

**Compendium for Telemedicine for South Carolina:
Addressing Healthcare Needs in Rural and Underserved Communities**

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Prepared by graduate students enrolled in the Department of Health Services Policy & Management at the Arnold School of Public Health, University of South Carolina, for partial completion of the course, "Rural Health Perspectives."

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I. Plenary Address

Ronald S. Weinstein, M.D
Founding Director
Arizona Telemedicine Program
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Overview of Program. Dr. Weinstein began by showing a short video highlighting the practice of Telemedicine in Arizona (ATM) and providing background information on the program. Founded in 1996 with 1.2 million dollars in funding from the Arizona Legislature, the original program was set up as a demonstration project and housed at the University of Arizona, School of Medical. Since that time, the program has evolved to serve 61 subspecialties and in 2008 the program had 250,000 cases. There are 4 regional hubs providing clinical specialty services from a variety of member providers. Radiology, dermatology, and psychiatry are the most common specialties provided through the network. Programs in pediatrics, neonatal critical care and nursing are also provided. Continuing health care education programs are broadcast via ATM as well. The network has logged 15,000+ hours of CME/CE in areas including: medicine, surgery, psychiatry, nursing, public health and health informatics.

Barriers to Telemedicine Implementation. Dr. Weinstein proceeded to discuss several initial barriers and events pertinent to the program. In 1996 the Western Governors Association which issued a report noting several barriers to telemedicine including:

- infrastructure, planning and development;
- telecommunications regulation;
- reimbursement issues,
- licensing and credentialing;
- medial malpractice; and
- confidentiality.

Additionally, several attempts by Arizona Governors' appropriates for telecommunications capacity had failed.

Facilitators for Telemedicine Implementation. Two key events allowed the program to gain traction. First, the Arizona Corporate Commission decreased the cost of phone lines in Phoenix which lead to the expansion of telecommunications hardware into the rural parts of the state. Second, legislation stating that all prisoners had the right to subspecialty care while incarcerated was enacted. Given most prisons were located in rural areas of the state; compliance under normal circumstances would be difficult. The combination of events helped create an environment in which telemedicine was needed and could thrive.

Key Components for Telemedicine Programs. Dr. Weinstein then provided more detailed information on how the program organized and operated to develop the ATM program. The founders of the program identified key components necessary for a comprehensive Telemedicine program that included:

- infrastructure,
- services,
- assessment, and
- education.

1. Program Governance - To move the program forward the Arizona Telemedicine Council was established to govern the program and given non-statutory overarching authority. Although housed at the University of Arizona, the program wanted to maintain some autonomy. On the council was an elected official who provided some legitimacy to the program and direct links back to Arizona policy makers. The Council laid out a four part strategy to move telemedicine forward.

2. Regional Telecommunications Strategy - The first priority was to develop a regional telecommunications strategy for telemedicine. Logistics surrounding the expansion of telecommunications hardware provided an initial barrier that had to be addressed. There were limited T-1 lines running to the rural areas of the state, areas that would be the primary beneficiaries of a telemedicine program. With the telecommunications industry highly regulated and competitive, the program found it difficult to expand hardware capacity at the rate necessary for an effective and efficient program. As a solution, the program decided to start a utility company. In doing so, the program could ensure telecommunications networks would be in place where appropriate and increase efficiency by removing the dependence of existing telecommunications companies. The program utilized engineers and other faculty from the University to configure the system and build the infrastructure.

3. Business Plan - According to Dr. Weinstein, the business plan should be:

- tied to public policy,
- be profitable, and
- bring people to together for a higher purpose.

Potential customers of the program were considered when deciding on an appropriate business model. The program identified the core components necessary for a successful telemedicine program:

- strategic planning,
- facilities design and management,
- authority management,
- practice administration,
- health care services,
- risk management and malpractice,
- network operations,
- financials and business,
- legal and regulatory,
- inter-institutional relationships,
- governmental affairs,
- marketing and
- public relations.

The Council decided on a membership based Application Service Provider Enterprise business plan which included 5 layers: (1) client, (2) professional services, (3) operations service, (4) infrastructure services, and (5) vendor layer. Sites wishing to participate in telemedicine from across the state agreed to pay a membership fee

of \$5,000 per year. The telemedicine program selects the equipment, owns the network and operates with an open model; if you pay to join you can benefit from the program. To date there are approximately 170 sites which include Native American Health Care on reservations, prisons, jails, rural hospitals, community health centers, schools, and various other institutions. It was noted by Dr. Weinstein the retention rate for those signed up for the program is 98%.

Critical to the sustainability of the telemedicine program is the availability of third party reimbursement for services provided over the network. Medicaid set the precedent for payment of selected services such as telemedicine. With Medicaid reimbursing for such services in Arizona, other third party payer sources such as Medicare, HMO's, Fee-For-Service providers, and the Department of Corrections also reimbursed for services provided through telemedicine. Dr. Weinstein noted 47 third party payers in Arizona currently reimburse for telemedicine services.

4. Telemedicine Training Program - The Arizona Telemedicine Program's Training Center provides instruction in:

1. clinical applications,
2. telecommunications infrastructure development and operations,
3. medical legal issues,
4. distance education, and
5. administrative aspects of running a store-and-forward and/or real time telehealth program.

5. Telemedicine Standards - The Arizona Telemedicine Technology Assessment Center was established. The Center:

- serves as application clearinghouse,
- oversees facility designs and vendor selection,
- sets standard operating procedures,
- establishes clinical best practice protocols, and c
- conducts basic and clinical research.

It was noted by Dr. Weinstein that all telemedicine facilities are well branded looking exactly the same and have the standard capital equipment, down to the color of the walls and lab coats worn by staff.

