



TELEMEDICINE: A PUBLIC HEALTH TOOL?

Written by Colleen McGrath and Graceann Palmarella, MPH with consultation from Sara Solomon, MPH RD

TELEMEDICINE

Telemedicine is “the use of information and communications technology to provide health care services to individuals who are some distance from the health care provider¹.” Others define it as “remote electronic clinical consultation².” Telemedicine has been around since the 1950s, with one of its first applications in psychiatry². Today, the use of telemedicine is multifaceted, with applications in rural and community-based settings, as well as the global context³. More importantly, modern telemedicine has been revolutionized by factors such as the Internet and the smartphone. Because it allows health care providers to connect with individuals at a distance (i.e. electronic referrals, video consultations, and patient self-monitoring via smart

phone), it addresses health inequalities by improving both the efficiency and access of health care delivery, even to the most remote populations⁴. Simply put, telemedicine has the potential to bring the highest level of care to the greatest number of people⁵.

GLOBAL AND RURAL PUBLIC HEALTH IMPLICATIONS

Telemedicine is helping advance health for most vulnerable, isolated and/or scattered populations that typically have poor access to health services⁶. Rural populations, in particular, are often too distanced from health care providers and specialists to receive adequate care⁷. In addition, health care providers located in rural areas are distanced from many specialists themselves.

“Patients can also find access to healthcare difficult in urban settings, due to poor insurance coverage, lack of patient mobility, social issues, and/or comorbid illnesses,” says Dr. Kovarik, CPHI Fellow and Associate Professor at the University of Pennsylvania.

Telemedicine provides the opportunity for providers or patients to effectively consult with specialists, or receive expert advice without the usual regard to time of day or local availability⁸.

Similar to rural settings, telemedicine advances health globally in the context of developing countries, as it allows for international communication and information exchange between physicians and specialists⁷. Telemedicine is a system that acts to “help isolated or scattered populations gain access to health services⁶.”

Photos: Dr Carrie Kovarik and colleague Dr. Casey Carlos in Lima, Peru teaching dermatology colleagues about teledermatology (left) and consulting on patients in the Es Salud hospital (right)



THE BOTSWANA UPENN PARTNERSHIP TELEDERMATOLOGY/TELEMEDICINE PROGRAM

In 2007, Dr. Carrie Kovarik, Associate Professor of Dermatology, Dermatopathology, and Infectious Diseases at the University of Pennsylvania, launched the Botswana UPenn Partnership (BUP) teledermatology program⁹. Since its beginning, the program has transformed to one focused more broadly on telemedicine as a whole, while still incorporating elements devoted to teledermatology. Through the program, Dr. Kovarik seeks to address issues relating to poor Information Technology (IT) infrastructure and to a lack of healthcare workers and medical specialists. The program uses cell phones with digital cameras and other tools to transmit health information to educate, diagnose, and treat, linking medical centers in sub-Saharan Africa involved in treatment of skin diseases, especially HIV - related cutaneous disorders.

Current initiatives of the BUP teledermatology/telemedicine program include access to specialty care with mobile oral telemedicine, mobile eye screenings, Albino patient health screenings, and organizing educational programs.

PENN MEDICINE CONNECTED CARE

The Penn Medicine Connected Care telemedicine programs span beyond the Botswana UPenn Partnership Teledermatology/Telemedicine Program to serve a wide variety of patient populations. The programs are using the latest advances in technology to help patients and providers access Penn Medicine specialty care without having to travel to Philadelphia⁵. Programs include:

Penn E-lert eICU: intensive care unit with a proactive approach to patient care

Penn E-lert[®] Home Telehealth: offers high-risk cardiac patients the ability to receive and actively participate in their care using advanced technology from the comfort of their own home

Penn E-lert[®] TeleOB: provides treatment and monitoring for high-risk pregnant women via web-based technology by OB providers

Teledermatology: web-based consultations, evaluation and care for those with dermatological conditions

Telegenetics: genetic testing and counseling services for patients at risk for cancer via videoconferencing

Teleophthalmology: web-based evaluation and care for the treatment of ophthalmologic conditions

Teleradiology: web-based consultation and interpretation for a variety of diagnostic tests such as PET and CT scans

Telesleep: services provide employees at risk for sleep-related problems with clinical screening and appropriate treatment

Telestroke: gives stroke patients access to life-saving care when time matters most, even outside of our health care facilities

Veterans Telehealth: allows veterans to connect with a therapist for mental health for an appointment over a smartphone, on a computer, or even on a tablet with video capabilities

Way to Health: mobile technology to help patients across the nation focus on drug and device compliance and usage

ABOUT CPHI

The Center for Public Health Initiatives was founded in 2007 by the University of Pennsylvania to act as an interdisciplinary public health center that brings together faculty, staff, and students from across Penn's campus. The mission of CPHI is to educate and train new and emerging public health leaders, foster multi-disciplinary collaborations, and promote excellence in public health research and community partnerships.

ANATOMY CHEMISTRY BUILDING,
ROOM 148
3620 HAMILTON WALK
PHILADELPHIA, PA 19104
CPHI.UPENN.EDU
T: 215-746-3467
F: 215-573:9025
@CPHIatUPenn

REFERENCES

- [1] Roine, Risto, Arto Ohinmaa, and David Hailey. "Assessing Telemedicine: A Systematic Review of the Literature." *Canadian Medicine Association Journal* 165, no. 6 (September 18, 2001): 765-71.
- [2] Perednia, Douglas, and Ace Allen. "Telemedicine Technology and Clinical Applications." *Journal of the American Medical Association* 273, no. 6 (February 8, 1995): 483-88.
- [3] Martinez, Andres, Scott Phillips, Emanuel Carrilho, Samuel Thomas III, Hayat Sindi, and George Whitesides. "Simple Telemedicine for Developing Regions: Camera Phones and Paper-Based Microfluidic Devices for Real-Time, Off-Site Diagnosis." *Analytical Chemistry* 80, no. 10 (May 15, 2008).
- [4] Mair, Frances, and Pamela Whitten. "Systematic Review of Studies of Patient Satisfaction with Telemedicine." *British Medical Journal* 320 (June 3, 2000): 1517-520.
- [5] Penn Medicine Connected Care Program. <https://www.pennmedicine.org/for-patients-and-visitors/find-a-program-or-service/penn-connected-care>
- [6] Martinez, Andres, Valentin Villarroel, Joaquin Seoane, and Francisco Del Pozo. "Rural Telemedicine for Primary Healthcare in Developing Countries." *IEEE Technology and Society Magazine*, 2004, 13-22.
- [7] Smith, A., M. Bensink, N. Armfield, J. Stillman, and L. Caffrey. "Telemedicine and Rural Health Care Applications." *Journal of Postgraduate Medicine* 51, no. 4 (2005): 286-93.
- [8] Zawada Jr., Edward, Patricia Herr, Deanna Larson, Robert Fromm, David Kapaska, and David Erickson. "Impact of an Intensive Care Unit Telemedicine Program on a Rural Health Care System." *Journal of Postgraduate Medicine* 121, no. 3 (May 2009): 160-70.
- [9] <https://www.med.upenn.edu/globalhealth/telemedicine-for-skin-diseases.html>