REPORT OF THE
COUNCIL ON INFORMATION MANAGEMENT

BARRIERS TO THE IMPLEMENTATION OF TELEMEDICINE IN VIRGINIA

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

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COMMONWEALTH of VIRGINIA

COUNCIL ON INFORMATION MANAGEMENT

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The Honorable George Allen
Governor of Virginia
and
The General Assembly of Virginia

Dear Governor Allen and Ladies and Gentlemen:

House Joint Resolution No. 53 (1996) requested the Council on Information Management, as part of the Information Technology Infrastructure Initiative, to evaluate roadblocks to the implementation of telemedicine applications in rural Virginia and recommend legislative or regulatory action.

We are pleased to transmit this report on *Barriers to the Implementation of Telemedicine in Virginia.*

Respectfully submitted,

Hudnall R. Croasdale
Director

Enclosure

BARRIERS TO THE IMPLEMENTATION OF TELEMEDICINE IN VIRGINIA

PREFACE

Authority for Study

House Joint Resolution (HJR) 53 of the 1996 Session of the General Assembly directs the Council on Information Management, as part of the Information Technology Infrastructure Initiative, to evaluate roadblocks to the implementation of telemedicine applications in rural Virginia and recommend legislative or regulatory action.

Work Plan

The Council formed a study committee of experts from the public and private sectors to evaluate roadblocks to the implementation of telemedicine and develop appropriate recommendations to overcome identified roadblocks through policy changes, legislative action or regulatory action. Serving on the Study Committee are:

Jeff Nelson
Department of Medical Assistance Services

Dorothy Boland
Department of Information Technology

Fred Schilling
Department of Corrections

Gary Blankenbecler
Department of Health

Clyde Amburn
Department of Personnel & Training

James B. Montgomery
Central State Hospital

Carol Hampton
Medical College of Virginia, VCU

Dr. Paul Mazmanian
Medical College of Virginia, VCU

Dr. Michael Blank
SW Rural Mental Health Research Center

Dr. Roger A. Hofford
Virginia Academy of Family Physicians

Henry Smith
Cumberland Mountain Community Services Board

Dr. C. Donald Combs
Eastern Virginia Medical School

Dr. James Ghaphery
Virginia Academy of Family Physicians

Dr. Karen Rhueban
University of Virginia

Paul E. Galanti
Medical Society of Virginia

Dr. Alan Wagner
21st Century Care Systems, Inc.

In addition to those serving on the Committee, representatives of additional agencies, institutions and organizations have been invited to attend several of the meetings and give testimony on the issues under discussion. These included:

Ann Colley
State Corporation Commission

William Irby
State Corporation Commission

Margaret Dexter
Department of Rehabilitative Services

Martha Adams
Department of Rehabilitative Services

David Schwemer
Woodrow Wilson Rehabilitation Center

Leslie Hutcheson
Department for the Deaf and Hard of Hearing

Dr. Claudette Dalton
Medical Society of Virginia

Dr. Lawrence Colley
Trigon

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I. EXECUTIVE SUMMARY

Telemedicine is broadly defined as the use of telecommunications technology to deliver health care services and health professions education from a central site to distant areas. For purposes of this study, telemedicine means the practice of health care delivery, diagnosis, consultation, treatment, transfer of medical data and education using "store and forward" systems such as image transfer and interactive audio, video and data communications.

A diverse collection of technologies using telecommunications as a method for health care services delivery, telemedicine systems can be characterized by the type of information sent such as radiographs or clinical findings and by the means used to transmit it.

Current Scope of Telemedicine
Interest in the field of telemedicine has increased dramatically in the 1990s. At least thirteen federal agencies have begun telemedicine research and demonstration programs. Many states are using their own resources to build state-of-the-art telemedicine systems, some with capital investments exceeding $50 million.

Telemedicine is not universally supported. While some view it as a valuable tool for providing specialty care services to under-served areas, others consider it a serious misallocation of increasingly scarce health care dollars.

