Socioeconomic Impact of Mandated Health Coverage for Telemedicine in the State of Arizona

Ana Hincapie, MS

Terri L Warholak, PhD, RPh

Edward P Armstrong, PharmD

The University of Arizona

College of Pharmacy

1295 N Martin Ave

Tucson, Arizona 85721

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Telemedicine Report

Background

Telemedicine is defined as "the practice of health care delivery, diagnosis, consultation and treatment and the transfer of medical data through interactive audio, video or data communications that occur in the physical presence of the patient, including audio or video communications sent to a health care provider for diagnostic or treatment consultation."[1] The terms telemedicine and telehealth are often used interchangeably, but it is widely accepted that telemedicine is a subset of telehealth.[2] Telehealth is a broader term and includes telenursing, telepharmacy, telepresence and many other types of healthcare delivery, that are provided at a distance using telecommunications systems.

Telemedicine comprises "hub and spoke" interactions. The "hub" refers to the location of the telemedicine-consulting provider, which is considered the place of service. The spoke is the location where the patient receives the telemedicine service. For many implementations, telemedicine utilizes real time, interactive video conferencing consultations. In another modality of telemedicine, store-and-forward telemedicine, the transfer of diagnostic images and/or data are stored for subsequent review and analysis. Real-time consultations are referred to as synchronous telemedicine. Store-and-forward consultations are asynchronous consultations, that is, collection and transfer of data is for later review.

Telemedicine has gained popularity across the United States, currently more than 3000 programs have been established.[3] Telemedicine allows patients to be treated in real-time by physicians in different locations and by specialists where such services are not available in their treating health care center. Millions of teleradiology cases have been diagnosed by teleradiologists in hubs. This has altered the landscape in healthcare delivery in both rural and urban communities by providing access to diagnostic services 24 hours a day, 7 days a week throughout much of the United States (US). Hundreds of thousands of prisoners receive many of their medical services via telemedicine. Use of telemedicine in the US Department of Veterans Affairs is on the rise. In addition, Arizona is a national leader in telemedicine. Over 1,000,000 Arizona telemedicine cases have been handled over the Arizona Telemedicine Program's state-wide telecommunications network, housed at The University of Arizona in Tucson, and operated by University of Arizona staff engineers. This network connects over 50 communities and over 150 sites by broad-band telecommunications. The Arizona Telemedicine Program was established by the Arizona State Legislature in 1996 and has been in continuous operation since then.

US rural areas face limitations in their health care delivery systems. Generally, medical specialists and subspecialists do not reside in rural Arizona. Distance and limited transportation services may delay or prevent health care access for rural populations.[4] This is especially true for access to specialty medical services (e.g., cardiology, dermatology, pathology). Moreover, Arizona has a shortage of health care providers. A report from the Health Resources and Services Administration, (HRSA), State Health Workforce Profiles positioned Arizona 25th out of 50 states in the total health services employment and 47th in health services employment per 100,000 population.[5] Telemedicine has the potential to overcome staffing scarcity and infrastructural problems, especially in remote and underserved areas.[6] In addition, telemedicine can support rural providers by supplying frequent and relevant access to specialists.[7]

Overall, patients have expressed high levels of satisfaction with telemedicine services. A study performed at the University of Arizona, evaluating patients' perceptions of a telepsychiatry program in Arizona found that patients perceived that care was more accessible to them because of telemedicine. Seventy-four percent of patients indicated that traveling would have been required if teleconsultation had not been available.[8] Arizona is a national leader in the area of telepsychiatry. Tens of thousands of patient sessions have taken place through the telemedicine network of the Northern Arizona Behavioral Health Authority (NARBAH), founded in 1996, which provides behavioral health services to Medicaid patients in the Northern half of the state (approximately 60,000 square miles). The NARBAH network is affiliated with the Arizona Telemedicine Program.

Federal agencies such as the Centers for Medicare & Medicaid Services (CMS), and some private health plans, are paying for telemedicine services in Arizona and nationwide; however there is not coverage parity between plans concerning payment for services, as this report will further illustrate.

Effectiveness

Research widely documents the effectiveness as well as clinical and financial benefits of telemedicine services in numerous health care areas and its feasibility as an alternative to traditional health care services. Telemedicine has grown into to a sound, effective, cost-effective, and practical technology to deliver care.[9] In addition, telemedicine services have successfully resolved problems of access. Telemedicine covers a wide range of clinical services and applications provided by many health care specialists.[10] In Arizona, telemedicine services have been provided in over 61 subspecialties of medicine, surgery, pediatrics, radiology, pathology, and many others. This report will summarize the benefits of telemedicine with a focus on the services existing in Arizona. There are programs in almost all medical specialties that primarily serve rural, elderly and veterans' populations. Table 1 displays examples of telemedicine applications.

Some Applications of Telemedicine	
Cardiology	Oncology
Dentistry	Ophthalmology
Dermatology	Pathology
Emergency care	Pediatrics
Endocrinology	Psychiatry
Home care	Radiology
Managing disabilities	Sign-language communication
Medical education	Sports medicine
Neurology/neurosurgery	Surgery
Obstetrics/gynecology	Urology

Table 1: Telemedicine Applications[10]

Many systematic reviews assessing the effectiveness of telemedicine have been published in the medical literature.[6,11-16] Although the quality and scope of these reviews varies, substantial evidence exists to support that telemedicine is a viable alternative to traditional face-to-face medicine that yields equal health outcomes between the two approaches.[3]

