

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of:

A National Broadband Plan for Our Future) GN Docket No. 09-51

**Comments of the American Telemedicine Association on
The FCC Notice of Inquiry**

The American Telemedicine Association (ATA) is pleased to provide the following comments regarding the Notice of Inquiry (NOI) regarding the development of a National Broadband Plan. Although the NOI covers many topics and issues we have chosen not to address all of the questions posed. Rather, ATA's comments will address some of the larger issues as well as issues directly pertinent to our field of expertise.

CONTENTS

- 1) Introduction
- 2) Establishing Overall Goals and Benchmarks
- 3) Coordination
- 4) Universal Service Programs
 - a. Rural healthcare pilot program transformation
 - b. Universal service rural health program
- 5) Open Networks
- 6) Ensuring Access
- 7) Affordability and Utilization
- 8) Specific Policy Goals
 - a. Public safety and homeland security
 - b. Healthcare delivery

- Appendix A Recommendations for the FCC rural health pilot program
- Appendix B Outcomes data for telemedicine

1) Introduction

American Telemedicine Association - ATA is a national non-profit association concerned with telemedicine and representing health providers, medical institutions and vendors involved in providing healthcare using telemedicine. For over fifteen years, ATA has promoted the deployment of telemedicine and represented the interests of those involved in its use.

Telemedicine – Telemedicine (also called telehealth) is considered by Congress and the Administration as a core component in current efforts to reform healthcare. It is no wonder. The benefits of telemedicine have been well documented over the past 40 years with a wealth of data about the cost effectiveness and efficacy of many telemedicine applications. Not only does it expand access to health services it has been shown to significantly reduce the cost of healthcare and increase efficiency and effectiveness through such areas as better management of chronic diseases, shared health specialists, reduced patient and

provider travel times, and fewer hospital stays and re-admittances. Scientific studies indicate that the use of telemedicine for such applications as monitoring of chronic care patients or allowing specialists to provide care to patients over a large region have resulted in significantly improved quality of care. And, finally, consumers want it. Patient satisfaction with the use of telemedicine to access care and the use of telecommunications technologies to connect with specialists and other health care providers in order to meet unmet medical needs has consistently been very high.

For the benefits of telemedicine to be fully realized, we must have the ability for patients, consumers, health providers and others to access telecommunications no matter who they are, where they are located, what application is needed or when they need it. This is why a national broadband plan is critical for telemedicine, critical for overall health reform and critical for the future of our nation.

2) Establishing Overall Goals and Benchmarks

Eight years ago, ATA proposed to the Chairman of the FCC the creation of a national health information highway using a grid of networks-of networks across the country. Today, we are close to having such capabilities within our reach. We are excited at the prospect.

The goal of a national broadband policy is “to ensure that all people of the United States have access to broadband capability.” In general, every American should be able to have access to broadband and services that make use of such broadband. This is consistent with ATA’s goal of using telemedicine to make healthcare available to every American wherever and whenever needed. Making broadband telecommunications seamless from sea to sea is a critical element. ATA has long advocated for a national health information highway. However, we have been specific that that such a highway should NOT be separate. Rather, it should be an integral component of a nationwide effort toward ubiquitous broadband services that are available for many applications.

Defining precise broadband goals for the nation has proven elusive. The experience of the past 20 years has taught us that the term “broadband” is a moving target. With each generation of technology, the capabilities and speeds of telecommunications have increased dramatically, often beyond what most could have imagined. Therefore, we believe that the Commission should not lock in a permanent definition of broadband by numerical measure of speed, type of technology used or any complicated technology-based algorithm. Such approaches have the danger of strangling future initiatives with goals that are outdated on the day of issuance. Rather, temporary goals should be used, largely based on end-user data and free of any benchmarks related to the type of use.