Examples of Successful Telemedicine Implementation. Dr. Weinstein proceeded to provide examples of how telemedicine has been successful in Arizona. He noted the use of telemedicine in trauma and emergency care management; noting the availability of telemedicine services has prevented unnecessary transfers of patients and improved the quality of care provided in remote emergency rooms. Examples were also provided related to school telenursing and the hosting a Virtual Center of Excellence for Diabetes management that allows children to learn about diabetes and diabetes management.

One of the more poignant examples provided revolves was that of the Telemedicine Enabled Rapid Breast Care Services. Patients were being lost following mammography and biopsy and a telemedicine program was devised to provide comprehensive follow-up care giving the patient mammography and biopsy results as

well as pathologic diagnosis on the same day. Dr. Weinstein noted that bundling services provided to patients supports the concept of customer driven health care.

Keys to Success. The presentation concluded with Dr. Weinstein providing some keys to the success of the Arizona Telemedicine Program.

1. The program had an entrepreneurial spirit. The program was innovative, not off the shelf, and served as a business incubator.
2. The Arizona program had a champion of stature advocating on behalf of the program in the form of an elected official. The importance of the presence of this person can not be understated. Having an elected official legitimized the program and provided direct ties to policy makers.

II. South Carolina Telemedicine Needs Assessment

Amy B. Martin, Dr.P.H.
SC Rural Health Research Center
Arnold School of Public Health
University of South Carolina

Overview. Dr. Martin provided an overview of the SC Rural Health Research Center and the work they did on the statewide Telemedicine Needs Assessment

Methods. Dr. Martin described the survey development process for rural primary care providers, rural hospital CEOs and their medical directors, as well as the subspecialists. Input was obtained from Dr. Garr, Health and Human Services, and Nancy Connolly-Brown. The survey was administered via the mail using addresses provided through licensure files from the Office of Research and Statistics.

Results

Overall Response. 26% (339) of rural primary care providers (PCPs), which included physicians, advance practice nurses, and physician assistants responded to the survey. All of the rural hospital CEO/medical director and 17% (227) of select specialists responded. Specialties surveyed included cardiology, dermatology, gastroenterology, neurology, psychiatry/psychology, and rheumatology were included. Dr. Martin also stated that numerous telephone calls were made to her office by physicians expressing interest on developing telemedicine partnerships.

Patients' Need for Specialty Care. Rural PCPs and hospitals reported large numbers of their patients needing cardiology, dermatology, gastroenterology, mental health, and orthopedics more than once per week.

Travel for Specialty Care. Large numbers of rural PCPs and hospitals reported their patients had to travel more than 30 miles to access dermatology, neurology, pulmonology, rheumatology, neurosurgery, and vascular surgery.

Providers' Telemedicine Knowledge. Hospital leaders appeared to be more knowledgeable than PCPs, although the distribution was a bell-shaped curve.

Telemedicine Education Needs. The majority of respondents stated they wanted more education on the legal parameters, billing, and the coordination of telemedicine services with specialty providers. Many others reported training needs on selecting/purchasing equipment and data storage, management, and sharing.

Telemedicine Implementation Plans. The overwhelming majority of PCPs and specialists reported they are not considering telemedicine at this time. One in four hospitals stated the same with more than half saying they are considering, but not planning

Telemedicine Infrastructure and Capacity. Rural hospital leaders and PCPs expressed concerns about their physical space, environment, patient privacy safeguards, electrical outlets, and data disaster recovery systems. Most believed their facilities to be inadequate in these areas for the support of telemedicine.

Use of Telemedicine Equipment. Only a handful of respondents indicated they are currently using telemedicine equipment for administration, continuing education, consultation, and emergencies. Hospitals were the biggest users.

Summary

Dr. Martin concluded by making the following points:

- Most rural providers reported a need to improve access to specialty care for their patients.
- Most respondents identified distance and travel as barriers to accessing specialty care.
- The overwhelming majority are not planning for telemedicine adoption.
- Unfortunately, most respondents do not believe their facilities are inadequate to support telemedicine.
- Many specialist would like rural provider partners for telemedicine implementation.

III. Panel I – Statewide Telemedicine: Understanding the Mission, Opportunities, and Challenges for a Statewide Telemedicine Program.

Panel Members:

- Emma Forkner, M.P.A., director of the South Carolina Department of Health and Human Service
- Richard Lindrooth, Ph.D., director of the Medical University of South Carolina Center for Health Economics
- Dr. Ronald S. Weinstein, M.D., director of the Arizona Telemedicine Program
- Nancy E. Brown-Connolly, R.N., M.S., Ph.D., clinical consultant to the U.S. Army Telemedicine and Advanced Technology Research Center
- Raymond S. Greenberg M.D., Ph. D., President of the Medical University of South Carolina (Moderator)

Emma Forkner, Director, S.C Dept. of Health and Human Services

Benefits of Telemedicine. Ms. Forkner provided perspective by discussing how telemedicine is merely taking technology that we use everyday and applying it to medicine. Inserting this technology into rural areas of South Carolina is a great way to account for the lack of specialists in these areas. Ms. Forkner shared anecdotes from her military career to explain how telemedicine can be beneficial for health care in isolated, rural areas. She offered the key to successful telemedicine implementation is to “keep it simple.”

Ms. Forkner’s also shared how her military experiences with telemedicine fostered bonds with army medics serving in Bosnia. The medics in combat zones were able to take pictures of the trauma and send them back to field hospitals via small satellite dishes. Army physicians were able to determine whether the medics were capable of handling the care or if the soldier needed further care. The implications are similar for rural providers when provided with comparable specialty partners.