The Agency for Healthcare Research and Quality (AHRQ) evaluated the effectiveness of telemedicine as a substitute for face-to-face medical diagnosis and treatment of the Medicare population. Based on the published peer-reviewed literature, AHRQ concluded that telemedicine

is most effective for verbal interactions (e.g., videoconferencing for diagnosis and treatment in specialties like neurology and psychiatry).[17,18]

Overall, the benefits of telemedicine include: 1) decreased unnecessary patient travel; 2) decreased number of unnecessary in-person specialty clinic appointments; 3) decreased waiting time for specialty consultations[19]; 4) improved communication with health care providers; 5) improved monitoring of chronic health conditions[17]; and 6) decreased time between referrals and clinical encounters.[20] Moreover, telemedicine provides a solution for the shortage of specialized health care personnel in rural areas, as well as some urban areas, and enhances efficiency in clinical decision-making, prescription ordering and monitoring.[6,21]

For example, telemedicine has proved to be beneficial to improve access to mental health care services such as substance abuse treatment, management of depression and post-traumatic stress disorder (PTSD).[22] Specifically, telepsychiatry improves access to care, patient-provider communications and patient satisfaction.[6] In addition, research has shown that outcomes in stroke patients improve when appropriate medical care is provided in a timely manner. Specifically, telestroke management can improve the rate of quick, appropriate stroke treatment with intravenous thrombolytics.[21,23,24]

Home telemonitoring is defined as the remote monitoring or care delivery to patients at their homes by a provider at a distant setting using information and communication technology.[25] Home telemonitoring applications are diverse and represent an important tool for chronic disease management or conditions that require close monitoring, clinical evaluation and prompt intervention to avoid adverse events such as hospitalization or emergency visits.[26] The most common telehome programs monitor congestive heart failure, chronic obstructive pulmonary disease (COPD), psychiatric conditions and diabetes.[25]

Overall, published evidence suggests that home telemonitoring can achieve equal or better health outcomes than conventional care.[27] Home telemonitoring may provide better clinical outcomes for patients with congestive heart failure compared with usual care.[27] The impact of home telemonitoring interventions on healthcare utilization, mortality, and is positive in the majority of the studies reviewed.[28-30] Other benefits of home telemonitoring on congestive hearth failure include improved patient compliance with treatment plans, patient satisfaction, quality of life, and improved cognitive level.[28] A systematic review that analyzed 21 original studies on home telemonitoring for patients (3,082 patients) with congestive heart failure found a mortality risk reduction (risk ratio= 0.64; 95% CI: 0.48–0.85) in the telemonitoring group compared with usual care.[31] This study also found a reduction in the number of emergency department visits for the home telemonitoring group.[31]

Evidence from home telemonitoring programs for chronic obstructive pulmonary disease (COPD) shows similar result to those found in congestive health failure home telemonitoring programs.[32] A study that reviewed 9 original studies (858 patients) found that home telemonitoring interventions were equal or better than usual care for quality of life, patient satisfaction outcomes, and rates of hospitalization and ED visits for COPD telemonitoring programs compare to usual interventions.[33] A randomized controlled trial found a reduction in hospital admissions in the home telemonitoring group compared with the control group (0.17, SD 0.23 versus 0.30, SD 0.30; p=0.019).[34]

There is a considerable body of literature that supports telemedicine and home telemonitoring as being a cost-effective health care system from a health care and insurance provider.[35] The difference in cost savings between telemedicine and face-to-face treatments relies on avoiding traveling costs for either the specialists or patients.[15,16,22] However, some studies have suggested that telemedicine can be equally effective but more expensive due to the cost of implementing and maintaining the telemedicine networks. The cost differences must be balanced by the clinical benefits of providing access to specialty care for rural populations.[22] Moreover, experience from a correctional telemedicine program demonstration project, reported in 1999, suggested that capital costs could be recovered in less than 2 years if the volume of encounters is moderate (approximately 100 per month).[36] Capital equipment costs have fallen drastically since then. Also, the recent migration to electronic tablets and smart telephones, and the broadening availability of 3G and 4G networks will make the technology even cheaper. The need for dedicated telecommunications networks for telemedicine will likely diminish over the next five years. The current rapid roll-out of telemedicine "apps" will also decrease equipment costs even further.

Recent programs in other states have demonstrated the potential of cost-saving that telemedicine can achieve. For example, the Texas Department of Criminal Justice, through the University of Texas Medical Branch (UTMB) contracted a telemedicine program integrated with electronic medical records to provide care services to three federal prisons, 120 state prisons, and 15 youth prisons. Estimates from the Department of Justice and Department of Defense Joint Program Steering found that a telemedicine consultation would cost an average of $71 compared to $175 for a conventional face-to-face consultation, which represents a 60% savings.[37]

(a) The extent to which the treatment or service is generally utilized by a significant portion of the population.

The Arizona Telemedicine Program (ATP), headquartered at the University of Arizona in Tucson was co-founded in 1996, by State Representative Robert "Bob" Burns and University of Arizona professor, Ronald S. Weinstein, M.D., with the goal of increasing access to specialty health care to Arizonans, especially to those who are underserved and/or live in rural areas. ATP operates a broadband telecommunications network that serves approximately 159 sites throughout Arizona with information technology services and tele-education services. Many independent healthcare organizations provide teleconsultations over the ATP's broadband telemedicine network.

During its 16 years of operation, Arizona telephysicians provided over 1,200,000 teleconsultations over the ATP's network. The large majority of cases were teleradiology cases. Since many of the 55 healthcare organizations, which are members of the ATP, do not report case outcomes, the sampling of patients for whom outcome data is available is somewhat limited to the cases seen by University of Arizona faculty members who are members of University Physicians Healthcare (this organization recently changed its name to University of Arizona Health Network).

