

Building Successful Telemedicine Programs

Ronald S. Weinstein, M.D.
Director, Arizona Telemedicine Program
Professor, Dept. of Pathology
College of Medicine
University of Arizona



© 2017 ARIZONA TELEMEDICINE PROGRAM

Telemedicine

The **Institute of Medicine** defines telemedicine as “**the use of electronic information and communications technologies to provide and support health care when distance separates the participants.**”

© 2017 ARIZONA TELEMEDICINE PROGRAM

Western Governor's Association Telemedicine Action Report 1995



“Western Governors are committed to improving access to and quality of health care for people living in the rural west.”

© 2017 ARIZONA TELEMEDICINE PROGRAM

Western Governor's Association Telemedicine Action Report 1995 - Barriers

- Infrastructure Planning & Development
- Telecommunications Regulation
- Reimbursement for Telemedicine Services
- Licensure & Credentialing
- Medical Malpractice Liability
- Confidentiality

© 2017 ARIZONA TELEMEDICINE PROGRAM

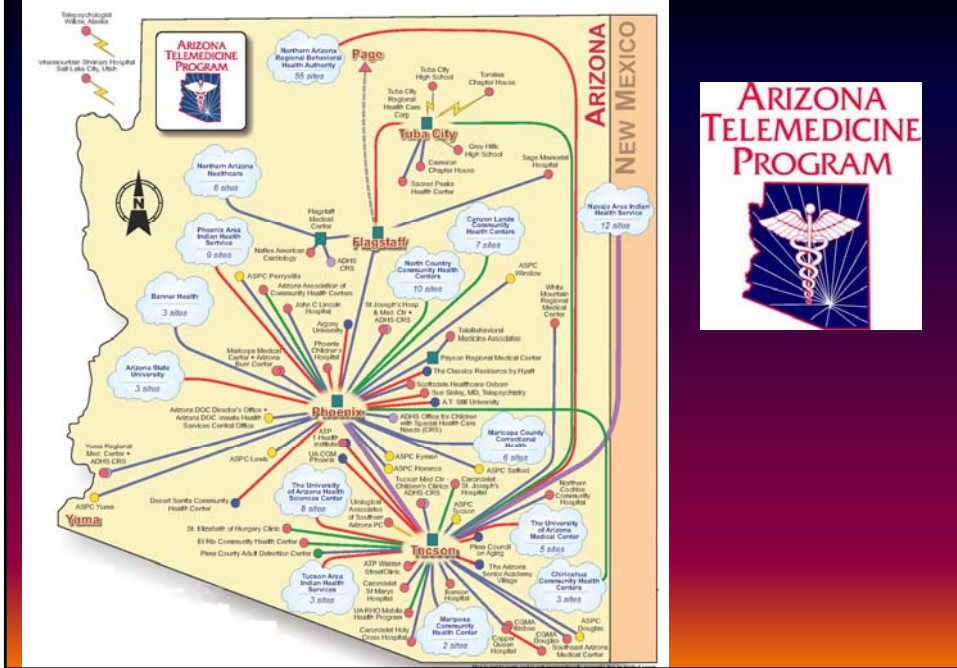
ARIZONA TELEMEDICINE PROGRAM



1996

© 2017 ARIZONA TELEMEDICINE PROGRAM

ARIZONA TELEMEDICINE NETWORK





ARIZONA
TELEMEDICINE
PROGRAM

Arizona
Telemedicine
Program
Scott, Arizona

Founded in 1996, funded
by the Arizona State
Legislature

>1.3 Million Cases

© 2017 ARIZONA TELEMEDICINE PROGRAM

160+ Sites

- Urban & rural hospitals
- Native American healthcare
- Prisons & jails
- Community health centers
- Schools
- Distance learning affiliates
- International Sites