Approaches to Telemedicine by Other States
The goals for state involvement in telemedicine development include:

- Ensuring equity in access to technology by improving the distribution of telecommunications resources.
- Providing funding for program development.
- Coordinating and facilitating state planning and policy development through a statewide coordinating body.
- Serving as public consensus builder in support of telemedicine and as facilitator in program planning.
- Managing components of program implementation by using state resources and state capabilities.
- Facilitating regulation that supports and enhances telemedicine, specifically related to provider licensure, confidentiality, reimbursement and health insurance regulation, malpractice and credentialing.

Effectiveness of Telemedicine
For patients in rural areas, telemedicine provides access to consultations with specialists as well as the analysis of diagnostic tests rapidly without having to spend the time and money to travel to urban medical centers. However, very little telemedicine is actually being done. The proliferation of telemedicine may depend less on technology and more on the willingness of insurance companies and the federal Health Care Financing Administration to reimburse health care providers for the cost of remote diagnostics and consultation.

While reimbursement is a major factor holding back the growth of telemedicine, other barriers need to be addressed if telemedicine is to become a widely used tool for providing access to health care in rural Virginia. Currently, telemedicine is not widely

practiced in Virginia or the United States due to a number of other barriers, including physician acceptance of new technological tools, licensing and hospital credentialing requirements, as well as legal restrictions and uncertainties, including privacy issues, regulatory barriers and inadequate financing.

Barriers to Telemedicine

At present, the barriers to telemedicine do not reflect inherent limitations in technology that compromise the clinical process but rather societal practices and restrictions. The evolving nature of telemedicine is witnessed by the large number of pilot projects under way. The need exists for further research, less to determine whether telemedicine works, than to determine when and how best to utilize it in the Commonwealth.

Recommendations to address each of the barriers identified in the report were developed by the Telemedicine Study Committee and are as follows:

Reimbursement for Telemedicine Services. To provide a basis for telemedicine reimbursement policy in Virginia, the Legislature should encourage and support universities, public and private payers and other organizations to study the cost effectiveness of telemedicine services.

Telemedicine Acceptance. Research studies and pilot projects should be conducted, both on the need for telemedicine as well as its effect on practice patterns, community hospitals and related issues, which will demonstrate the actual impact of telemedicine on a community.

As a way of overcoming the lack of widespread physician acceptance of telemedicine and the lack of familiarity with related technologies, medical schools and continuing medical education programs should provide telemedicine training in their curricula.

Licensure and Credentialing. The State Board of Medicine should be encouraged to adopt a policy for the practice of telemedicine which will assist in achieving the maximum quality of care for as many citizens of the Commonwealth as possible.

Legal and Medical Malpractice Liability. In the practice of telemedicine, jurisdiction should occur subject to the same laws as currently apply to other forms of medical practice. Once the issue of licensure for the practice of telemedicine is resolved, however, a study may be necessary to determine how resolution of this issue impacts liability.

Confidentiality. The following steps should be taken to ensure the confidentiality of electronic medical records created or associated with the practice of telemedicine:

- Apply existing confidentiality protections, including informed consent where appropriate.
- Implement security in as current a technology as possible.
- Once the issue of licensure for the practice of telemedicine is resolved, a study may be necessary to determine how resolution of this issue impacts privacy.

Telecommunications Regulation. The Legislature and the State Corporation Commission are encouraged to take all actions necessary to ensure compliance with the principles enunciated in the US Telecommunications Act of 1996 and the approved recommendations of the Joint Board.

Cost. The medical community, providers of technology, and communications companies should be encouraged to fund and share the responsibility for establishing needed telemedicine sites and for identifying the most appropriate and cost-effective telemedicine applications.

Infrastructure Planning and Development. Initiatives should be encouraged and supported to ensure the continued growth of cost-effective statewide telecommunications networks capable of delivering maximum health care services to the rural communities.

Telecommunications service providers in the Commonwealth should be encouraged to participate in providing "last mile service" to Virginia's rural communities.