A study conducted by members of the University Physician Healthcare teledermatology group found the time between receiving a specialty referral and having the encounter with a dermatologist was significantly shorter for teleconsultation than for in-person visits. This is especially significant because there were no significant differences in the type of cases referred for telemedicine compared to face-to-face consultations.[20]

A retrospective study that reviewed the first five-year period of telepsychiatry services provided by University Physicians Healthcare telepsychiatrists, over the Arizona Telemedicine Program Network found that a total of 1,086 teleconsultations were provided to 206 patients. It was noted that 77% of these teleconsultations were provided to adults and 23% to children aged 2-17. The data indicated that patients were satisfied with the service. The authors concluded that the telepsychiatry program filled an important medical specialty service gap in rural Arizona.[38]

The ATP has provided telecommunications network services to the Arizona Department of Corrections (DOC) since 1998. Thanks to this program, physicians can examine inmates without physically visiting the correctional facility. Telemedicine services, in over 10 medical specialties have been available in 10 out of 11 Arizona state prisons, resulting in a savings of $1 million per year for the DOC. These substantial savings are derived primarily from a decrease in inmate transportation costs to visit physician specialists. Guards for the prisoners are also a significant expense. In addition, public safety is very important. Concerns about inmates escaping during transport to receive medical care are reduced when telemedicine is used in lieu of face-to-face appointments.[39]

Another telemedicine provider, and an affiliate of the ATP, the Northern Arizona Regional Behavioral Health Authority telemedicine program (NARBHAnet), has delivered almost 70,000 telepsychiatry consultations since its foundation in 1996. NARBHAnet services provide care for the seriously mentally ill (33%), children (27%), general mental health (28%) and substance abuse (12%). A published report from this program indicated that the majority of patients preferred to receive psychiatry teleconsultations rather than traveling from rural communities when the distance they had to travel for care was 48 miles or more.[40,41]

Trauma services are very important in the state of Arizona. Trauma is the leading cause of death for Arizonans in the 1 to 44 year-old age group and it accounts for 66% of all deaths reported in the state. However, access to trauma care is quite limited outside of Phoenix and Tucson metropolitan areas. The University of Arizona Medical Center (UMC)-University Campus in Tucson is the only level I trauma center in southern Arizona. This is staffed by University Physician Healthcare physicians.

To address this disparity in access, the Southern Arizona Telemedicine and Telepresence (SATT) program was initiated to connect UMC with 7 rural hospitals in Southern Arizona via telemedicine. The SATT program offers around-the-clock trauma and emergency management patient care, facilitating the virtual presence of an experienced trauma surgeon. A publication reporting the initial experience with SATT showed that 59 teleconsultations were provided during the first four years of the program. Out of those 59 consultations, 6 were considered potentially lifesaving, 17 patients were kept in the rural hospitals which avoided approximately $19,698 per air transport or $2,055 per ground transport (2009 US dollars).[42]

In addition, the evidence clearly shows a rural–urban disparity in acute stroke management practices in Arizona as well. Greater than one third of Arizona's residents live outside of Phoenix and Tucson without access to emergency stroke expertise. Therefore, members of the Arizona Mayo Clinic established the Stroke Telemedicine For Arizona Rural Residents (STARR) network in 2007 to address this disparity in care.[43] A recent cost-effectiveness study that included data form Mayo Clinic Telestroke Network and data from other states' telestroke networks suggests that telestroke is more cost-effective compared to usual care (i.e., remote emergency departments without telestroke consultation or stroke experts) using a lifetime perspective. In the base case analysis, compared to usual care, telestroke resulted in an

incremental cost-effectiveness ratio (ICER) of $108,363/quality-adjusted life year (QALY) in the 90-day horizon and $ $2,449/QALY in the lifetime horizon.[44]

Copper Queen Community Hospital (CQCH), Benson Hospital, Northern Cochise Hospital, Southeastern Arizona Medical Center, and Mt. Graham Hospital formed the Southern Arizona Telemedicine Alliance (SATA) establishing a telecardiology program. These institutions lack rural cardiology services in southeastern Arizona in both emergency and clinic settings. Mt. Graham Hospital has tried to recruit a cardiologist for three years without success. For this reason, SATA represents the only mean for providing cardiology services to more than 172,000 people. The Arizona Department of Health Services (ADHS) has identified cardiovascular disease as the leading cause of death, and leading cause of hospitalizations for the citizens of Cochise County, which, according to their data is served by only one full time cardiologist, located in Sierra Vista, many miles away from the other hospitals in Cochise County.[45]

During the first six months of operating the Copper Queen's telecardiology program, 36 patients in the Emergency Department needed a cardiology consult (See Figure 1). After being seen by the cardiologist, only nine of the patients needed to be transported to Tucson. Before the program, all 36 would have needed to be sent by ambulance or helicopter to another facility because that specialty wasn't available. The cost savings to patients and insurers was approximately $540,000, a total of $10,000 per transfer cost and an additional $10,000 per hospital stay for the 27 patients who had their care provided locally. These same positive financial outcomes can be seen with the other specialty medical services provided through the hospital's telemedicine program.[45]

Transfers/Non-transfers	
Acute Care Consults - Transferred	4
Acute Care Consults - Not Transferred	22
ED Consults - Transferred	5
Ed Consults - Not Transferred	5
Total Patients	36