© 2017 ARIZONA TELEMEDICINE PROGRAM

Telemedicine Services

© 2017 ARIZONA TELEMEDICINE PROGRAM

ARIZONA TELEMEDICINE SERVICES



ARIZONA TELEMEDICINE PROGRAM

Telemedicine

Subspecialty Consultations

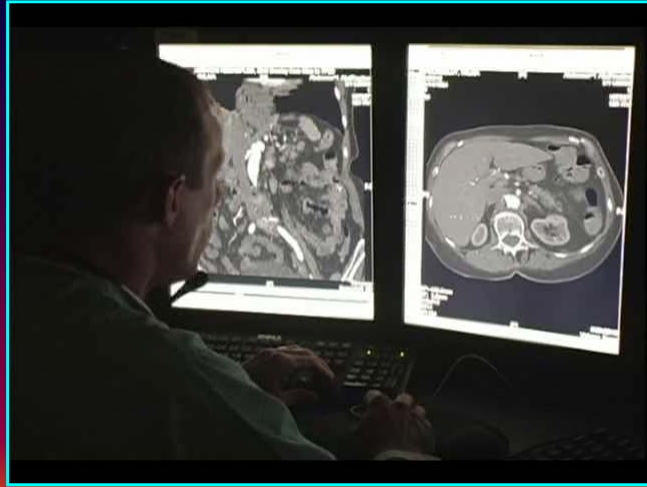
<ul style="list-style-type: none"> Anesthesiology Cardiology Dental Dermatology Endocrinology Fam. & Comm. Med. Gastroenterology Genetics Geriatrics Hematology/Oncology Hepatology Infectious Disease Integrative Medicine Internal Medicine Molecular Diagnostics Nephrology Neurology 	<ul style="list-style-type: none"> Neurosurgery Ob/Gyn Ophthalmology Orthopedics Otorhinolaryngology Pain Clinic Pathology Peds. Cardiology Peds. Dermatology Peds. Endocrinology Peds. Gastroenterology Peds. Hem/Onc Peds. Infec. Disease Peds. Nephrology Peds. Neurology Peds. Ophthalmology Peds. Oral Surgery 	<ul style="list-style-type: none"> Peds. Orthopedics Peds. Psychiatry Peds. Pulmonology Peds. Rheumatology Peds. Urology Psychiatry Radiology Reprod/Infertility Rheumatology Sports Medicine Surgery Surgical Oncology Transplantation Toxicology Urology Vascular Wound Management
---	--	---

© 2017 ARIZONA TELEMEDICINE PROGRAM

ARIZONA

Telemedicine

Teleradiology



© 2017 ARIZONA TELEMEDICINE PROGRAM

Telepsychiatry



© 2016 ARIZONA TELEMEDICINE PROGRAM

Tele-Urgent Care

- Teletrauma -

University of Arizona Health Network (multiple communities)

- Telestroke

Mayo Clinic Telestroke Network (11 rural communities)

- Teleburn

Arizona Burn Center (Maricopa Medical Center – 12 Sites)

- eICU (electronic Intensive Care Units)

Banner Health eICU Network (7 Banner hospitals)

© 2017 ARIZONA TELEMEDICINE PROGRAM

Teletrauma



© 2017 ARIZONA TELEMEDICINE PROGRAM

Stroke

is the third leading cause of death in the United States and the leading cause of adult disability.

Approximately 795,000 strokes occur each year, and delays in diagnosis contribute to the mortality and disability associated with stroke.

TeleStroke

supports community hospitals by providing:

- 24-hour on-call stroke specialist
- Emergency department acute stroke consultation
- Bedside follow-up (depending on site needs)
- Stroke follow-up appointments (depending on site needs)



WHEN STROKE BEGINS, EVERY SECOND COUNTS

Stroke is a medical emergency that requires early assessment and early treatment. Rapid identification of acute stroke patients enables the timely administration of effective and appropriate stroke therapies that can improve patient outcomes. It also allows for initiation and coordination of strategies to prevent stroke progression, recurrent strokes, and common complications.


and transportation barriers with reliable technology that allows immediate access to stroke experts who can provide consultation with on-site providers to manage acute stroke as needed.

Keep stroke patients close to home.
With TeleStroke, community hospitals can provide stroke care to

HOW TELESTROKE WORKS

COMMUNITY HOSPITAL

- 1 Doctor receives patient's status, determining need for stroke evaluation
- 2 Telestroke mobile unit brought in to patient
- 3 Patient speaks directly to the Telestroke doctor and follows examination instructions
- 4 If necessary, hospital staff prepares patient for AirMed transport



TELESTROKE DOCTOR

- 1 24-7 on-call Telestroke doctor receives call or page
- 2 Doctor begins video conferencing and evaluates patient data
- 3 Exam given via Telestroke system to evaluate presence or severity of stroke
- 4 Consultation with community hospital on best treatment plan for patient




"Telemedicine saves hundreds of thousands of dollars in travel expenses for doctors, nurses and patients each year."