The NOI asks several questions about whether a national broadband plan should cover 100 percent of the country and whether the plan should differentiate between the types of services or users of such services. Historically, the demands and need for broadband has been different for institutions and for consumers at home or elsewhere. However, emerging health and educational applications, changing patterns in the workforce, office-free employment arrangements, and mobile services have eliminated the distinction between the needs for a hospital, at a bedside or office, on the road or at home. Indeed, the promise of ubiquitous access to broadband is taking healthcare out of the doctor’s office to the patient at the time and place of need. Therefore, ATA sees no distinction in the need for broadband based on location and suggests that a national goal should be coast-to-coast, border-to-border. Further, the needs for health communication are two-way: doctor-to-patient and patient-to-doctor. Therefore, goals should be specific as to upstream as well as downstream capabilities. Of course, constructing a timetable associated with meeting national goals may need to take into consideration such factors as geographic location, either the price or level of competition.

3) Coordination

ATA has strongly advocated that government agencies take serious and immediate steps to coordinate all programs affecting telemedicine including and telecommunications initiative. The reporting obligations, grant requirements and ultimate goals of the NTIA and RUS programs as well as BDIA and other related federal activities need to be aligned.

Putting such need in context regarding the use of broadband telecommunications for health care, ATA has identified four broad areas of Federal support for telemedicine:

- Reimbursement (Center for Medicare and Medicaid Services, DOD Tricare, Federal Employee Health Benefits Plan, etc.),
- Direct services (Veterans Health Administration, Department of Defense, Bureau of Prisons, Indian Health Service, etc.),
- Regulation (Food and Drug Administration, Federal Communications Commission, Office of the National Coordinator of Health information technology, etc.) and
- Grant support (Department of Commerce, Department of Defense, Federal Communications Commission universal Service Fund, Department of Health and Human Services, United States Department of Agriculture, etc.)

Millions of dollars are spent annually through these programs and thousands of patients are receiving services. Each of these areas can have a profound impact on the shape of telemedicine services. Yet these programs operate without any knowledge of the operations and priorities of the other programs. Independent telecommunications networks are being funded. Separate services are being delivered.

In response, ATA has recommended that the HHS Office of National Coordinator of Health Information Technology establish a formal interagency committee charged with identifying opportunities for synergy, support for uniform approaches and coordination of services will greatly increase efficiency and help each of these agencies better manage and make use of telemedicine technology. Similar coordinative approaches through a national broadband plan would be important.

4) Universal Service Programs

The NOI raises several important questions about universal service. Within the past year, ATA has asked the Commission to make a number of changes in the Rural Health Program and the Rural Health Pilot Program. Recommendations about general policy affecting the rural health and pilot programs and the use of broadband services include:

- a) Rural healthcare pilot program transformation - The development of regional network grids, extending through firewalls and different network architectures to link neighboring telemedicine networks will facilitate a "best practice" model for health care delivery. This is the core of the current rural health pilot program and is a critical component in the national objective of building a healthcare information infrastructure as well as a central component in many proposed approaches to the use of telecommunications for disaster response. The support of such regional network grids using any available broadband network or technology should be permanently incorporated into the rural health program.
- b) Universal service rural health program – The overall design of the core universal service program for rural health needs to be changed.

- i) Health provider access to services including new “on demand” broadband services from alternative carriers should be included. All communications providers should be eligible to participate in the health program.
- ii) The rural-urban disparity in line rates for such broadband services as ISDN is disappearing with the use of alternative technologies but the need for broadband-based health telecommunications remains. The FCC should replace current discounts in rural rates with an across-the-board discount and extend the benefit to all health providers, regardless of location.

ATA has also identified program management issues with the universal service rural health program and made specific recommendations. Although not specifically limited to broadband access, these issues must be addressed in order to move ahead with any national policy affecting the use of broadband for health care. They are included in APPENDIX A.

5) Open Networks

There has been a dramatic emergence of a plethora of health-related and consumer-developed applications for the iPhone and other open platform initiatives. It is important that the nation consider the benefit that open networks may have on expanding access to broadband applications as well as seeding innovation for broadband-based health services. A policy encouraging open markets and open networks should be a hallmark of any national broadband plan.

6) Affordability

As access to health care, health records and health information via telecommunications becomes a cornerstone to the delivery of health care in America, the issue of affordability and access to broadband services becomes even more important. Existing programs such as Lifeline and Link-Up programs should be expanded to enable low income consumers to gain access to broadband as well as basic telephone service.