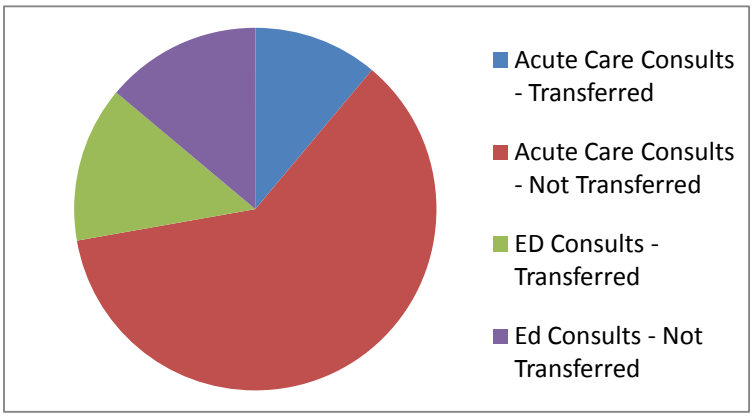

Figure 1. Copper Queen Community Hospital Telecardiology program December 2009-June 2010

Earlier this year, Carondelet Neurological Institute, in collaboration with three rural hospitals in Southern Arizona, initiated a Telestroke program. When a person experiencing symptoms of stroke arrives at their own community hospital, the hospital's on-site Emergency Room Stroke Team is activated and brain computerized tomography (CT) scanning is performed. With the patient's consent, a telestroke link, using videoconferencing and image sharing technology, is launched. The telestroke system has several features: a brain imaging review, remote

examination via video conferencing and the ability to immediate transfer digital images between the Emergency Department and the neurologist at Carondelet Neurological Institute. This program is giving access to neurologists to patients in Nogales, Safford and Sierra Vista.[45]

More recently, Phoenix-based Banner Health announced the launch of their own telemedicine program (eICU) that will be available to every critical care hospital in Arizona. This program includes critical care nurses and physicians who will be available to remotely monitor intensive care unit (ICU) patients 24 hours a day, seven days a week as a backup to existing rural bedside caregivers. This is the replication of a successful program in other states such as Nebraska.[46]

The University Physician Healthcare's pediatricians have been providing tele-echocardiology service, over the ATP's Network, for infants in the Neonatal Intensive Care Unit (NICU) at the Yuma Regional Medical Center, since 2006. To date, 418 infants have received these important acute pediatric cardiology services. Six pediatricians in Tucson provide the services on a rotating basis. Critical decisions include whether the infant needs to be transported by helicopter or fixed wing aircraft to Tucson or Phoenix for surgery. Based on the stability of the infant, a decision is made on whether a nurse needs to be on the aircraft.[47]

University Physician Healthcare pathologists, in Tucson, have provided subspecialty, second opinion and quality assurance surgical pathology services to over 4,100 patients in Havasu, Cottonwood, Payson, and Globe, over the ATP Network, between 1993 and 2002. This includes 142 intraoperative frozen section cases in which a Tucson telepathologist diagnosed a frozen tissue specimen, just removed at surgery, using a robotic telepathology system controlled from Tucson.[48,49] Also, 148 Tucson women with breast disease have received same day mammography services, bundled with same-day laboratory testing, and received their test results within 6 to 8 hours. This provided a new potential standard-of-care for breast cancer patients or women with suspicious mammograms and could become an important urban application of telemedicine. Bundling radiology and laboratory services saves money by offering a single admission process for multiple services. Also, by doing this in a single day, loss of work time is minimized.[50]

Ophthalmologists at St. Luke's Hospital in Phoenix, who staff the Arizona Foundation for the Eye, have done over 4,100 digital retinal (eye) exams for patients at Mountain Park Community Health Center, in South Phoenix, using teleophthalmology. The Arizona Foundation for the Eye has been a long-time member of the Arizona Telemedicine Program Network. Digital retinal screening showed that approximately one-third of the 4,100-screened patients needed to be seen in-person for further evaluation. Of those patients, one third needed laser therapy. Without the laser therapy, it is likely that many of the patients would have eventually become blind. There are other teleophthalmology programs in the state. The Indian Health Service has a large digital retinal screen program, on a number of Reservations. Also, the University Physician Healthcare's ophthalmologists have done digital retinal examinations for diabetes for the Arizona Department of Corrections.[47]

This represents but a sampling of uses of telemedicine in Arizona. There are many other programs. For example, University Physician Healthcare doctors are providing tele-infectious disease services both for the Arizona Department of Corrections and the Pima County jails. Telerheumatology services are provided at Arizona Community Health Centers. The Susan G. Komen Foundation supports tele-support group programs for breast cancer survivors, in five rural communities.[47]

For years, radiologists in Arizona have been taking night calls from their homes using teleradiology. Recently, some other specialists have begun to develop home-based telemedicine programs. Susan Sisley, M.D., is an Assistant Director of the Arizona Telemedicine Program. Dr. Sisley is evaluating the efficacy and cost-effectiveness of having a home-based telepsychiatry practice. Over the past three years, Dr. Sisley has been seeing patients, using bi-directional video, from a telemedicine suite in her home-based office in Scottsdale. In 2010, Dr. Sisley, performed 3,500 telepsychiatry sessions for psychiatric patients in several distant communities, including an Indian Reservation clinic and other geographically disadvantaged rural clinics. Dr. Sisley estimates that her efficiency has increased 30 percent since she migrated to an "all-telepsychiatry" practice model. She sees more patients and has drastically reduced travel time and fuel consumption. Dr. Sisley has presented her data at a national meeting.[47]

(b) The extent to which the insurance coverage is already generally available.