Dental Applications. Ms. Forkner explained that her first experience with telemedicine came while she was stationed in Alaska. Kodiak Island, Alaska had a small military presence and even smaller provider presence. There were no dentists on the island and one dental technician. Whenever an individual needed more than a dental cleaning, he or she was forced to fly to Anchorage. On one specific occasion, an individual came into the office with a dental problem and the technician was unable to decide what the problem was. The technician decided to take a digital picture of the tooth and sent it via the internet to a dentist in Anchorage.

Mental Health Applications. Ms. Forkner talked about the sizable movement in the mental health community to adopt telepsychiatry, which is an innovative approach for managing the large number of psychiatric patients that are overwhelming the emergency rooms, especially in rural South Carolina.

Considerations for Telemedicine Planning. Ms. Forkner stated that these experiences led to three things that she believes are important when considering approaches to starting a telemedicine program.

1. Space - Where can you put the equipment? Telemedicine requires an allocation of space within the healthcare facility.

2. Technical Support - This is important for set-up, trouble-shooting, and maintenance of the equipment. Given its technical nature, experts and funding are vital.
3. Integration of Telemedicine into Healthcare Systems. Resistance to change must be addressed.

Ms. Forkner closed by stating that the Medicaid program for South Carolina is, in fact, reimbursing for telemedicine.

Richard Lindrooth, Ph.D, Center for Health Economics and Policy Studies, MUSC

Dr. Lindrooth presented a meta-evaluation of telemedicine literature that answers the question, “ is telemedicine worth the cost?” Components embedded in the question are:

- Definitions of the various perspectives of cost,
- Evaluations of the benefits of the cost or cost savings, and
- Measurements of the incremental costs, or the costs that would not have otherwise been incurred.

Patient Perspectives. When looking at the patient’s perspective, the first is reduced transportation costs. Dr. Lindrooth stated transportation costs are the easiest to measure and integrally valuable to the patient. Often transportation costs alone justify the program for the patient. Dr. Lindrooth found in his literature review that the reduction in transportation costs alone can justify the telemedicine program. Additionally, Dr. Lindrooth found that telemedicine can reduce unnecessary hospitalizations, which has multiple benefits, including better health outcomes, a more productive workforce, and an increased quality of life.

Health System Perspectives. Treatment costs were explained using a hub and spoke model. Multiple treatment locations report back to a single center or hospital. The main costs include internet access, monitors, optical devices, and incremental costs that vary by specialty. Administrative and overhead costs are also present and include the maintenance of the system, power, and line charges.

Dr. Lindrooth presented how several practice types have benefited from telemedicine. These include psychiatry, dermatology, radiology, neurology, and cardiology and have been identified as reducing costs, and are rapidly growing in the telemedicine spectrum.

Sustainability. Adoption and sustainability of telemedicine in the state requires several actions to occur. Spokes need to be reimbursed by Medicaid, which was previously stated by Ms. Forkner. Participation by private payers is also crucial, which currently does not occur in South Carolina. Finally, infrastructure for telemedicine needs to be established, which was similarly stated by Dr. Weinstein.

Would South Carolina benefit from telemedicine? Currently, there is not a demand for the services, but the answer to this question depends on the specialty and location of the practice. South Carolina has a rural population of 35% with 24% living in poverty. 33% of the population has one vehicle and 7% does not have a vehicle at all. Data suggests that telemedicine would be useful in meeting access demands for South Carolina’s rural residents.

Ronald S. Weinstein, M.D., Director, Arizona Telemedicine Program

Prescription for Successful Telemedicine Implementation. Telemedicine implementation is an evolution requiring different types of team members: the facilitator, the consultant, champion/leader, and the planning group.

1. Facilitator– A telemedicine program needs someone to create momentum, otherwise called the “facilitator.” The facilitator needs to be some who is respected, preferably a high profile individual that can showcase telemedicine within the state’s body politic. It would help if that individual is a popular politician or respected, well-known individual from the state.
2. Consultant - The second necessary component is obtaining one or more consultants. Based on his experience, Dr. Weinstein believes it is important to look to a consultant when developing a telemedicine program. He stated that “running a telemedicine program is like running an organization where everybody’s hair is on fire,” so it is crucial to have a consultant with experience in the nuances of such an operation.
3. Champion/Leader - The third essential constituent is recruiting a good leader. By leader, Dr. Weinstein suggests that a telemedicine “champion” is needed to lead the process. The individual needs to have vision, political acumen, high energy, strong leadership traits, and most importantly, complete buy-in to telemedicine.
4. Planning Group- The fourth and final component is planning. It is vital to create a planning group that can move the process from start up to implementation. The planning group should establish the goals, set the priorities, and develop strategies to get the program from start to finish. It is necessary for this group to meet regularly in order to make sure that they are meeting deadlines.

Evaluation – Dr. Weinstein recommended telemedicine programs be monitored from the very beginning. They must meet the needs of the patients and their outcomes. Monitoring user satisfaction, provider satisfaction, and clinical outcomes, as well as demonstrating cost effectiveness are critical measures of success. Long-term strategic plans are crucial. The plan will change over time, but the fundamentals will remain the same.

Nancy E. Brown, R.N., M.S., Ph.D., Clinical Consultant to the US Army Medical Research Materiel Command

The focus for Ms. Brown-Connelly’s presentation was the keys to success for telemedicine in South Carolina. She began by stating healthcare is experiencing a technological revolution. Not only is technology expanding for the types of services provided, but also the way they are provided.

Goal and Applications of Telemedicine. Ms. Brown stated that the primary goal of telemedicine is the equalization of access by removing time and distance barriers to the patient. This can lead to improved efficiency and quality of care. She discussed examples of how telemedicine is being used all over the world. She provided a brief history of how it was first used in remote locations, such as battlefields and frontier areas. She also provided examples of how hospitals are taking advantage of it and its use in homes, schools, businesses, and disaster areas.

Challenges. In Ms. Brown’s experience, there are a number of challenges that can impede a state’s progress with telemedicine implementation.