7) Specific Policy Goals

- a) Public Safety and Homeland Security - Since 9/11/2001 ATA has been engaged in a series of activities aimed at improving the nation’s capabilities to use broadband telecommunications technologies for use in public safety and homeland security. ATA has put forward a series of public policy recommendations:
 - i) *Use of telemedicine* - Immediately after 9-11, a white paper was developed for former FCC Chairman Powell by ATA calling for a nationwide telecommunications network, in order to provide pervasive medical resources for homeland security needs, with the intent to create a seamless, hierarchical network that links health information, medical treatment and public health resources at the local, state, regional and national levels – a national health information highway. Such a network can incorporate many of the 200 telemedicine networks that exist throughout the country, linking over 3,000 medical and public health institutions. Such a system should be incorporated into any national broadband plan.
 - ii) *Strengthening emergency responders’ access to broadband* - Technically, the telecommunications systems used for many public health and medical facilities, while adequate for normal use, may be insufficient during emergencies when bandwidth is at a

premium and demand is high. Current telecommunications systems usually operate on networks that do not facilitate interoperability, especially with proprietary features such as encryption software and peripheral devices. This, in turn, forecloses the kind of seamless communications networks that are desired and needed. Adding to the difficulty is the fact that, during declared emergencies, federal and military agencies and programs often move into an affected region with their own stand-alone and non-interoperable telecommunications systems, compounding the interoperability problem facing the public health and medical communities.

- iii) Network system design - Emergency, medical and public health care facilities should install telecommunications systems that have the ability to increase bandwidth dynamically (immediately or within hours) so that, in the event of a disaster, communications between health facilities will not exceed limits and jeopardize efficient communication. Federal funding for such telecommunications systems should provide for such flexibility. In addition, telecommunications networks and connections used by emergency, medical and public health facilities should all have access to the highest level of priority service within the federally mandated emergency telecommunications services (GETs). This will ensure that bandwidth will be available in a disaster and that redundant communications pathways are maintained.
- iv) Using advanced telecommunication capabilities within existing federal emergency response programs – Federal emergency response agencies and programs such as FEMA, DMAT, and CDC should be directed by the President to incorporate advanced telecommunications capabilities and ensure immediate coordination with local and regional emergency communications capabilities. Federal agencies with emergency response and homeland security responsibilities should coordinate their efforts with the deployment of independent communications networks and share telecommunications facilities and network equipment wherever possible during a declared emergency. DMAT and Medical Reserve Corps teams should have telecommunications-based reach-back capabilities including the technical capacity as well as administrative and clinical protocols and cooperative agreements with centers of specialized healthcare in order to access such expertise when needed.
- v) Inclusion and coordination with telecommunications systems - Public health and healthcare systems must be able to communicate with public safety and emergency response agencies – any federal or state funding for emergency communication systems or equipment should include a requirement to include an interface with public health and healthcare. Further, federal or state funded local emergency response planning and training (such as emergency preparedness drills) should include an understanding of any existing electronic bed and patient tracking systems as well as the development of mechanisms to use such information where appropriate.
- vi) Expanding and integrating emerging threat communications systems – Federal action is needed to better coordinate and expand communications systems focusing on all aspects of threats to the population, immediate and emerging. Public health, hospitals, community health centers, nursing homes, EMS and public safety all have critical roles to play in protecting the American public. Efforts to coordinate existing systems as well as the development of next generation emergency communications system design should be a priority on national, state and local levels. These initiatives must include all players and communication pathways and should allow for mechanisms to engage all players in providing two way communications during times of emergency.