Unfortunately, existing limitations on telemedicine services covered by public and private insurance programs inhibits the growth of telemedicine in Arizona. Arizona statutes recognize the use of telemedicine services under Title 36, Article 1. Arizona health care organizations can deliver services via telemedicine, but coverage for telemedicine services is not mandated.[1] Most financing and reimbursement for telehealth services comes from Arizona Medicaid and Medicare. Overall, Medicare and Arizona Medicaid reimburse telemedicine services at the same rate as when they are provided in a face-to-face consultation.

Medicaid

Within the US, 39 state Medicaid programs provide at least some reimbursement for telemedicine services, with behavioral health experiencing the most rapid expansion of reimbursement policies.[51] The Arizona Medicaid program, Arizona Health Care Cost Containment System (AHCCCS), covers medically required consultation and treatment via telemedicine services for all eligible members, when provided by an appropriate AHCCCS registered health care provider. AHCCCS does not require prior authorization (PA) for medically necessary telemedicine services when provided by eligible fee-for-service (FFS) specialists.[52]

The telemedicine specialist can bill for services if they are also providing a separate AHCCCS covered service by a provider registered with AHCCCS. Currently, AHCCCS-covered telemedicine services include, but are-not-limited-to:

- Behavioral health
- Cardiology
- Dermatology
- Hematology/pathology
- Inpatient consultations
- Medical Nutrition Therapy
- Office (adult and pediatric), outpatient, and surgery follow-up consultations
- Ophthalmology
- Pain management
- Pathology
- Pharmacy management
- Radiology

The facilities that are AHCCCS-eligible to be a hub or spoke site include: 1) Indian Health Service clinics; 2) Tribally-governed 638 facilities; 3) Urban Clinics for American Indians; 4) the office of a physician or other practitioner; 5) hospitals; and 6) Federally Qualified Health Centers (FQHC).

The types of providers who may bill AHCCCS for telehealth services include: physicians; registered nurse practitioners; physician assistants; certified nurse midwifes; clinical psychologists; licensed clinical social workers; licensed marriage and family therapists; and licensed professional counselors. AHCCCS reimburses telemedicine services in two ways: 1) an all-inclusive rate (AIR); and 2) fee-for-service.

Medicare

Coverage and payment for Medicare telemedicine services includes: consultation; office visits; individual psychotherapy; and pharmacologic management delivered via a telecommunications system.[53] Eligible geographic areas include health professional shortage areas (HPSA) and counties not classified as a metropolitan statistical area (MSA). Additionally, Federal telemedicine demonstration projects may serve as the originating site regardless of geographic location.

Eligible sites for telemedicine coverage include offices of physicians or practitioners; critical access hospitals; rural health clinics (RHC); FQHCs; hospitals; skilled nursing facilities; in-hospital dialysis centers; and community mental health centers.

Practitioners who may bill Medicare for telemedicine services include:

- Physicians
- Nurse practitioners
- Physician assistants
- Nurse midwifes
- Clinical nurse specialists
- Clinical psychologists
- Clinical social workers
- Registered dietitians or nutrition professionals

However, clinical psychologists and clinical social workers cannot bill for psychotherapy services that include medical evaluation and management services under Medicare.

Eligible medical services for telemedicine include:

- Consultations (Current Procedural Terminology (CPT) codes 99241-99275)
- Office or other outpatient visits (CPT codes 99201-99215)
- Individual psychotherapy (CPT codes 90804-90809)
- Pharmacologic management (CPT code 90862)
- Psychiatric diagnostic interview examination (CPT code 90801)
- End stage renal disease related services (HCPCS codes G0308, G0309, C0311, G0312, G0314, G0315, G0317, and G0318)
- Individual medical nutritional therapy (HCPCS codes G0270, 97802, and 97803)

Health professionals delivering telemedicine services are reimbursed at the same rate as paid for face-to-face care. Claims for reimbursement must be submitted with the appropriate CPT

code for the service provided and the Telehealth modifier "GT" to indicate that care was delivered via an interactive audio and video telecommunications system.

As noted in the 2011 "Medicare Physician Fee Schedule Final Rule" published on November 29, 2010, CMS is adding 14 CPT codes to the list of reimbursable telemedicine services. These include: individual and group kidney disease education services; individual and group diabetes outpatient self-management training services; group medical nutrition therapy services; group health and behavior assessment and intervention services and subsequent hospital care; and nursing facility services. Payment for these services will be made at the applicable Physician Fee Schedule payment amount for the service of the physician or practitioner.

Private Insurance

A 2003 survey conducted by the American Telemedicine Association (ATA) and American Medical Development Telemedicine found that of 72 telemedicine programs in the United States that provided billable telemedicine services, there were 38 programs in 25 states that received private payer reimbursement. Blue Cross/Blue Shield (BC/BS) was reimbursing for telemedicine services in 21 states.[54] In 2005, data from a follow-up survey showed that of 64 respondents, 62 provided billable telemedicine services but only 58% were receiving reimbursement for those telemedicine services from private payers. [55]

Data from January-September 2011 of the Southern Arizona Telemedicine Alliance (SATA)-Copper Queen hospital telecardiology program show that private payer reimbursement remains limited in Arizona (See Table 2). All the claims submitted to private payers were denied for this period.[45]

Table 2: SATA telecardiology reimbursement for Cooper Queen January-September 2011