Robert Kerr
Budget Analyst, Principal
Arizona Telemedicine Program

**Advances
in
Telemedicine, Telehealth, mHealth
and Connected Health**

Testimonial Issue
2014

**ARIZONA
TELEMEDICINE
PROGRAM**



A publication of the Arizona Telemedicine Program

© 2017 ARIZONA TELEMEDICINE PROGRAM

TELE-HOME HEALTH CARE:

‘Care Beyond Walls and Wires’ Enhances Life for Patients with Congestive Heart Failure

Case Study

More than 5 million people in the U.S. suffer from congestive heart failure (CHF), according to the Centers for Disease Control and Prevention (CDC). The annual cost is estimated at more than \$12 billion in medications, and lost earnings, the CDC says. Northern Arizona Healthcare’s “Care Beyond Walls and Wires” can improve CHF patients’ health and reduce health care costs.

Wholesly Smith and his daughter, Rita Yazzie, used to drive an hour or more to Flagstaff Medical Center, nearly two hours away. Mr. Smith is living with congestive heart failure, with symptoms as severe as he required frequent hospitalizations.

But Mr. Smith can now avoid those months without his hospital. He has received a device called Care Beyond Walls and Wires, a telemedicine program that monitors his heart with continuous data for three months.

The program monitors his heart with and respiratory status for three months.

“It’s phenomenal,” registered nurse for Flagstaff HealthCare, who works with Walls and Wires at Flagstaff Medical Center. “Mr. Yazzie says ‘Wires’ is the best thing for me. I’ve had two hospital readmissions since the program more than a year ago.”

And at 90, Mr. Smith has been able to return to his favorite activity: riding his horse.

Care Beyond Walls and Wires provides patients with a backpack containing the equipment they need to check their blood pressure, measure their oxygen level, and check their weight daily. The latter because patients with CHF can gain or lose weight suddenly. The data are automatically transmitted to a smart phone that transmits the information to Northern Arizona Healthcare’s care coordination office, which provides the smart phone, monitoring equipment and a backup to every patient enrolled in Care Beyond Walls and Wires.

Some of the program’s patients have received a device that monitors their heart rate and blood pressure.

The San Diego telecommunications company Qualcomm was chosen to lead the project, with Microsoft-based Zephyr Technology and Verizon providing software, smart phones and remote monitoring hardware.

Northern Arizona Healthcare agreed to fund an initial project involving 50 patients, to get under way in late 2015.


“The study if you need really support,” Mr. Smith said in Superstition Canyon on an early ride. “Our patients require, and within a few days.”

“Care Beyond Walls and Wires” is an investment,” Mr. Sorenson says. “It’s the investment,” patients benefiting from the program, including Mr. Yazzie.

“I wish my patient like the feeling that they were cared for like that,” Mr. Sorenson says. “We couldn’t have asked for anything more. It’s a great win.”

“Care Beyond Walls and Wires is the best thing ever for me, and the best thing for my dad.”

Rita Yazzie



© 2017 ARIZONA TELEMEDICINE PROGRAM

TELE-INFECTIOUS DISEASE:

‘I Couldn’t Do This Without Telemedicine’

Steve McCroskey is a family nurse practitioner with 200 patients scattered across more than 60,000 square miles in northern Arizona. With his employer, North Country HealthCare, he created a program for patients with HIV and AIDS. Because North Country is on the Arizona Telemedicine Program telecommunications network, Mr. McCroskey can see patients via telemedicine or face to face, as often as they need to see him.

Steve McCroskey was 10 when he contracted HIV. He was diagnosed with AIDS in 1985, when he was 20. He had been hospitalized for the past year, and he was in a coma. He had been hospitalized for the past year, and he was in a coma. He had been hospitalized for the past year, and he was in a coma.