- b) Health Care Delivery - The NOI seeks comment on how to interpret and implement the Congressional requirement to plan for use of broadband infrastructure and services in advancing health care delivery. Of course, this is the overall topic of ATA's current filing. However, in this section, the Commission seeks comment on several areas:
- i) The interaction between broadband development and improved access to medical records and healthcare - Telemedicine and electronic medical records (or electronic health records) are closely related applications of health information technology. Electronic medical records (EMRs) digitize information contained in patient records. Once digitized in an organized and standard format, the data can be used in many ways to improve patient care and better document health care-related patterns. Telehealth uses telecommunications to provide health services from a distance. While not a requirement, the use of EMRs will enable telehealth to operate more efficiently and will reduce medical errors.
 - ii) How improved broadband infrastructure and services can increase the quality of medical care available to unserved and underserved parts of the country through telehealth initiatives - ATA has documented how medical care can be improved through the use of telecommunications and has included a summary of various studies and research initiatives that have documented specific outcome measures of telehealth services in Appendix B.
 - iii) How the FCC can continue to work with HHS and other agencies to maximize the penetration of telehealth initiatives, educate citizens on broadband and telehealth options, and generally use broadband to increase health awareness, diagnosis, and treatment - As mentioned above, ATA has recommended that the HHS Office of National Coordinator of Health Information Technology establish a formal interagency committee charged with identifying opportunities for synergy, support for uniform approaches and coordination of services will greatly increase efficiency and help each of these agencies better manage and make use of telemedicine. The FCC should participate in this effort. Similar coordinative approaches through a national broadband plan would be important.
 - iv) How to consider the availability of open source health information technology systems with respect to the national broadband plan - ATA's goal is to have the spectrum of healthcare be accessible, understandable and seamless for the patient whether traditional medicine or new consumer-based services are being used. In other words: bring healthcare to the consumer wherever and whenever needed. Open source health information technology is becoming an important component in the delivery of healthcare and a national broadband plan should take steps to encourage open source technology. Carriers of broadband services should not restrict access on the basis of proprietary technology.

ATA thanks the Commission for this opportunity to provide input into a National Broadband Plan and stands ready to provide additional information and other assistance in the future.

Jonathan D. Linkous
CEO
American Telemedicine Association

APPENDIX A

Recommendations for the FCC Rural Health Pilot Program

Numerous problems have been raised in the implementation of the program largely due to the poor initial design including the initial review process, program rules and regulations. While subsequent rulings by the Commission have helped to clear up some of the largest problems a review and change in the program structure is needed. In the meantime, a series of issues with approved projects remain.

1. **ISSUE:** Of the 69 projects that were initially approved by the FCC, there appears to be a wide variation among applicants in terms of cost per site and the involvement and participation of health providers in the design and implementation of the program.
RECOMMENDATION: An immediate re-evaluation of the project applications should be made taking under consideration the issues addressed above and those projects found to be wanting requested to address outstanding issues. This review should be accelerated and take no longer than one month so that the projects with sound designs can move forward immediately.
2. **ISSUE:** Prolonged delays in gaining final approval of projects have seriously threatened the success of the program. About 2½ years after announcing the program, few projects have received final approval. Guidance from FCC and USAC staff appears to be arbitrary, conflicting and changing.
RECOMMENDATION: An accelerated effort should be made to release the funds for all projects after completing the brief evaluation process outlines above.
3. **ISSUE:** Despite the complexity of many of the projects, no money was allowed to be allocated for project management, with the exception of direct funding for creation of a network design RFP. At this point most applicants have invested thousands of dollars in preparing for the project without any final approval in sight and with no support for administration once the project is approved.
RECOMMENDATION: The use of federal dollars to support project administration and project management costs needs to be allowed. Allowable expenditures need to include salaries, travel to program facilities/sites, and other expenses of a recurring nature.
4. **ISSUE:** Detailed quarterly progress reports have been required of all 69 selected participants starting in 2007 even while they await final approval and funding to start their project.
RECOMMENDATION: Quarterly progress reports should not be required of selected participants until funding is actually dispensed and the project has started.
5. **ISSUE:** The FCC has ruled that recipients of the pilot program funds can resell excess capacity of their network to others. This is not allowed under the normal rural health program. This, essentially, allows health providers to compete against commercial broadband providers.
RECOMMENDATION: FCC policy should be uniform among all aspects of the rural health program.
6. **ISSUE:** Approved applicant for the to the pilot program have been informed that they are now required to complete a sustainability plan, which must be reviewed and approved prior to the issuing of a final funding commitment letter. ATA is very supportive of requiring program sustainability for any federally funded telemedicine project. Such a requirement should have been incorporated into the original application guidelines provided for the pilot program. Requiring applicants to retroactively develop such a plan and to subject it to a rigorous review process, apparently with benchmark requirements, appears to be unjust to those project applicants that have already received initial approval and have already waited over two years for funding to commence.