1. Licensure is a state’s rights issue and varies state to state.
2. Many healthcare providers are resistant to telemedicine due to malpractice issues, although there is little evidence to substantiate this concern.
3. Reimbursement is a barrier because many third party payers are hesitant about reimbursing telemedicine practices. Some states have mandated that telemedicine be reimbursed.

Telemedicine Future in South Carolina. The current opportunity for expansion is very good. With the passing of the stimulus package, there are millions in grants for health information technology including electronic medical records. Ms. Brown stated that while telemedicine can be effective in South Carolina, it should not be considered as a replacement for the conventional healthcare team. Telemedicine could “broaden the reach” of healthcare for rural or isolated patients.

Response from Summit Attendees

A question asked at the conclusion of Panel I:

“What is the best way to frame the savings of telemedicine when searching for legislative support?”

- Ms. Forkner stated that the person should stress that this could provide access for constituents and keep costs under control over time.
- Dr. Lindrooth explained that telemedicine creates economies of scale and also stressed that private participation is critical to the success of the program.
- Dr. Weinstein suggested the importance of third party payer participation and how to get them “on board.” He stated that they should be told that they are paying for it, and given the option of how they would like to pay for it.

IV. Luncheon Speaker

Herrmann Spetzler, M.A., Executive Director, Open Door Community Health Network, Eureka, CA

Overview of Open Door Community Health Network. Mr. Spetzler talked mainly about his Open Door Community Health Network and the work they have done with Telemedicine. The Open Door Community Health Centers exist to provide health care and education to residents of Humboldt and Del Norte Counties and surrounding rural areas. Through example, education, and participation in the health care community, Open Door seeks to promote the development of a health care system which meets the needs and enhances the health of all the individuals in their communities.

The Open Door Community Health Centers actively seek out areas of special need and provide high quality health care and health education to those persons without access to care, due to financial, geographical, or social barriers.

Open Door Community Health Centers provide the finest in health care for the entire family. They offer a Family Practice, Pediatrics, Prenatal and Birth Services, Geriatrics, Urgent and Same Day Care, STD testing and Counseling, Alternative Medicine, Immunizations, Women's Health, Family Planning, Complete Dental Care, Mental Health Counseling, Nutritional Counseling, Health Education, and Smoking Cessation. In thirty years this health network has expanded to nine locations. Open Door Community Health Centers have been a pioneer in the development of Telemedicine in rural California.

Keys to Telemedicine Success. Mr. Spetzler talked about Telemedicine and how it is a "three legged stool." He stated there are three elements that an organization needs in order for Telemedicine to succeed:

- technology,
- policy makers and or decision makers, and
- resources such as money.

He also brought up the fact that Community Health Centers have funding that is needed for Telemedicine. There will be one billion dollars available for infrastructure allocated over the next nine months from the stimulus package, and this is a great opportunity for centers to invest money in Telemedicine.

Lessons Learned. Some past errors in Telemedicine have helped paved the way for Mr. Spetzler's current Health Centers. Mr. Spetzler expected telemedicine to be its own entity, rather than an integrated tool, in the beginning of his experience. His organization created the environment needed for telemedicine to work, including the television, camera, and doctors who worked four hour shifts. Even though all the elements were in place, there was much dissatisfaction with his startup system. The outpatient part of healthcare tends to have a high no show rate, and this lead to doctors not having all

their patients showing up for appointments. The doctors became bored. This problem led Mr. Spetzler to consider an integrated system where 80% of the practice's patients were walk-in and the other 20% of the practice's patients were Telemedicine patients. The result was a better utilization of the physician staff.

Cost is a major issue for those looking to progress into telemedicine. The main issue is with cost containment (specifically low costs for equipment, staffing and connectivity). As Mr. Spetzler stated, costs are between \$2,500 and \$4,000 for a telemedicine package, including the necessary televisions and web cameras. It was also interesting that he brought up the idea of technology being ahead of politics, that there are more political barriers than there are technological and financial barriers. He believed we needed to have more access for publicly funded institutions, and a goal of "Hub today, Office tomorrow." He felt that we have to change how we pay for healthcare and we need a bigger workforce. But how do we keep projects going? Spetzler stated that programs should partner with Rural Health Clinics and Community Health Clinics and should use vehicles already in place in order to get reimbursements.

Relevance of Telemedicine. Many people ask Mr. Spetzler, "Why use Telemedicine?" He says there are three main reasons:

- It provides access to specialty care for a large, diverse area. Mr. Spetzler talked of a young child who visited a Telemedicine Clinic in Northern California. The child needed a specialty service seven hours away in San Francisco. The problem is the cost to travel would cost the child's parents three days worth of work to pay for the travel expenses and doctor visit. Telemedicine helps to cut these travel costs and time spent traveling by having the child virtually visit his specialty doctor.
- It establishes a healthcare infrastructure which is a foundation for a healthy economy.
- It establishes an infrastructure, it allows growth of the healthcare industry and brings good paying jobs with benefits to communities.

Future of Telemedicine. The future requires telemedicine to be put into practice. People have voted for \$50 billion to go to medical schools to make Telemedicine part of every medical students' curriculum. Telemedicine is going to be made necessary for all graduation physicians starting in 2011. Telemedicine is a part of the healthcare industry's future.

Benefits of Telemedicine. Mr. Spetzler addressed several benefits of telemedicine to patients and their communities.

1. Economic benefits – Mr. Spetzler touched on the fact that telemedicine is useful in that it retains local resources. Millions of healthcare dollars are being exported in the United States, and a small retention of healthcare money is a big economic consequence. Telemedicine helps to bring in money to rural areas. Rural areas want their customers to be larger cities and to

attract doctors such as orthopedics from larger cities to partner with rural clinics. Telemedicine helps doctors who prefer to stay in the larger cities reach out virtually to rural patients.