Mr. McCroskey was a medical student at the University of California, San Diego, when he was diagnosed with AIDS. He was a medical student at the University of California, San Diego, when he was diagnosed with AIDS. He was a medical student at the University of California, San Diego, when he was diagnosed with AIDS.

A few years ago, Mr. McCroskey was living in Flagstaff and practicing family medicine in Phoenix, Arizona, which borders on the Hopi and Navajo reservations. He asked his employer, North Country HealthCare, a Federally Qualified Health Center with clinics in Flagstaff and 13 other communities, if he could develop a program specifically for patients with HIV and AIDS. He wanted to divide his practice between telemedicine and in-person patient visits. North Country readily agreed.

The practice is now divided to about 200 patients with HIV and AIDS. About half his time is spent seeing patients either in person or via telemedicine.

“I couldn’t do this without telemedicine,” Mr. McCroskey says.

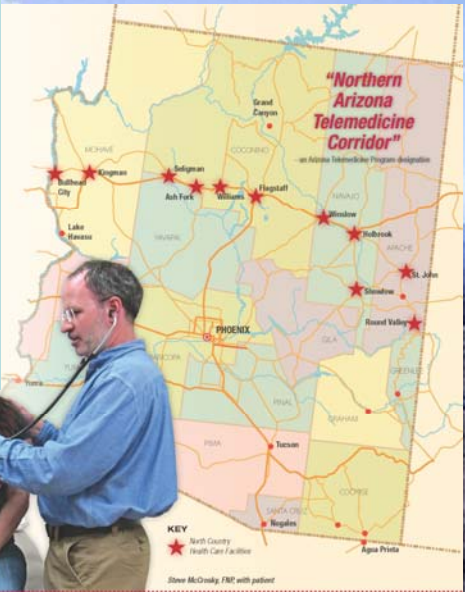
He credits his patients, Christopher Estabill, a member of the Laguna tribe of western New Mexico, born in Winslow, the weeks he took to him to his Winslow clinic, where he can have a virtual visit with Mr. McCroskey, or a face-to-face visit on the two days a year Mr. McCroskey visits the clinic. Mr. Estabill’s other option is driving 60 miles to Flagstaff.

Another of Mr. McCroskey’s patients, who wants to be anonymous, was infected with HIV from a transfusion about 30 years ago.

“I wish my patient like the feeling that they were cared for like that,” Mr. Sorenson says. “We couldn’t have asked for anything more. It’s a great win.”

“Yes, telemedicine did feel weird at first. But it works. You get used to it. I think it’s the wave of the future.”

Patient



© 2017 ARIZONA TELEMEDICINE PROGRAM

Teledermatology



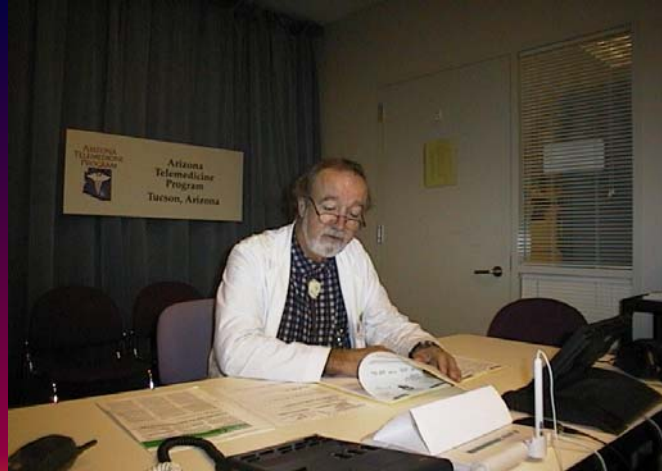
© 2017 ARIZONA TELEMEDICINE PROGRAM

Teleophthalmology



© 2017 ARIZONA TELEMEDICINE PROGRAM

Infectious Disease



© 2017 ARIZONA TELEMEDICINE PROGRAM

Telemedicine Services

Telepresence

Preparedness

© 2017 ARIZONA TELEMEDICINE PROGRAM



Rep. Giffords Shot in Tucson, Saturday, January 8, 2011

Gifford Incident

Saturday, January 8, 2011

- Tucson Shooting of Rep. Gabrielle Gifford
- 6 Dead
- 12 Wounded
- Level I Trauma Center at University Medical Center in Tucson