Service: Initial Consult (whether in the ED or Inpatient)	Charge	Payment	Percent denials	Insurance	Range of payment per payer	
30 minutes consult (G0425)	$200.74	$0.00		BCBS OF AZ	BCBS OF AZ	0
	$200.74	$79.63		AHCCCS MERCY CARE PLAN	AHCCCS MCP	$79.63
	$200.74	$175.78		AARP MEDICARE COMPLETE	AARP	$175.78
	$200.74	$43.95		MEDICARE	MEDICARE	$43.95
Average:	**$200.74**	**$74.84**	**25%**			
50 minutes consult (G0426)	$273.66	$103.75		MEDICARE	MEDICARE	$0 - $108.46
	$273.66	$0.00		MEDICARE		
	$273.66	$0.00		MEDICARE		
	$273.66	$83.51		MEDICARE		
	$273.66	$0.00		MEDICARE		
	$273.66	$108.46		MEDICARE		
	$273.66	$113.14		AHCCCS UNIV FAMILY CARE	AHCCS UFC	$0 - $252.10
	$273.66	$97.17		AHCCCS UNIV FAMILY CARE		
	$273.66	$0.00		AHCCCS UNIV FAMILY CARE		
	$273.66	$27.12		AHCCCS UNIV FAMILY CARE		
	$273.66	$252.10		AHCCCS UNIV FAMILY CARE		
	$273.66	$156.98		AHCCCS UNIV FAMILY CARE		
	$273.66	$0.00		AARP MEDICARE COMPLETE	AARP MCP	0
Average:	**$273.66**	**$67.30**	**43%**			
70 minutes consult (G0427)	$402.08	$0.00		MEDICARE	MEDICARE	$0 - 126.76
	$402.08	$126.76		MEDICARE		
	$402.08	$0.00		MEDICARE		
	$402.08	$82.58		AHCCCS UNIV FAMILY CARE	AHCCCS UFC	$82.58
Average:	**$402.08**	**$52.34**	**50%**			

ED= Emergency department, BCBS=Blue Cross Blue Shield, AARP= American Association of Retired Persons

(c) If coverage is not generally available, the extent to which the lack of coverage results in persons avoiding necessary health care treatments.

Many patients in rural and isolated areas must travel long distances to receive certain types of specialty medical care.[56] Patients in some areas must travel distances that require more than one to two hours to reach a specialist.[19] This may translate in a loss of productivity because patients may have to take time off work or find child or elder care and thus ultimately may affect a patient's decision to seek health care.[57] Because of the complexities of traveling from rural areas, patients may choose to not obtain required health care.

There is a general agreement about the importance of seeking and receiving prompt medical attention for major illness.[58] Research indicates that delayed health care can result in negative health outcomes. For example, multiple chronic diseases may occur after the onset of diabetes mellitus, including end stage renal disease, blindness, cardiovascular disease, and lower extremity amputations. Successful control of chronic diseases such as diabetes may prevent or delay these complications from occurring.[59] A study showed that almost 20% of Medicare beneficiaries discharged from hospitals between 2003-2004 were readmitted within 30 days and 34% were readmitted within 90 days. Most of these readmissions were preventable and accounted for $17.4 billon dollars. The lack of follow-up after hospital discharge was suggested as the primary reason for these readmissions.[60] In addition, there is an established association between long wait times for outpatient health care and negative health outcomes, including mortality.[61] Moreover, delaying health care is associated with longer hospital stays (which are more costly than preventative care). This suggests that reimbursing for telemedicine preventive services may save health care systems significant healthcare resources in the long term.

(d) If the coverage is not generally available, the extent to which the lack of coverage results in unreasonable financial hardship to a patient.

The impact of patient financial hardship will vary by the type of telemedicine services required. A clinical encounter-cost analysis by researchers in the ATP estimated patient direct out-of-pocket costs range between $44-$234 (2000 USD) in addition to traveling costs and other indirect costs associated with having to take time off work or finding and paying child or elder care.[62] Typically, private insurance does not reimburse for these travel costs leaving patients with the burden of paying for these expenses out-of-pocket. For example, a study that randomized Department of Defense patients to receive teledermatology or conventional (face-to-face) dermatology referral did not find differences in the direct costs incurred by patients. However, total costs for the conventional services group were higher due to loss of productivity; the average cost per patient was $340 for teledermatology versus $372 per patient receiving conventional usual care (2006 USD).[57] It is anticipated that the financial hardship might worsen when patients require treatments with multiple visits.

A broader view of the financial hardship includes the costs associated with specialty providers' traveling to visit patients in rural and isolated areas when patients do not travel. A study from the NARBHA telepsychiatry program in Arizona estimated the cost savings of this program for one month during 2007. Rather than using telemedicine, the researchers estimated the psychiatric services would be provided by four provider agencies with on-site visits. Within one month, the providers would have been required to make 33 trips, covering 8,009 miles, spending 140.6 hours driving. A total of $3,885 per month in provider salaries plus $1,724 in meals and $1,797 in lodging during provider trips would have been required if telepsychiatry services were not available. Moreover, the time spent travelling in a month would be the same as the time required to examine 180 patients.[40]

The absence of consistent, comprehensive reimbursement policies is often cited as one of the most serious obstacles to total integration of telehealth into current health care practice.[63] The lack of an overall telehealth reimbursement policy reflects the multiplicity of payment sources and policies within Arizona.

(e) The level of public demand for the treatment or service.

It is difficult to assess the level of public demand for telemedicine services because of the wide scope of services that can be provided. However, the investment of millions of dollars in grants

for telemedicine demonstration projects reflects the high level of public interest in telemedicine care.

- A 1997 survey of 2,472 nonfederal rural hospitals indicated that 30% of rural health care organizations were involved in telehealth.[4]

- The Department of Commerce reviewed telehealth projects supported by 21 federal agencies. These projects totaled $332 million on telehealth projects in 2001.[64]

- The Agency for Health Care Research and Quality (AHRQ) has invested federal money in projects that focused on implementing and/or evaluating telehealth in order to improve care for patients, increase efficiency, and contain costs.