2. Cost Savings to the System – Mr. Spetzler stated that telemedicine provides a different quality of life for more rural residents and it is a much more sustainable cost system. This type of practice only needs about four doctors to run, and they can partner with specialty groups within a one hundred mile radius area. Another benefit is that physicians are able to simply buy excess capacity from other medical practices. If a neurologist is working 30% of his available work hours at his clinic but has 70% of his time open because of lack of patients, then Telemedicine can provide more patients to fill up this gap.
3. Health Professions Recruitment & Retention - Telemedicine is seen as a vehicle of resource retention and better local health care. Small business creation brings doctors to towns, and many doctors are migrating from urban to more rural settings. Retiring doctors can work from home through the Telemedicine system and if you pick a location, area doctors can help you build a practice there.

There are many educational linkages to rural providers including the following: Education/CME's participation, Distance Learning and Teleconferencing; plus many sites still remain open. This equipment also allows distant doctors to attend conferences.

Within workforce development, many practices are looking to expand and can venture into telemedicine. This opportunity offers early and semi-retirement for specialists. Also it is a great option for young, tech-savvy new practitioners, and many new graduates seem to like the technology.

4. Disaster Preparedness – Mr. Spetzler stated that populations will migrate from urban to rural settings weather they face a manmade or natural disaster. Through infrastructure and development, we need to be able to handle the surge capacity and continue in development.

The future of telemedicine is bright, with the hopes of the technology being included in every office. With continuing growth, we can expect virtual home visits and constant online monitoring of patients to be commonplace. Through virtual home health and internet support groups, telemedicine will eventually migrate into our homes.

In closing, Spetzler asked the room, why not LEAD rather than FOLLOW?

And, Why not NOW instead of LATER?

V. Panel II – The Community Health Perspective: Opportunities and Challenges for Telemedicine - Improving Access and Healthcare Quality

Panel Members:

- Ralph Riley, MD, Rural Family Physician, Past President of the South Carolina Rural Health Association
- Lathan Woodard, Chief Executive Officer, South Carolina Primary Healthcare Association
- Rick Foster, M.D., Senior Vice President for Quality and Patient Safety, South Carolina Hospital Association
- Herrmann Spetzler, Executive Director, Open Door Community Health Network, Eureka, CA
- Harris Pastides, PhD, President, University of South Carolina (Moderator)

Family Medicine Perspective

Dr. Ralph Riley, M.D., *Family Practitioner* of Riley Family Practice

Family medicine plays a major role in rural community healthcare. Therefore, family medicine can benefit from Telemedicine. Dr. Ralph Riley, a rural family physician and former President of the South Carolina Rural Health Association, gave a presentation based on the family medicine perspective. Throughout his presentation, three rhetorical questions were asked and then answered. He baited the audience with the following questions: “Where is family medicine?” “Where is family medicine going?” and “How can Telemedicine help?” Each question will be addressed according to Dr. Riley’s perspective.

Where is family medicine currently? As of now, family medicine (a.k.a. the primary care system) is struggling. According to Dr. Riley, the demands and expectations of primary health care are steadily increasing. This is more evident in rural areas. Statistically speaking, there is one physician that coordinates with 229 other physicians and 117 different practices.

Additionally, there are concerns with workforce issues dealing with manpower. Presently, there are more women working in the area of primary health care. Because of the demands of family life, they tend to work fewer hours. This creates a shortage of readily available physicians to meet demands. Lastly, there is less production due to increased requirements on time for the coordination of care. These problems overall places a strain on the practice of family medicine.

Where is family medicine going? Family medicine is evolving into Patient Centered Medical Homes (PCMH). Physicians and healthcare executives believe that Patient Centered Medical Homes are needed within rural communities because of residents’ lack of resources; primarily transportation. This leads into the importance of having Patient Centered Medical Home (PCMH). Some features of a PCMH are:

- personal physician- In a PCMH, personal physicians are trained to provide primary contact and comprehensive care. Therefore, an ongoing relationship can be created between the patients and personal physician.
- physician directed medical practice- In a PCMH, this means that a multi-disciplinary team is involved.

- whole person orientation- The PCMH will focus on one whole person's personal and medical history and life circumstances.
- coordinated and integrated care- This is done to eliminate inadequately organized care, which produces mediocre outcomes.
- quality and safety initiative- This includes information technology and continuous quality improvement.
- enhanced access- Currently most patients have physicians, but may not have access. Therefore PCMH's can schedule group visits and provide open access scheduling as a few solutions.
- payment reform- Payment may include a variety of fees for service, additional bonuses for meeting quality and performance goals, and monthly fees for chronic disease management.

Because family medicine is moving toward creating PCMH's, they have received cooperation from Internal Medicine, Pediatrics, The American Osteopathic Association (AOA), and The Committee for Quality Assurance.

How can Telemedicine help? The implementation of Telemedicine can be beneficial to family medicine in many ways. Telemedicine can possibly create integrated care, improve quality and performance goals at a minimum cost, and make communication easier. It is also important to highlight that the specific family medicine areas of which telemedicine can cause a tremendous impact are: psychiatry, endocrinology, and nephrology.

The Community Perspective of Telemedicine

Ms. Lathran Woodard, *Chief Executive Officer* of South Carolina Primary Health Care Association

Ms. Woodard began her presentation by highlighting data from other health centers (HC) in South Carolina and gave statistics on the number of HCs in the nation, as well. In all, there were a total of six topics pertaining to Community Health Centers (CHCs) and telemedicine. These topics are: general information, 2007 data of CHC users, payment source, providers, opportunities and challenges. The first four are related to the former and the last two are related to Telemedicine.