Pre-Transfer Clinical Video Conferencing

University of Arizona and University of Texas



© 2017 ARIZONA TELEMEDICINE PROGRAM



© 2017 ARIZONA TELEMEDICINE PROGRAM





Chronic Disease Management

© 2017 ARIZONA TELEMEDICINE PROGRAM



advice

**Arizona Diabetes
Virtual Center of Excellence**

© 2017 ARIZONA TELEMEDICINE PROGRAM

Diabetes Classes to Amado via POTS (phone lines)



Sopori Elementary School
Amado

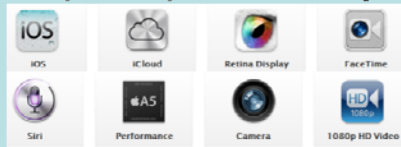


St. Elizabeth of Hungary Clinic
Tucson

© 2017 ARIZONA TELEMEDICINE PROGRAM

Diabetes Monitoring

- **8 Megapixel Camera (60% more pixels than previous iPhone)**
- **New advanced optic lens to enhance shape and light**
- **Face detection**
- **1080p Video Recording**
- **IOS5**
- **SIRI voice activation**
- **Dual core chip – more power, less battery usage**



© 2017 ARIZONA TELEMEDICINE PROGRAM

The screenshot shows the 'Public SECTION' of the National Center for PTSD website. The main heading is 'Mobile App: PTSD Coach'. A sub-heading reads 'PTSD Coach mobile app wins FCC award for helping people use technology to manage PTSD symptoms.' Below this, a paragraph states: 'The PTSD Coach app can help you learn about and manage symptoms that commonly occur after trauma. Features include:'. A bulleted list follows: 'Reliable information on PTSD and treatments that work.', 'Tools for screening and tracking your symptoms.', 'Convenient, easy-to-use skills to help you handle stress symptoms.', 'Direct links to support and help.', and 'Always with you when you need it.' To the right of the text is an image of the PTSD Coach app on a smartphone. Below the text is a 'Download the mobile app' section with links for 'Free PTSD Coach download from: iTunes (iOS)* and Google Play (Android)*'. On the left side of the page, there is a navigation menu for the National Center for PTSD, including sections for 'PUBLIC', 'PROFESSIONAL', and 'ABOUT US'. On the right side, there are social media sharing options, a search bar for the PTSD site, and a banner for 'FACE' (Facing Adversity, Changing Everything).

The screenshot shows the PTSD Coach mobile app interface on a smartphone. The status bar at the top shows the time as 3:46 PM. The app title is 'PTSD Coach'. Below the title is a navigation bar with five icons: Home, Learn, Assess, Manage, and Find Support. The main content area is divided into four large, square buttons with icons and text: 'Learn' (with a gear icon), 'Self Assessment' (with a red arrow icon), 'Manage Symptoms' (with a wrench icon), and 'Find Support' (with a person climbing a rock icon). At the bottom of the screen is a 'Setup' button.

Strategic Planning

© 2017 ARIZONA TELEMEDICINE PROGRAM

Sustainability Issues

- “Meaningful use”
- Reimbursement
- Credentialing
- Interstate medical licensure
- Telecommunications costs
- Equipment obsolescence

© 2017 ARIZONA TELEMEDICINE PROGRAM

The screenshot shows the NEJM website interface. The article title "Virtual Visits — Confronting the Challenges of Telemedicine" is highlighted with a red box. The article text is also highlighted with a red box. The text discusses the evolution of telemedicine from a niche service to a mainstream mode of care, highlighting challenges such as reimbursement, patient engagement, and the need for infrastructure and training. It also mentions the potential for telemedicine to reduce costs and improve access to care, particularly in underserved areas.

Virtual Visits — Confronting the Challenges of Telemedicine
Jeremy M. Kahn, M.D.

