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A Telemedicine Pioneer Shares Two Decades of Advances and Surprises

by Karen Davis, MD and Mark Simon

At 72 years old, Dr. Earl W. Ferguson is far more than a cardiologist. Hailing from the fairly isolated desert community of Ridgecrest, California (surrounded by four distinct mountain ranges), Dr. Ferguson is a telemedicine pioneer. He is a retired US Air Force Colonel, was a member of the Federal Senior Executive Service with NASA and served as Executive Director of the Southern Sierra Telehealth Network that now performs more than 300 telemedicine visits a month. At Ridgecrest Regional Hospital, Dr. Ferguson is a healthcare executive and preventive medicine specialist with a major interest in telemedicine.

As Earl tells it, he got his first dose of telemedicine in 1992; became seriously involved in 1993; and by 1994 he was a self-identified “believer.” Back in 1994, the Internet was poised to be the next big thing, but the average clinician had little access to this technology. Earl and his colleagues could see a pathway to new possibilities. As an initial project, in 1994 they designed their own web-based medical record system and began to envision a growing array of telemedicine applications.

Since those founding years, Dr. Ferguson has actively witnessed the evolution of telemedicine as we know it. Based upon his growing commitment to this emerging technology, Earl sought a more remote community where telemedicine might make a critical difference. He moved out to Ridgecrest in 1996 specifically to develop rural telemedicine solutions.

As Dr. Ferguson recollects, in the early years of remote specialty visits, telemedicine sessions were conducted over unreliable connections that could drop clients mid-visit. As broadband became widely available, Internet delivery grew more stable and sessions became fully reliable. In more recent years, virtual visits are being conducted in real-time using robust high definition video.

By 2000, Dr. Ferguson began applying his knowledge and experience to support the communities of California’s expansive high desert territory and remote Highway 395 corridor. He has collaborated with providers to transform the standard of care and establish unprecedented access to medical specialists for patients in Bishop, Death Valley, Lake Isabella, Lone Pine, Mammoth Lakes, Shoshone and Tehachapi.



In Lone Pine – a town of roughly 4,000 people – the Southern Inyo Health District operates a four-bed primary care clinic. A limited number of doctors work staggered schedules, while physician assistants and nurse practitioners are the primary round-the-clock clinical staff on site. Several years ago Southern Inyo began utilizing telemedicine to deliver cardiology and dermatology

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visits. Now plans are in the works for virtual visits in psychiatry, dietetics, chronic pain management and counseling.

Lone Pine was the first community in which Dr. Ferguson noticed a surprising impact of telemedicine: When a clinic commits to offer specialty care via telemedicine, the number of visits rises steadily through the first year as patients experience satisfaction and the word spreads; then the number of telemedicine visits begin to decline. Rather than reflecting patient dissatisfaction, this trend results from the vast growth in knowledge and experience of physician assistants and nurse practitioners. As these clinicians attend virtual visits beside their patients, they glean key diagnostic skills from cardiologists, psychiatrists, endocrinologists, dermatologists and oncologists. Practitioners become aware of the specific dangers of multiple medications and other relatively straightforward and common complications. As a result, telemedicine visits decline because patients are increasingly able to rely on local providers who have become experts in the routine elements of specialty care.

Different challenges exist for the frontier community of Death Valley. While home to only 440 permanent residents, this highly remote National Park receives 1.5 millions visitors annually. The park is at least two hours from nearest hospital or medical facility. When a visitor feels the early symptoms of a heart attack the only option is to put them in a park service emergency vehicle, then switch to a different ambulance half way to the hospital. As a result, many people dangerously opt to wait until they return home. With access to robust broadband and a dependable telemedicine system, park staff can make a rapid assessment to determine the best option: Let visitors wait until they are home; seek initial care within the park; or call for immediate emergency transportation. Telemedicine can determine when that two hour ambulance ride is a real lifesaver.

Dr. Ferguson's eyes sparkle a bit as he describes today's cutting edge technology. With reliable broadband, he can use a digital stethoscope and hear a cardiac patient's heartbeat as though they were in the same room, even while they are miles away. There are now Remote Intelligent Telehealth Assistant (RITA) robots that can rapidly diagnose with very high accuracy whether someone is nearing a heart attack.

But at the same time, he warns that we are coming up against an ever-growing digital divide. For those of us in metropolitan areas we might worry whether our wireless connection is 4G or only 3G. In contrast, those in remote locations are fortunate to have any wireless access. There is a high correlation between lack of access to broadband and impeded quality of care.

Dr. Ferguson worries that this divide is only worsening as technology becomes integral to medical care as we know it. He advises that we need to listen to ample stories of those whose lives have been dramatically affected by the technology. We need to humanize telemedicine so that patients, providers and policymakers recognize the opportunity. Now in his third decade in telemedicine, Dr. Ferguson counsels that while we may have a lot of catching up to do, the chance to expand healthcare access to underserved California is well within our grasp.