Benefits Discovery. The Department of Health should be requested to coordinate, in conjunction with other agencies, a study and needs assessment to determine the deficiencies existing in health care services in rural Virginia which could be met by telemedicine.

II. INTRODUCTION

As the U.S. Congress debates shifting administrative and fiscal responsibility for a broad range of social service and health care programs to the states, greater attention is being focused on the capabilities and resources of the states to shoulder these additional burdens.[1] Although the thrust of current legislative and policy making activities in Washington has not been on programs such as telemedicine, the shifting of program responsibility and downsizing of federal financial support have direct implications for the future of numerous telemedicine efforts, particularly those aimed at improving health care resources in rural and under-served areas.

Development of telemedicine initiatives has broad appeal throughout the United States. State support for telemedicine is significant and growing. More states are directing attention to overall planning and program development in the hope that health services provided through telecommunications technology will address problems associated with the distribution of primary care and other health care resources.[2]

III. BACKGROUND

Definition of Telemedicine

There is no consensual definition of telemedicine. The term is used to refer to a range of applications that varies in its scope. Telemedicine is broadly defined as the use of telecommunications technology to deliver health care services and health professions education from a central site to distant areas. For purposes of this study, telemedicine means the practice of health care delivery, diagnosis, consultation, treatment, transfer of medical data and education using "store and forward" systems such as image transfer and *interactive* audio, video and data communications.

Telemedicine is a diverse collection of technologies using telecommunications as a method for health care services delivery. Telemedicine systems can be characterized by the type of information sent such as radiographs or clinical findings and by the means used to transmit it.

Telemedicine techniques have been under development for nearly 35 years.[3] Two-way interactive television (IATV) was first employed in 1959 when a microwave link was used for telepsychiatry consultations in Nebraska. In the same year, teleradiology was pioneered in Montreal, Quebec, by transmitting telefluoroscopic examinations over coaxial cable. In the 1970s and 1980s, limited telemedicine projects were instituted at several sites in North America.

Current Scope of Telemedicine

Although interest in telemedicine has waxed and waned in the past, it appears likely that the current emphasis on its use will persist. Interest in the field has increased dramatically in the 1990s. State and federal allocations for telemedicine and related technologies are likely to exceed $100 million in fiscal 1994-95.[4] At least thirteen federal agencies have begun telemedicine research and demonstration programs. Many states are using their own resources to build state-of-the-art telemedicine systems, some with capital investments exceeding $50 million. Support for the technology is not universal, however. While telemedicine is seen by some as a valuable tool for providing badly needed specialty care services to under-served areas and more efficient use of

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[1] Lipson, Linda R., Henderson, Tim M. "State Initiatives to Promote Telemedicine," *Telemedicine Journal* 2(2), 1996 p. 109.

[2] Lipson, Op cit., p. 111.

[3] Perednia, Douglas A. "Telemedicine Technology and Clinical Applications," *JAMA*, 273(6) February 8, 1995,. p. 483.

[4] "Federal programs offer $85 million in grants for telemedicine research," *Telemedicine*, 2, October 10, 1994, pp. 5-

existing medical resources, others view it as a serious misallocation of increasingly scarce health care dollars.

Approaches to Telemedicine By Other States

Typically, states have taken somewhat different roads to developing and implementing policy on telemedicine and supporting program development (Appendix A). No single model can depict state roles and actions in telemedicine. While many state governments have developed telemedicine initiatives specifically to address health care access issues, others have had broader concerns such as economic development, primarily in rural areas, or improved educational access. The goals for state involvement in telemedicine development include:

- Ensuring equity in access to technology by improving the distribution of telecommunications resources.
- Providing funding for program development.
- Coordinating and facilitating state planning and policy development through a statewide coordinating body.
- Serving as public consensus builder in support of telemedicine and as facilitator in program planning.
- Managing components of program implementation by using state resources and state capabilities.
- Facilitating regulation that supports and enhances telemedicine, specifically related to provider licensure, confidentiality, reimbursement and health insurance regulation, malpractice and credentialing.