Traditionally defined, telemedicine is the provision of medical care remotely by means of audiovisual technology. Using such technology, clinicians can examine patients and make treatment recommendations across long distances. Telemedicine is by no means a new concept — metrics such as telecardiology and telepathology that rely on "store-and-forward" techniques, in which images are captured and sent to a distant location for later evaluation, have been around for more than 30 years. But technological advances including high-resolution video cameras and stable broadband Internet have helped make real-time telemedicine an increasingly common mode of health care delivery in such diverse fields as dermatology, neurology, and intensive care. The fact that in 2012 nearly half of U.S. hospitals reported having active telemedicine programs indicates that telemedicine is now fully within the mainstream.

This dramatic expansion has profound implications for the health care system. Most important, telemedicine has the potential to substantially expand access to high-quality health care, overcoming not only geographic but also socioeconomic barriers to care. Just as neurologists can use telemedicine to treat a patient for stroke in the emergency department of a far-off rural hospital, primary care physicians can use it to treat nearby patients who have difficulty visiting a clinic, such as nursing home residents or patients with disabilities. In all these cases, telemedicine does more than just enable health care delivery across distances; it facilitates a kind of continuity-based care, improving access by making health care more convenient for both patients and providers.

Telemedicine also has the potential to substantially reduce health care costs. For providers, using telemedicine may be more efficient than seeing patients in brick-and-mortar offices, since it reduces the time and space needed to run a medical practice. For patients, telemedicine can reduce travel expenses and the opportunity costs associated with obtaining care, such as missed hours of work. For payers, it has the potential to reduce reimbursement because of reductions in overall utilization. For example, in the emergency-department setting, telemedicine may allow specialists in regional referral centers to remotely treat acutely ill patients with complex conditions in rural hospitals, saving the costs of transport and a second emergency-department visit.

Despite the many ways in which telemedicine may transform health care for the better, it faces a number of major challenges along the way. First, there are ongoing concerns about its effectiveness and cost effectiveness. The aforementioned benefits are theoretical, and the actual data to date are far from convincing. Most studies of telemedicine are methodologically weak. Randomized-control studies that rarely examine patient-centered outcomes, instead focusing on feasibility and acceptability to patients. Although these aspects are important, they are not the same as — and may not correlate with — patients' overall outcomes such as mortality and functional status. Given these limitations, the existing literature does not solve the issue of whether telemedicine delivers the same outcomes as face-to-face encounters at either the same or lower costs.

Second, even in areas where effectiveness data are available, the influence of telemedicine varies greatly depending on where and how the technology is applied. For example, studies have shown that intensive care unit (ICU) telemedicine

2015 Telehealth Issues & Opportunities

New drivers creating need for virtual care models
(ACO, PPACA, etc.)

Physicians shortages – and increased numbers of
patients entering the system

Consumer demands for more convenient health care
services (mHealth)

Large scale commercialization of telemedicine services

➤ New Waves of Corporate Players

➤ **CVS Health - Minute Clinics**

➤ **Walgreens - Walk-in-clinics**

➤ **United Healthcare –PCP Networks**

© 2017 ARIZONA TELEMEDICINE PROGRAM

The screenshot shows a news article on the mobihealthnews website. The article title is "UnitedHealthcare now covers Doctor On Demand, American Well video visits too". The article text states that UnitedHealthcare has announced it will now cover video visits from Doctor on Demand, American Well's AnWell, and its own Optum's NowClinic. It notes that the average price of a video visit is less than \$50 and that members will still be responsible for a portion of that fee. The article also mentions a shortage of 45,000 primary care physicians in rural areas. A screenshot of a mobile app interface is shown, displaying a provider profile for Jennifer Marshall, a Family Physician, with a "Select Provider" button and a "Hello" message.



Phoenix, June 2016 – Service Provider Showcase
Sponsored by the Arizona Telemedicine Program

Telemedicine & Telehealth Service Provider Showcase (SPS)
June 2016

SAVE THE DATE!

Telemedicine Telehealth
Service Provider Showcases
ADVANCING TELEHEALTH PARTNERSHIPS
SPS Returns
June 2016
PHOENIX, AZ

Join us for SPS 2016!
Find out more at www.tlspaperworld.com
sps@telemedicine.arizona.edu • 1.877.535.6166
Exhibiting space and sponsorships are available.

Arizona Telemedicine Program TRC



Thank you

Ronald S. Weinstein, MD

rweinstein@telemedicine.arizona.edu

© 2017 ARIZONA TELEMEDICINE PROGRAM