RECOMMENDATION: The FCC and USAC should continue to require a sustainability plan and provide ongoing technical assistance to grantees with sustainability issues but should NOT hold up funding while the projects are putting together the plans.

7. ISSUE: The current severe economic decline and the considerable delay in providing a final funding letter have left many project applicants desperate to gain immediate access to the 15% cash match required for their project to proceed. The cash match is on top of the requirement that no funds can be used to support administrative services for the projects.

RECOMMENDATION: There is not legislative requirement for a cash match. The match is not even a requirement of the regular rural health program. The Commission should set aside the match requirement or, at minimum, adopt a more liberal position in accepting in-kind services including administrative services.

APPENDIX B

Telemedicine's Impact on Healthcare Cost and Quality Research Outcomes

Over 40 years of research has yielded a wealth of data about the cost effectiveness and efficacy of many telemedicine applications. PubMed a bibliographic database of medical research that is maintained by the National Library of Medicine includes over 10,000 citations of published works related to telemedicine or telehealth. Over 2,000 evaluative studies related to telemedicine have been published in two journals devoted to telemedicine alone. The summaries that appear highlight the results from a few of the studies that have evaluated the cost effectiveness, quality of care and patient acceptance of telemedicine.

COST EFFECTIVENESS OF TELEMEDICINE

Most of the peer-reviewed research about the cost effectiveness of telemedicine that is based on large sample sizes and follow sound scientific rigor are relatively new, many emerging in the past two years. These studies are consistent in finding that telemedicine saves the patients, providers and payers money when compared with traditional approaches to providing care. Many of these studies assess the cost effectiveness of specific telemedicine applications.

The Value of Provider-to-Provider Telehealth Technologies Center for Information Technology Leadership Partners HealthCare System, Inc, 2007

This study examined several specific telemedicine applications and used a rigorous approach to define both costs and financial benefits to the nationwide implementation of each application.

- For the use of telemedicine to join EMERGENCY ROOMS - the cost to equip all US emergency departments with hybrid telehealth technologies could easily be covered by savings from a reduction in transfers between emergency departments. From a baseline of 2.2 million patients transported each year between emergency departments at a cost of \$1.39 billion in transportation costs, hybrid technologies would avoid 850,000 transports with a cost savings of \$537 million a year.
- For the use of telemedicine in CORRECTIONAL FACILITIES - Correctional facilities could cover their costs of hybrid telehealth equipment by savings from a reduction in transporting patients to emergency departments and to physician offices, and by avoiding the costs of the emergency department visit. From a baseline of 94,180 transports made annually from correctional facilities to emergency departments at a cost of \$158 million in transportation and visit costs, hybrid technologies could avoid almost 40,000 transports with a cost savings of \$60.3 million a year. Further, hybrid technologies could avoid visits to physician offices. From an annual baseline of 691,000 physician office visits at a cost of \$302 million, hybrid technologies could avoid 543,000 inmate transports with a cost savings of \$210 million.
- For the use of telemedicine in NURSING HOMES - the costs of implementing hybrid telehealth equipment in nursing homes could be covered by savings from a reduction in transferring residents to emergency departments and physician offices, and by avoiding the costs of the emergency department visit. From a baseline of 2.7 million transports made annually from nursing facilities to emergency departments at a cost of \$3.62 billion in current transportation and emergency department visit costs, hybrid technologies could avoid 387,000 transports with a cost savings of \$327 million. In addition, of the 10.1 million physician office visits made annually from nursing facilities at a cost of \$1.29 billion for in-person physician office visits and transportation, hybrid technologies could avoid 6.87 million transports with a cost savings of \$479 million.