2007 Data of CHC users - There are 300,000 total CHC users in 2007. A pie chart was presented to look at the percentages of adults, children and elderly patients. The largest group, adults, comprised of 164,000 patients; making up 53.6%. Children, the second largest group, had 107,000 individuals and were 37% of the total. At 9.4 % there were approximately 29,000 elderly patients that utilized CHCs. It was observed that 51% of these patients use CHCs as a medical home; providing most of the patients' primary and secondary healthcare needs.

1. **Payment Source** - A pie chart was used to illustrate the percentages of uninsured, Medicaid and private payers. Approximately 38% were uninsured in 2007, or 115,000 CHC users. Among the uninsured, 51% had income under the federal poverty level. Medicaid recipients, made up

31.6% (90,000) of CHC users. Combining the uninsured and Medicaid recipients, there are approximately 62% of CHC patients relying on governmental funds to pay for service.

2. Providers - There are a total of 255 providers in the CHC system, including family practice, obstetrics/gynecology, psychiatry, dentistry, specialists, pediatrics and mid-level.

Opportunities for Telemedicine

Ms. Woodard highlighted three opportunities for telemedicine in South Carolina.

1. Access to specialty care
2. Provider retention
3. Improved health outcomes - Ms. Woodard used her knowledge of rural communities and how patients are affected, health-wise, by a lack of resources. This lack is seen as a transportation scarcity. There are limited public transportation services available in rural South Carolina. Telemedicine is seen as a way to eliminate the transportation barrier by providing on-site, live viewings with physicians in another area. Overcoming this barrier will help with compliance because it will allow patients to be seen from a distant location. Overall, telemedicine can potentially decrease barriers to healthcare, by shortening the traveling distance of a patient, and is seen as an opportunity for rural CHCs.

Challenges

There were three main challenges examined as they relate to telemedicine. These challenges, cost to acquire, cost to maintain, and cost of staff training, are mostly related to money; thus, the use of the term cost. In the end, it is implicitly asked, how will CHC be able to pay for telemedicine when most of its payers are uninsured? To answer this question, each challenge was examined.

Cost to Acquire. The first challenge, cost to acquire, is related to computers. Ms. Woodard made the connection by talking about the cost of hardware, software and connectivity of the providers. These points lead to the questions, where will the hardware and/or software, for Telemedicine, come from and who will install the necessary equipment for connectivity? These questions posed valid to consider when evaluating whether Telemedicine can be implemented in rural CHCs. This first challenge can be viewed as a potential barrier to the process.

Cost to Maintain. The operational cost of telemedicine includes staff support, monthly line cost, equipment and other hidden cost can be costly. Who will pay for this expenditure? If telemedicine can be maintained then the staff will have to be knowledgeable, and be at the cutting edge of technology. This can be done by training and leads into the third challenge, cost of training staff.

Cost to Train Staff. Because of technologies used in telemedicine delivery, Ms. Woodard addressed the cost of staff training as a potential challenge. The training cost was seen to be upfront and ongoing. Therefore it will rely on a continual flow of revenue. Revenue can be quickly generated by seeing patients and the patients pay for the service rendered. However, this is not the case for CHCs. There is an issue with income because most of the patients are Medicaid recipients or uninsured. Therefore, CHCs are primarily reimbursed and it takes a long time to receive payment or no payment is

received at all. The payer mix for CHCs is the underlying factor that could potentially affect the duration of Telemedicine in CHCs. It takes monetary resources to keep a program successful.

Funding. Ms. Woodard asked in closing “where is the money coming from?” From prior data, one could conclude that if majority of the CHC patients are uninsured and on Medicaid, at a combined total of 69.5%, then, most CHC patient are dependent on federal funding for healthcare. However, Ms. Woodard, through inference, answered her own rhetorical question, and challenged the group for the solution. She did so in her final statement, “be the change we wish to see.” Even though she was challenging healthcare leaders, she also included the patients in the term *we*, as well. She stated it will take a “direct buy-in” of all, from healthcare leaders to politicians and even down to the patient, to make it work. This is a community perspective; it will take everyone, even the patient, to be committed to implementing this promising vision. In conclusion, telemedicine will need a community to be successful.

Dr. Richard Foster, Jr., MD, Senior Vice President for Quality & Patient Safety, SC Hospital Association

During this segment of Panel II, Dr. Foster addressed the question, “How do I know if doctors are qualified?” He also focused primarily on two major topics. These two topics were:

- 1) telemedicine literacy, and
- 2) telemedicine credentialing.

The first topic, telemedicine literacy is what should be developed. This begins with the hospital and physician leaders. Telemedicine credentialing is very important, but we need a better way of doing so. This could begin with the provider by letting him tell you what he needs. Information in this type of scenario needs to travel from the bottom up and not top down.

Dr. Herman Spetzler, M.D., Executive Director, Open Door Community Network, Eureka, CA.

Even though, Dr. Spetzler’s insert to the panel was short; it provided an identifiable statistic. He stated that telemedicine can keep practices alive. This was seen in an Obstetric/Gynecological practice in which a physician had to cancel an upwards of a thousand visits due to having to deliver babies at a far away hospital. Once telemedicine was implemented in her area, she was able to keep 80% of her visits. Eight hundred patients are now able to stay compliant and follow up with their Gynecologist. Telemedicine proved to be successful in this story.

Conclusion

At the end of Panel II’s discussion, it was unanimous that Telemedicine could undoubtedly be beneficial to rural communities. Questions addressed were:

- How will it help family medicine?
- How will it be supported by community health centers?
- How will reputation be sustained if used and how telemedicine benefited a doctor?

Either asked or implied, these questions are good in critically assessing the opportunities and challenges of telemedicine in rural communities. Each presenter provided insight, on the Community Health Perspective: Opportunities and Challenges for Telemedicine- Improving Access and Healthcare Quality.