Effectiveness of Telemedicine

Telemedicine has the potential to dramatically increase the quality of medical care available to communities with few medical resources. For patients in rural areas, it provides access to consultations with specialists as well as the analysis of diagnostic tests rapidly without having to spend the time and money to travel to urban medical centers. Medical and diagnostic software and related information databases are key telemedicine components required to improve health care services in most rural communities.

Nevertheless, very little telemedicine is actually being done. The structure of telemedicine systems is quite variable. In only a few cases does the literature report that there appears to be an interconnected system that could be described as a true network.[5] In most cases, a program consists of a tertiary care hub and one or a few remote sites. Although the literature is too limited to fully support telemedicine as effective, existing research suggests that telemedicine, with some qualifications, is effective and may have significant potential for addressing problems concerning access to care.

The proliferation of telemedicine may depend less on technology and more on the willingness of insurance companies and the federal Health Care Financing Administration to reimburse health care providers for the cost of remote diagnostics and consultation. While reimbursement is a major factor holding back the growth of telemedicine, it is, in fact, not the only barrier. Reimbursement policy needs to be addressed, but it is also apparent that telemedicine is not widely practiced in the United States due to a number of other barriers, including physician acceptance of new technological tools, licensing and hospital credentialing requirements, as well as legal restrictions and uncertainties, including privacy issues, regulatory barriers and inadequate financing.

5 Grigsby, Jim, Schlenker, Robert E. *Analysis of Expansion of Access to Care Through Use of Telemedicine.* Denver, Center for Health Policy Research, 1994, p. 3.3.

IV. BARRIERS TO TELEMEDICINE

Reimbursement for Telemedicine Services

Reimbursement policies adopted by Health Care Financing Administration (HCFA) directly influence state health care programs and exert considerable influence on private insurers. HCFA has not established a national telemedicine coverage policy for Medicaid and, consequently, reimbursement policies for telemedicine services by HCFA, private insurers, and state Medicaid programs are currently limited and inconsistent. Today, most telemedicine systems are supported by state, federal, and private demonstration grants that do not provide stable sources of revenue for long-term viability. The lack of clear and consistent reimbursement policy makes it difficult to cover the costs of telemedicine systems with reliable sources of revenue. Because of this, reimbursement is currently viewed as a barrier to expanding the use of telemedicine.

Telemedicine is becoming available more quickly in the less traditional market segments such as the military, correctional, veterans, Indian Health, and international arenas, where cost containment and access are the drivers and telemedicine technology is seen as an investment that leads to lower cost in the long term. Military telemedicine systems benefit from having an extensive communications network already established. In addition, these systems have not been constrained by licensing and credentialing regulations, HCFA regulations for reimbursement, or profit motives.

Telemedicine applications may also develop more quickly in HMOs operating on a capitated basis within a single state. These organizations have strong incentives to treat patients effectively at their lower-cost clinics rather than at their tertiary care hospitals.

Conclusions. Clearly the issue of reimbursement for telemedicine services is a major factor influencing its use in Virginia. It is also likely that third party payers are waiting for HCFA to establish a policy on reimbursement for telemedicine prior to making their decision about its future role in health care.

The evolving nature of telemedicine is witnessed by the large number of pilot projects under way. It would appear that there is great clinical promise in telemedicine consultation and a great potential benefit to patients and physicians, especially in rural or other isolated areas. However, the need exists for further research, less to determine whether telemedicine works, than to determine when and how best to utilize it in the Commonwealth.

Recommendation(s). To provide a basis for telemedicine reimbursement policy in Virginia, the Legislature should encourage and support universities, public and private payers and other organizations to study the cost effectiveness of telemedicine services.

Telemedicine Acceptance

Telemedicine, with its new and evolving technology, as well as its different way of providing health care services has created barriers within the medical profession and, in some instances, with the patients receiving medical care via telemedicine.