Care Coordination/Home Telehealth: The Systematic Implementation of Health Informatics, Home Telehealth, and Disease Management to Support the Care of Veteran Patients with Chronic Conditions Adam Darkins,

Patricia Ryan, Rita Kobb, Linda Foster, Ellen Edmonson, Bonnie Wakefield, Anne E. Lancaster *Telemedicine and e-Health*. December 2008, 14(10): 1118-1126.

The Veterans Health Administration (VHA) introduced a national home telehealth program, Care Coordination/Home Telehealth (CCHT), in 2003 to coordinate the care of veteran patients with chronic conditions and avoid their unnecessary admission to long-term institutional care. CCHT patients increased from 2,000 to 31,570 (1,500% growth) between 2003 and 2007. CCHT is now a routine noninstitutional care (NIC) service provided by VHA to support veteran patients with chronic conditions as they age. Routine analysis of data obtained for quality and performance purposes from a cohort of 17,025 CCHT patients shows the benefits of a 25% reduction in numbers of bed days of care, 19% reduction in numbers of hospital admissions, and mean satisfaction score rating of 86% after enrollment into the program. These results demonstrate a dramatic reduction in costs and an equally dramatic increase in quality.

A Systematic Review of the Key Indicators for Assessing Telehomecare Cost-Effectiveness Stephanie Vergara Rojas, Marie-Pierre Gagnon. *Telemedicine and e-Health* November 1, 2008, 14(9): 896-904. doi:10.1089/tmj.2008.0009.

This careful review identified reports on telehomecare published between 1997 and 2007. Of the identified studies, 23 were appropriate for comparison of costs in various ways. Of these, 70% were in the United States, 15 of 23 were randomized control trials, and 48% were published between 2003 and 2007. Teleconsultation was about equal to telemonitoring in the services. Total cost, cost per patient, and cost per visit were all reduced by telehomecare. The report also concluded that standardization of cost outcomes should be implemented in order to help funding agencies better understand the importance of telehomecare.

Economic Impact of eICU Implementation in an Academic Surgical ICU Benjamin A Kohl, Frank D Sites, Jacob T Gutsche, Patrick Kim, Anesthesiology and Critical Care, University of Pennsylvania, Philadelphia, PA Crit Care Med. 2007;35(12):A26.

This study shows an improvement in mortality and length of stay after implementing eICU (VISICU, Baltimore, MD) in a large academic surgical ICU. The purpose of this study was to measure the economic impact of this transition.

Hypothesis: Implementation of eICU in an academic surgical ICU, allowing round-the clock intensivist oversight, will decrease ICU and hospital costs. METHODS: The study retrospectively compared a random sample of 189 patients pre-eICU to 2,622 patients 3 years post eICU using a multiplier of 13.87 to normalize populations. Assumptions based upon published literature include an average surgical ICU cost per day of \$1,500-\$2,000 and an average daily cost on a general floor of \$500-\$600. Because of the disparate sizes in populations a multiplier of 13.87 was used to standardize the numbers. There was no significant change in practice paradigm during the time period. APACHE III scores were used to calculate predicted length of stay in ICU and hospital. RESULTS: An almost 10% reduction in ICU stay and 20% reduction in floor stay occurred after implementation of eICU. This translated into a savings of \$706,272-\$941,697 for the ICU and \$2,134,339-\$2,842,940 for the floor. CONCLUSIONS: Implementation of an eICU in an academic SICU resulted in significantly reduced costs.

Cost-Utility Analysis of Telemedicine and Ophthalmoscopy for Retinopathy of Prematurity Management