Overall, everyone had different, yet similar messages. One message was that telemedicine will work if everyone worked together. It was stated that it will take a grass roots effort. Through extensive networking of key players and centers, telemedicine can be a thriving accomplishment. Another message that linked presenters together was the need for good communication. It will take communication on all levels. Riley stated that in order for telemedicine to work, “providers should be in the process, from the beginning. The process should be designed from the bottom up than the top down.” Leaders and physicians will need to talk and cooperate. This assertion was coincidentally observed during the question and answer section of the panel. The communication process began in the conference. A small rural hospital CEO stood at the microphone and asked about whether insurance companies will expand benefits to cover telemedicine. A physician executive of Blue Cross Blue Shield was in the audience. This assertive question opened dialogue between the two. They discussed the issue of expansion of benefits as it pertains to telemedicine. No direct solution was made, however there was communication. By the end of the conference, they networked. It may have been the end of the conference, but it marked the beginning.

VI. Panel III – Telemedicine Development and Collaboration: Opportunities for Creating Partnerships and Funding Telemedicine Programs

Panel Members:

- Stan Fowler, Ph.D., Associate Dean for Clinical Research and Special Projects, USC School of Medicine
- Robert Adams, M.D., Director, Medical University of South Carolina Stroke Center
- C. Edgar Spencer, M.Ed., M.S.W., Director of the Duke Endowment Grant, Medical Director's Office, South Carolina Department of Mental Health
- Frank Clark, Ph.D., Vice President for Information Technology and Chief Information Officer, MUSC
- David Garr, M.D., Executive Director, South Carolina AHEC (Moderator)

Dr. Stanley Fowler, University of South Carolina

Previous Lessons Learned. Dr. Fowler discussed previous telemedicine development efforts in South Carolina, which can be traced back to 1994 with Hughes Electronic Telecommunication Company. With that inaugural effort, important lessons were learned that remain germane to current applications.

1. **Funding Partnerships.** In order to start a successful program there is a great need for partnerships to provide funding. Dr. Fowler stated that their telemedicine program received support by the Fullerton Foundation, BellSouth, GTE, and eventually the Duke Endowment.

2. **Reimbursement Barriers.** Dr. Fowler discussed how the federal government was unaware of the telemedicine program, which resulted in reimbursement barriers from government payers. The federal government was initially reluctant to support reimbursement waivers for physicians who use telemedicine, specifically due to interstate rules and regulations. Dr. Fowler explained how he had to reassure the government the practices would remain in the state of South Carolina. In 1995, South Carolina approved the Medicaid waiver, in which increase funding for the program.

Outcomes from Previous Telemedicine Effort. Dr. Fowler identified USC projects that have been influenced by telemedicine, such as:

- telepsychiatry in Lancaster,
- pediatrics telecardiology in Florence to Columbia, and
- vision care in Greeleyville, SC. There are also telemedicine projects for prisoners.
- Prison care –
 - improved access to care,
 - increase public safety,
 - has proven cost saving and
 - are prisoners' preference.
- Currently examining whether telemedicine could be utilized on behavioral therapy (i.e. weight loss), an effort that is grant supported.

Currently, the infrastructure of South Carolina's telemedicine program consists of Greenville Hospital System, University of South Carolina, and the Medical University of South Carolina sites. Fowler concluded his presentation with this statement:

“I think telemedicine is absolutely exhilarating...just simply need to get the right kind of funding for it.”

Dr. Robert Adams, Medical University of South Carolina

Stroke Program Overview. Dr. Adams discussed the specifics of telemedicine in South Carolina in relation to a stroke care program with which he is leading. The program, provided by MUSC, is nationally recognized and certified by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) National Stroke Program. This certification exemplifies MUSC’s commitment to providing the most effective and highest standard of care in relation to stroke treatment, assuring patients and referring physicians that MUSC is the right choice. There are currently five statewide stroke centers in South Carolina. Best practices and performance standards in stroke treatment require that patients receive the FDA approved TPA and they must receive this drug within three hours of onset. With these goals in mind, South Carolina has a growing capacity for telemedicine and the implications are great!

Program Partners. Dr. Adams, and his team, is currently in partnership with Georgetown Memorial and Waccamaw Community hospitals, offering their expertise through web-based consulting.

Scope of Project. With this technology, they are able to provide urgent consultations and assess patients and CAT scans remotely; this collaboration is referred to as the REACH (remote evaluation of acute ischemic stroke) South Carolina Stroke Program. Dr. Adams is the Co-Founder of REACH Call Inc. which provides equipment and technical and decision support for professionals regarding stroke treatment via the web. He has piloted this program in Georgia, and is bringing his knowledge of telemedicine practices and expertise to South Carolina. Dr. Adams stated program is helping patients survive until help arrives. He also discussed how costs for the project can be shared to ensure the success of this program.

Although the current partnership is small in size, MUSC plans to extend this program to numerous other hospitals to help improve stroke treatment in the state of South Carolina!

Dr. C. Edgar Spencer, South Carolina Department of Mental Health

Dr. Spencer is currently the project director of The Duke Endowment (TDE) Grant: Partners in Behavioral Health Emergency Services. He discussed the grant that was received from TDE to develop a telepsychiatry network for all South Carolina (SC) hospitals operating emergency departments (EDs).

Overview of Telepsychiatry Program. The purpose of the grant is to make psychiatric consultation available to all EDs within SC at all times. The development of this project has been accomplished through the partnerships of SC Department of Mental Health, SC Hospital Association, and SC Department of Health and Human Services. Through the consultations there is expected to be an increase in the quality and timeliness of triage and the assessment and initial treatment of patients. The goal of the initiative is to reduce the number of individuals and length of stay in EDs, which will allow hospitals to direct critical personnel and financial resources to other needs. This network it is also expected to bring financial savings to the hospitals.