- A 2008 report from AHRQ evaluated grantees and contractors who implemented telehealth projects. This report found that the majority of telemedicine initiatives occurred in rural areas in order to provide specialized medical services to these rural communities (Table 3).[65]

GRANT	US REGION	RURAL URBAN PROJECTS	SETTING
Creating Online Neonatal Intensive Care Units (NICU) Networks to Educate, Consult and Team	Southeast	Rural	Integrated Delivery System– Intensive Care Unit (ICU)
Health Information Technology (HIT) -based Regional Medication Management Pharmacy System	Midwest	Rural	Critical Access Hospital – Pharmacy
Home Heart Failure Care Comparing Patient-Driven Technology Models	Midwest Northeast	Rural	Long Term Care – Home Health Care
Implementing Technology to Transform Quality in South East Kern County	West	Rural	Primary Care – Adult
Measuring the Value of Remote ICU Monitoring	Southeast	Urban	Integrated Delivery System– ICU
Project ECHO (Extension for Community Healthcare Outcomes)	Southeast	Rural	Integrated Delivery System– Primary Care – Adult
Technology Exchange for Cancer Health Network (TECH-Net)	Southeast	Rural	Integrated Delivery System– Primary Care
Telewoundcare Network	Midwest	Rural	Wound Care – Long Term Care– Home Health Care
Valuation of Primary Care-Integrated Telehealth	Northeast	Urban	Primary Care – Pediatric

Table 3: ARHQ funded telehealth project until 2008, ICU: Intensive care unit.

- The Office for the Advancement of Telehealth (OAT) from the Office of Rural Health Policy promotes the use of telehealth technologies for health care delivery, education, and health information services. The 2010 OAT budget was $11.6 million without including the Congressionally Mandated Programs.[66]

- The Distance Learning and Telemedicine Program (DLT) from the Unites States Department of Agriculture (USDA) Rural development provides loans, grants and loan/grant combinations to foster telecommunications technologies that enhance learning and health

care opportunities for rural residents.[67] Since 1995, Arizona has received more than $6 million from this organization.[68]

- The Rural Health Care Program of the Universal Service Fund (USF), which is administered by the Universal Service Administrative Company (USAC), make discounts for telecommunication services and Internet charges to rural health care facilities.[69]

- The US Department and Human Health Services is planning to change their regulations because of changing technologies. At this moment hospitals have to individually credential each doctor providing telemedicine service from a remote location. With the reform, Medicare will permit telemedicine with a provider credentialed at a distant hospital as long as the distant facility participates in Medicare and there is a written telemedicine agreement in place between the hospitals. It is expect to reduce providers burden and increase access to care in rural areas.[70]

Based on these projects, there appears to be a high level of public acceptance of telemedicine services. A systematic review of studies of patient satisfaction with telemedicine evaluated 32 studies. All studies reported good levels of patient satisfaction with telemedicine services.[71]

(f) The level of public demand for insurance coverage of the treatment or service.

To date, twelve states have enacted laws requiring that health plans pay for telemedicine services (see Table 4).[72]

Year enacted	State	Covered Benefits	Limitations
1995	Louisiana	Whenever a health care service is performed via transmitted electronic imaging or telemedicine, reimbursement shall not be denied to a licensed physician conducting or participating in the transmission at the originating health care facility who is physically present with the patient and is contemporaneously communicating and interacting with a licensed physician at the receiving terminus of the transmission.	Reimbursement to the physician at the originating facility shall not be less than 75% of the payment that that licensed physician receives for an intermediate visit. Any health care service performed via transmitted electronic imaging or telemedicine shall be subject to the applicable utilization review criteria and requirements of the insurer.
1996, 2008	California	Does not require face-to-face contact for services appropriately provided through telemedicine	Consultation provided by telephone or fax not covered
1997	Oklahoma	Services that a health care practitioner determines to be appropriately provided by means of telemedicine, shall not require person-to-person contact between a health care practitioner and a patient.	Consultation provided by telephone or fax not covered
1997	Texas	May not exclude a telemedicine medical service or a telehealth service from coverage under the plan solely because the service is	Any deductible, co-payment, or co-insurance for telemedicine or telehealth services may not exceed that which is required for a

		not provided through a face-to-face consultation.	comparable medical service provided through a face-to-face consultation.
1999	Hawaii	Shall not require face-to-face contact between a health care provider and a patient for services appropriately provided through telehealth.	Consultation provided by telephone, fax or email not covered
2000	Kentucky	Shall not require face-to-face contact between a health care provider and a patient for services appropriately provided through telehealth.	Consultation provided by telephone, fax or email not covered
2001	Colorado	In a county with less than 150,000 residents, face-to-face contact for services may not be required for services appropriately provided through telemedicine.	Consultation provided by telephone, fax or email not covered
2006	Georgia	Payment must be provided for services that are covered under the health benefit policy and appropriately provided through.	Standard telephone, fax, unsecured electronic mail, or a combination do no constitute telemedicine
2009	Maine	Must provide coverage for health care services provided through telemedicine if the service would be covered were it provided through in-person consultation between the covered person and a health care provider.	Telemedicine does not include the use of audio-only telephone, fax or e-mail. Insurers may limit coverage to those health care providers in a telemedicine network approved by the insurer. Contracts may contain a deductible, co-payment or co-insurance for services provided through telemedicine as long as it does not exceed the deductible, co-payment or co-insurance applicable to an in-person consultation.
2009	New Hampshire	An insurer offering a health plan in this state may not deny coverage on the sole basis that the coverage is provided through telemedicine if the health care service would be covered if it were provided through in-person consultation between the covered person and a health care provider.	Group visits are not approved at this time. Asynchronous “store and forward” telecommunications systems are not covered.
2009	Oregon	Must provide coverage of telemedical health services if: (a) the plan provided coverage of the service when provided in person; (b) the service is medically necessary and supported by evidence-based medical criteria; and	Health plans may not distinguish between originating sites that are rural and urban in providing coverage. Plans may subject coverage of telemedical services to all terms of the plan, including but not limited to deductible, co-payment or co-insurance requirements that are