Kevin M. Jackson, OD, MPH; Karen E. Scott, MD, MBA; Joshua Graff Zivin, PhD; David A. Bateman, MD; John T. Flynn, MD; Jeremy D. Keenan, MD, MPH; Michael F. Chiang, MD Arch Ophthalmol. 2008; 126(4):493-499. Objective To evaluate the cost-effectiveness of telemedicine and standard ophthalmoscopy for retinopathy of prematurity (ROP) management. METHODS - Models were developed to represent ROP examination and treatment using telemedicine and standard ophthalmoscopy. Cost-utility analysis was performed using decision analysis, evidence-based outcome data from published literature, and present value modeling. Visual outcome data were converted to patient preference-based time trade-off utility values based on published literature. Costs of disease management were determined based on 2006 Medicare reimbursements. Costs per quality-adjusted life year gained by telemedicine and ophthalmoscopy for ROP management were compared. One-way sensitivity analysis was performed on the following variables: discount rate (0%-7%), incidence of treatment-requiring ROP (1%-20%), sensitivity and specificity of ophthalmoscopic diagnosis (75%-100%), percentage of readable telemedicine images (75%-100%), and sensitivity and specificity of telemedicine diagnosis (75%-100%). RESULTS For infants with birth weight less than 1500 g using a 3% discount rate for costs and outcomes, the costs per quality-adjusted life year gained were \$3193 with telemedicine and \$5617 with standard ophthalmoscopy. Sensitivity analysis resulted in ranges of costs per quality-adjusted life year from \$1235 to \$18 898 for telemedicine and from \$2171 to \$27 215 for

ophthalmoscopy. CONCLUSIONS Telemedicine is more cost-effective than standard ophthalmoscopy for ROP management. Both strategies are highly cost-effective compared with other health care interventions.

TELEMEDICINE AND QUALITY OF CARE

Scientific studies in this area indicate that the use of telemedicine for such applications as monitoring of chronic care patients or allowing specialists to provide care to patients over a large region care have resulted in significantly improved care. For most telemedicine applications, studies have shown that there is no difference in the ability of the provider to obtain clinical information, make an accurate diagnosis, and develop a treatment plan that produces the same desired clinical outcomes as compared to in-person care when used appropriately. Here are a few examples.

Home-based telehealth: a review and meta analysis Dellifraire JL, Dansky KH. *J Telemed Telecare*. 2008;14(2):62-6

Department of Health Policy and Administration, The Pennsylvania State University, Pennsylvania 16802, USA. We conducted a systematic review to identify studies on the effect of home telehealth on clinical care outcomes. The search was restricted to peer-reviewed publications (published between 2001 and 2007) about studies conducted in home or residential settings. The search yielded 154 potential articles and dissertations. A total of 29 articles met the inclusion criteria and were included in a meta-analysis. The weighted mean effect size for the overall meta-analysis was 0.50, and the z-statistic was 3.0, indicating that telehealth had a moderate, positive and significant effect ($P < \text{or} = 0.01$) on clinical outcomes. Sub-analyses also indicated positive significant effects of telehealth for some disease categories (heart disease and psychiatric conditions), but not others (diabetes), patient populations and telehealth interventions. Overall, the meta-analysis indicated that telehealth positively affects clinical outcomes of care, even in different patient populations.

Janca, 2000. Telepsychiatry: an update on technology and its implications. *Curr Op in Psych* 13: 591-7.

This study/article concluded that even “early research demonstrated that the psychiatric interview conducted over videoconferencing is reliable for diagnostic assessment and treatment recommendations.” In addition, a retrospective review of medical records comparing clinical outcomes of patients seen by [interactive TV] (IATV) and those in-person showed no significant difference found in the percentage of change in Global Assessment of Functioning (GAF) between the two groups suggesting clinical outcomes were not affected by the use of IATV.

Young TL, Ireson C. Effectiveness of school-based telehealth care in urban and rural elementary schools. *Pediatrics*. 2003 Nov;112(5):1088-94.

Telehealth technology was effective in delivering pediatric acute care to children in [these] schools. Pediatric providers, nurses, parents, and children reported primary care school-based telehealth as an acceptable alternative to traditional health care delivery systems.

Leggett PF, Graham L, Steele K, Gilliland A, Stevenson M, O'Reilly D, Wootton R, and Taggart A (Sep 2001) *Telerheumatology: Diagnostic accuracy and acceptability to patient, specialist, and general practitioner. British Journal of General Practice* 51(470) : 746-8.

This study examines the diagnostic accuracy and acceptability of telemedicine in the field of rheumatology. One hundred patients had a telephone and televisual consultation and the results were compared with a face-to-face consultation. While the telephone consultations were often unsatisfactory, the televisual consultations were highly accurate (97%) and acceptable to patients, general practitioners, and specialists.