Description of Equipment. In order to meet the expectations of the program, Dr. Spencer explained that there would be a cart placed in each ED. This cart will be able to be moved from room to

room for the consultations. These carts have their own power source so hospitals will not have to worry about outlets to plug them in. The first cart was placed on Wednesday, February 24, 2009.

Program Benefits. Dr. Spencer stated that there are several benefits of the program.

1. The medical specialties at the different hospitals will be able to talk to each other during these consultations, which can help to coordinate the care that is provided to a patient.
2. There is an automated evaluation form that can be filled by the psychiatrist during the consultation.
3. One thing that Dr. Spencer expressed that he would like to accomplish in the future with this project is to integrate the stroke program that has been developed by Dr. Robert Adams.

With the placement of more and more carts, this telepsychiatry program will be a great accomplishment for South Carolina.

Dr. Frank Clark, Medical University of South Carolina

Dr. Clark spoke about three ongoing initiatives in the state that are examples of the use of telemedicine and can assist in developing a statewide telemedicine program.

Light Rail. In the 2008 fiscal year, there were \$4.5 million allocated to the three research universities to launch this project. The money helped to connect members of Health Sciences South Carolina, which is comprised of the three research universities and their hospitals partners: Palmetto Health, Greenville Health System, and Spartanburg Regional Healthcare System. The contract for this project was awarded to SCANA and is for seven years. This project will allow the transmission time of an X-ray to be cut from 10 minutes to three seconds from MUSC to USC because this network uses light signals instead of electronic signals. The Light Rail system will also enable these institutions to connect with the Lambda Rail, which is a system that joins research institutions across the country.

Palmetto State Providers Network. An \$8 million award was given, with a 15% match, to launch this project. The purpose of the effort is to bring broadband connectivity to providers in rural areas. The network will have a presence in all 46 counties in South Carolina. The contract for this project was awarded to a subsidiary of SCANA. Currently, the state is awaiting FCC approval and a funding letter, which can take about 3-4 months to receive, before the project can be launched.

Charleston Area E-Health Alliance. The purpose of the alliance is to link a group of emergency departments (EDs) together so that the information of any patient that enters an ED at any hospital can be accessed. There has been \$2.4 million to start up the program. A meeting is scheduled for sometime in March to discuss the logistics of this alliance.

VII. Conclusion

The concluding session/discussion portion of the Telemedicine Summit was brief and focused on compliments of the content. The meeting served as a catalyst for creating energy around telemedicine in rural South Carolina.

Suggested Affiliations/Sponsorships /Funding Sources

There was consensus among the speakers, which was validated in a subsequent web search that suggested the importance of considering the following when planning for a telemedicine program:

- the importance of the business plan being tied to public policy and government involvement,
- various health care services offered,
- technology costs,
- resources to provide monetary support, and
- creating a specific network within South Carolina that can be accessed by all participating facilities.

It was stated that establishing affiliations, identifying funding sources, and soliciting sponsorships on state and federal levels are essential for success. Suggested affiliations and sponsorships on a state level include the State Legislature, The Department of Health and Environmental Control, and Colleges & Universities of Medicine, Nursing, Pharmacy and Public Health. Suggested affiliations and sponsorships on the federal level include The Department of Corrections; The National Institutes of Health; and the National Library. The Departments of Agriculture, Commerce, Defense, and Health & Human Services could also be essential affiliations.

Setting Goals for the Telemedicine Program

In the Keys to Success portion of Dr. Weinstein's presentation, he mentioned some keys to the success of the Arizona Telemedicine Program that can be useful for others. While Dr. Weinstein did not have an opportunity to discuss goal setting as a key to success, suggestions can be found at the Arizona Telemedicine Program website at <http://www.telemedicine.arizona.edu/goals.cfm>. In summary from that website, the goals for telemedicine program implementation are:

- "to enhance healthcare delivery to medically-underserved populations throughout the state using telemedicine technologies,"
- "to maintain a statewide Telemedicine Network to increase access to medical specialty services while decreasing healthcare costs,"
- "to use telemedicine outreach programs to encourage physicians, nurses, and other healthcare professionals to establish and retain practices in underserved rural areas,"
- "to provide ongoing training for preceptors, medical students, and residents,"
- "to encourage students from rural communities into the healthcare professions and encourage their return to these communities upon completion of their educations,"
- "to improve public health in rural communities by providing current information and training,
- to have the Arizona Telemedicine Network serve as a test bed to evaluate the effectiveness of state-of-the-art telemedicine services,"
- "to increase and promote the use of telecommunications for distance learning in health care,"
- "to provide health care systems throughout the state with information, training, and expertise in the field of telemedicine," and

- “to evaluate telemedicine equipment and telecommunications options and participate in their development.”

Conclusion

There continues to be successful telemedicine programs all over the United States. These programs include The University of Arizona, University of California at Davis, East Carolina University, the state of Alaska, Georgia Wellmark, and California Blue Cross. Perhaps one day soon, South Carolina will be added to the list of distinguished telemedicine programs. As demonstrated at the recent Telemedicine Summit, our state has remarkable leadership and energy at its universities, state agencies, hospitals, medical practices, and third party payer organizations.

Resources

- South Carolina Hospital Association. Telemedicine for South Carolina Conference: Addressing Healthcare Needs in Rural and Underserved Communities: February 27, 2009. Columbia, SC.
- [http://asclepieion.mpl.uao.gr/pubaspis?Article%20on%Barriers %20to%20Telemedicine%](http://asclepieion.mpl.uao.gr/pubaspis?Article%20on%Barriers%20to%20Telemedicine%20in%20South%20Carolina)
- <http://www.telemedicine.arizona.edu/index.cfm>