		(c) the service does not duplicate or supplant a health service that is available to the patient in person.	applicable to coverage of a comparable service provided in person.
2010	Virginia	An insurer, corporation, or health maintenance organization shall not exclude a service for coverage solely because the service is provided through telemedicine services and is not provided through face-to-face consultation or contact between a health care provider and a patient for services appropriately provided through telemedicine services.	Utilization review may be undertaken to determine the appropriateness of telemedicine services.

Table 4: Telehealth Mandated Coverage In the US. There are pending legislations in Connecticut and Tennessee.

(a) The extent to which the coverage will increase or decrease the cost of the treatment or service.

The use of telemedicine services may require initial equipment purchase or rental to begin providing services in areas where it has not previously been delivered. For example, The ATP charges participating sites a membership fee to offset operating costs showing to be a sustainable program. Ongoing telemedicine services should provide cost savings to health care systems by no longer requiring provider specialists to travel to rural communities and thus decreasing the costs of providing care. In addition, telemedicine has also been shown to decrease patient costs by reducing unnecessary transportation and decreasing health care costs by decreasing duplicative tests (i.e., rural and urban testing of the same patient), improved disease prevention, and improved chronic disease management.[73]

There have been studies conducted in Arizona supporting improved health outcomes and reduced costs using telemedicine for trauma patients and those patients requiring emergency services. A review of the first five years of a teletrauma program showed that the six (10%) teletrauma consults were life saving, the treatment was changed in 29 of 35 (83%) trauma patients because of the telepresence of a trauma surgeon during the resuscitation phase. Additionally, 17 (29%) of patients remained at rural hospitals (i.e., no transportation costs were needed) saving an average of $ 19,698 (2009 USD) per air transport or $2,055 per ground transport. The investigators indicated that the costs of avoiding one unnecessary transfer through teletrauma may offset the entire direct costs of one teletrauma hardware system at the referring hospital.[42]

(b) The extent to which the coverage will increase the appropriate use of the treatment or service.

The low rate of private insurance coverage is a barrier to expanding telemedicine. However, it is not the only obstacle to increasing the use of telemedicine services. There are strict professional licensure restrictions in order to provide telemedicine services. Several studies support that licensure and certification requirements prevent providers from delivering care via telemedicine.[74-76] For example, the ATP currently services several areas of Arizona, and a limited number of surrounding states (Utah, Nevada and New Mexico).[39] Telemedicine providers also have difficultyobtaining medical malpractice coverage.[77]

(c) The extent to which the mandated treatment or service will be a substitute for a more expensive treatment or service.

It is anticipated that telemedicine will be a significant substitute for more expensive treatments and services. A cost analysis of 8 telemedicine sites in Arizona indicated that the overall costs of telemedicine may be lower than traditional face-to-face services if telemedicine networks are properly utilized.[78] This analysis compared cost data of telemedicine versus conventional face-to-face clinical specialist consultations. The investigators reviewed the telemedicine cases by site, diagnosis, clinical specialty, ethnicity, billing cost, and complexity of the clinical encounter between May 2000 and April 2001. The differences in consultation costs were associated with the number of telemedicine consultations performed by site. The results of this analysis found a range of $64 costs saved to $33 cost gained per diagnosis provided through telemedicine. The authors suggest that the variability of these costs was from the patient opportunity costs associated with travel to the urban site for specialty services and the volume of utilization of telemedicine specialist services at the delivery site.[78] However, if telemedicine services are underutilized, it may be more costly than traditional face-to-face services.

Some have suggested that the initial costs of delivering telemedicine services may be counterbalanced by the cost of equipment depreciation. Other factors that might contribute to decreased direct medical cost differences between face-to-face and telemedicine services include reductions in the cost of future equipment, increased reimbursement rates for telemedicine services, and development of innovative telemedicine activities to offset fixed-cost expenses.[7] The extent to which telemedicine becomes a cost-saving service relies on its capability to decrease unnecessary traveling costs, improve triage, and avoid the long-term costs of improperly managed chronic diseases.

(d) The extent to which the coverage will increase or decrease the administrative expenses of insurers and the premium and administrative expenses of policyholders.

The Council for Affordable Health insurance issued a report in 2010 where an independent actuarial working group on mandated benefits estimated the percentage of premium costs. Using actual health insurance policies from 9 states (CA, CO, KY, LA, ME, NH, OR, PA, TX), this study found that the total impact of mandated telemedicine was less than 1% of the costs.[79]

(e) The impact of this coverage on the total cost of health care.

Mandated Telemedicine coverage is not expected to increase the total cost of health care. Medicare and Arizona Medicaid reimburse providers equally for both telemedicine and traditional face-to-face services. The use of telemedicine services may require initial equipment purchase or rental to begin providing services in areas where it has not previously been delivered. Ongoing telemedicine services should provide cost savings to health care systems by no longer requiring provider specialists to travel to rural communities and thus decreasing the costs of providing care. In addition, telemedicine has also been shown to decrease patient costs by reducing unnecessary transportation and decreasing health care costs by decreasing duplicative tests (i.e., rural and urban testing of the same patient), improved disease prevention, and improved chronic disease management.[73]

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