Jerant AF, Azari R, Martinez C, Nesbitt TS. A randomized trial of telenursing to reduce hospitalization for heart failure: patient-centered outcomes and nursing indicators. *Home Health Care Serv Q*. 2003;22(1):1-20.

Patient self-care adherence, medications, health status, and satisfaction did not significantly differ between groups. Telenursing can reduce CHF hospitalizations and allow increased frequency of communication with patients.

Belmont JM, Mattioli LF. Accuracy of analog telephonic stethoscopy for pediatric telecardiology. *Pediatrics*. 2003 Oct;112(4):780-6

In pediatric patients, a narrow-bandwidth telephonic stethoscope can accurately distinguish between functional and organic murmurs and thus can detect heart disease. Accuracy is greatest when the instrument is used by an experienced examiner with patients at least 5 years of age.

Ermer D.J., 1999. Child and adolescent telepsychiatry clinics. *Psych Services* Jul 29(7): 409-14.

This study concluded that severely disturbed children can be adequately assessed and treated, the range of expressed emotion and the quality of clinical interaction appear similar in TelePsychiatry and [in-person] interactions, and children in crisis can be safely assessed and treated [via telepsychiatry].

Arizona telepsychiatry project gains national attention, patient approval, 1998. *Mental Health Weekly*, Jan 19, 8(3): 4.

Main purpose of the project was to facilitate mental health in the region with the use of telehealth technology – role of simplifying case management and prior authorization. Program instituted by the Northern Arizona Regional Behavioral Health Authority.

Craig J, et. al. 2000. The cost-effectiveness of teleneurology consultations for patients admitted to hospitals without neurologists on site. *Journ of Telemedicine and Telecare* 6 (suppl 1): S1: 46-9.

Comparison of outcomes of patients admitted to two small. One hospital received neurological services by telehealth, the other in-person. Neurological services were provided via Telemedicine. Comparing case-mix, process of management, and outcomes for all patients using ICD-10 codes with a final diagnosis of neurological condition there were no appreciable differences noted between the clinical outcomes and the length of stay between patients receiving services in-person and those who received services via telehealth.

Telemedicine and Diabetes Dimmick et. al. *Telemed Journal and e-Health*, 9(1): 13-23 (2003)

This is a study of patients receiving care over a telemedicine network that linked three hospitals and an FQHC with six sites, a dental clinic, and patient homes. Outcomes from the disease management programs conducted over telemedicine for the diabetes group showed that the diabetes disease management program increased the number of diabetics who brought their blood sugar under control.

PATIENT SATISFACTION WITH TELEMEDICINE

Patient satisfaction with the use of telemedicine to access care and the use of telecommunications technologies to connect with specialists and other health care providers in order to meet unmet medical needs has consistently been very high. Degrees of satisfaction may vary slightly with the specialty accessed through telemedicine, but overall patients have responded well to its use. The source of satisfaction for most patients is the ability to see a specialist trained in the area most closely related to the patient's condition, the feeling of getting personalized care from a provider who has the patient's interest in mind, and the ability to communicate with the provider in a very personal and intimate manner over the telecommunications technologies. Examples appear below.

Gustke, S.S., Balch, D.C., West, V.L., and Rogers, L.O. 2000. Patient satisfaction with telemedicine. *Telemedicine Journal* Spring 6(1): 5-13.

Patient satisfaction was examined in relation to patient age, gender, race, income, education, and insurance. Overall patient satisfaction was found to be 98.3%.

Janca, 2000. Telepsychiatry: an update on technology and its implications. *Curr Op in Psych* 13: 591-7.

In this study, results indicated that “most consumers found that a video link with a psychiatrist moderately or greatly helped them in managing their treatment, with 98% of the preferring to be offered videoconferencing in combination with local services.”

Brodey et al, 2000. Satisfaction of forensic psychiatry patients with remote telepsychiatric evaluation. *Psych Services*: Oct 51(10): 1305-7.

This study indicated that satisfaction did not differ significantly between video and in-person consultations for incarcerated patients.