a history of quality, efficient service delivery).

ConnectMD

ConnectMD is a private, managed network service of GCI, an Anchorage-based telecommunications company. The network brings together healthcare providers, specialists, payers, educators and medical business services, supporting both rural and urban populations. ConnectMD allows the secure exchange of data, video

and voice, including real-time clinical applications. The network is capable of supporting simultaneous patient data exchanges during a video consultation. It also supports distance education, telepsychiatry, full-motion ultrasound, cardiology, digital radiology, and electronic medical record applications. It accommodates the delivery of all end-user wide area services; and provides network access via traditional private lines or fire-walled broadband internet connections. ConnectMD has partnerships with hospitals and technology providers both in Alaska and Washington State that are also accessible through the network.

Alaska Distance Education Technology Consortium

Alaska Distance Education Technology Consortium (ADETC) represents more than 20 educational organizations and institutions in Alaska. ADETC is developing a long-term distance education plan that effectively generates, coordinates and expands distance education and infrastructure. It also clarifies the role of educators, telecommunication companies, community organizations, government agencies and other stakeholders in meeting the needs identified by members.

Reimbursement

A common theme that affects all telehealth systems in Alaska is the ability to bill, and collect payments for telehealth services. The ATAC has a key role in researching and promoting reimbursement for telemedicine services in Alaska. The ATAC Efficacy Trial was conducted by private sector consultants and provided important data to bring reimbursement to reality.

In September 2001, the Commissioner of the Department of Health and Social Services endorsed recommendations to implement reimbursement for Telehealth services under Alaska Medicaid. Effective October 1, 2001, Alaska Medicaid reimburses co-payments and deductibles for Telehealth services. The "GT" modifier is the modifier denoting services delivered, "via interactive audio and video telecommunication systems." The "GQ" modifier denotes services delivered via "asynchronous telecommunication systems", or store and forward. Medicaid requires that the referring and consulting practitioners be licensed in the state(s) in which each is located and both providers must be enrolled in Alaska Medicaid.

In November 2001, Congress passed legislation authorizing Medicare Part B professional fee reimbursement "for Federal telemedicine demonstration programs conducted in Alaska or Hawaii…when asynchronous store and forward technologies, in single or multimedia formats, are used as a substitute for an inter-active telecommunications system." (Federal Register, Department of Health and Human Services November 1, 2001, Centers for Medicare & Medicaid Services 42 CFR Part 405 et al. Medicare Program: Revisions to payment Policies and Five-Year Review of and Adjustments to the Relative Value Units Under the Physician Fee Schedule for Calendar Year 2002; Final rule Part II.)

Premera (Alaska Blue Cross Blue Shield) is the largest private health insurance program in Alaska. Since the Efficacy Trial results, they have jointly cooperated with ATAC and Medicaid to agree on reimbursement for telemedicine services. It is likely that all major health insurance carriers in Alaska will follow suit.

Future directions

Networks

Alaska has a series of dedicated wide area communication networks for health care, the largest being AFHCAN, Connect MD, Veteran's Affairs, State of Alaska, Providence Health System Alaska, Alaska Rural Telehealth Network, and WWAMI Rural Telemedicine Network. As telehealth programs have grown, so too has the recognition and support for an integrative approach for communication networks. Organizational collaboration in telemedicine has fostered an environment that encourages problem solving in the area of tele-communications. Solutions are being discussed which respect the necessary boundaries of autonomous health care organizations while creating network connectivity for the secure exchange of health care information.

AFHCAN Transition

The Alaska Federal Health Care Access Network is transitioning from a Federal project to a more sustainable business model. AHFCAN has restructured its divisions to include Product Development, Customer Support, Training, and Sales/Marketting. Operations includes emphasis on project development process and

quality assurance. AFHCAN technologies will undergo major refresh of technology and installment of "next generation" AFHCAN telemedicine software. This application will address the major lessons learned during the eight years of operating the ATTP and AFHCAN systems, and will include deployment of some new peripheral devices for the telemedicine carts. Organizations will share some of the financial costs associated with refresh and installation. Organizations will be encouraged to adopt service level agreements with AFHCAN for continued product development, training, and support.

Merging of Federal and Private Programs

AFHCAN was designed and implemented as a Federal and Native Alaskan health care initiative. There is a long tradition of the private sector filling needs not met by the Federal health care system, such as subspecialty care. There is now an overriding philosophy within the Federal telemedicine system to share the technology and lessons learned with the private sector of Alaska. AFHCAN is working with private health care organizations interested in a store-and-forward telemedicine solution.

Summary

The last thirty years have brought the introduction and expansion of telecommunications to rural and remote Alaska. The intellectual and financial investment of earlier projects, the more recent AFHCAN Project and the Universal Service Administrative Company Rural Health Care Division (RHCD) has sparked a new era in telemedicine and telecommunication across Alaska. This spark has been flamed by the dedication and collaboration of leaders at the highest levels of organizations such as: AFHCAN member organizations, AFHCAN Office, Alaska Clinical Engineering Services, Alaska Federal Health Care Partnership, Alaska Federal Health Care Partnership Office, Alaska Native health Board, Alaska Native Tribal health Consortium, Alaska Telehealth Advisory Council, AT&T Alascom, GCI Inc., Health care providers throughout the state of Alaska, Indian Health Service, U.S. Department of Health and Human Services, Office of U.S. Senator Ted Stevens, State of Alaska, U.S. Department of Homeland Security – United States Coast Guard, United States Department of Agricul-

ture, United States Department of Defense – Air Force and Army, United States Department of Veterans Affairs, University of Alaska, and University of Alaska Anchorage. Alaska now has one of the largest telemedicine programs in the world. As Alaska moves forward, focus must be placed in two major areas: 1) ensuring the system now in place become self-sustaining, and 2) collaborating with all stakeholders in promoting the growth of an integrated, state-wide telemedicine network.

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