Physician Acceptance. Many physicians are reluctant to become involved in telemedicine. Although the percentage of the physician population sharing this view is difficult to determine, it appears that many share a concern about whether specific aspects of telemedicine have been scientifically validated. In addition, a number of physicians practicing in or competing with evolving models of health care believe that telemedicine will have a negative impact on their practices. Some physicians fear the loss of patients, consulting with other physicians they do not know, altered referral patterns and greater competition for the same patient population.

Studies indicate that most physicians not directly involved in telemedicine programs are unfamiliar with the technology.[6] Their lack of experience and familiarity with the constantly evolving and sometimes cumbersome technology associated with telemedicine creates a barrier that must be overcome before the widespread acceptance and use of telemedicine will happen. Among some physicians, the fear of diminished physician/patient relationships, lack of face to face contact and the quality of the health care services provided have been expressed as potential barriers to the use of telemedicine. Fixed telemedicine facilities, often external to a physician's office, disrupt normal practice routines and can cause inconvenience to the physician if used regularly.

Physicians in rural areas with limited resources tend to respond to the introduction of telemedicine in terms of how it will affect their practice, generally viewing it as advantageous and providing them, and their patients, with access to expertise that is otherwise unavailable. They perceive there may be other benefits as well, such as access to computerized databases, literature searches, opportunities for interaction with colleagues and continuing medical education.

In rural areas that are not severely under-served, the reaction may be somewhat different. In a community with a hospital and 10-20 physicians, practice patterns are generally well established, and a referral network is in place. The intrusion of a telemedicine program may appear to threaten "business-as-usual," and physicians may be concerned about the possible loss of patients and revenue.

Patient Acceptance. A significant amount of research into patient acceptance of telemedicine is currently in progress by HCFA and the private sector. Although not a large number of people have been telemedicine patients, it appears that negative reactions are rare. However, it is valid to assume that reaction to telemedicine-provided services may be significantly determined by the health care market segment that serves them or the characteristics of the practitioners involved in the consultation. Patients tend to believe that the care they receive from physicians is good. Also, those providers currently using telemedicine are generally those who are interested in it and take every measure to ensure their patients are comfortable. As more providers become involved in telemedicine and it becomes more routine, patients' perceptions may change.

Conclusions. Analysis and development of applications should start from the consumer, both the potential patients and the health-care providers who serve them. For development of telemedicine applications, effective partnerships must be established; consumers, local and distant health-care providers, technology providers, and companies that manage communications networks should be involved. The starting point, however, must be the consumer--"what is needed and will be used" are more important issues than "what is technologically possible." In addition, software development should be based on input from the end-user community.

Adequate training is essential for successful implementation of telemedicine. With the wide dissemination of computers and video systems, many people (especially those who are young) are comfortable with the use of telecommunications technologies. Training in the specific applications of new systems is critical, however, if practitioners are to use them.

Telemedicine offers both direct access to traditional continuing medical education (CME) and "instantaneous" CME with every interaction between local and distant health-care providers. In many cases, CME, health care providers are required to travel to regional and national centers for courses and presentations. Telemedicine affords the opportunity for one-way or interactive CME without departure from the practice site. Additionally, each interactive session between the local provider and the distant consultant offers immediate, problem-based CME. In general, learning in this problem-based setting tends to be highly effective and efficient and will contribute to increased quality of care.

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6 Ibid.

Recommendation(s). Research studies and pilot projects should be conducted, both on the need for telemedicine as well as its effect on practice patterns, community hospitals and related issues, which will demonstrate the actual impact of telemedicine on a community.

As a way of overcoming the lack of widespread physician acceptance of telemedicine and the lack of familiarity with related technologies, medical schools and continuing medical education programs should provide telemedicine training in their curricula.

Licensure and Credentialing

The primary purposes of state licensure requirements are to ensure quality health care services and to regulate the commercial activities of individuals that practice the healing arts. Each of the fifty states, the District of Columbia and the United States territories and their respective boards of medical licensure have rules that govern the ability of health care practitioners, including physicians to practice medicine. Three options for licensure to accommodate interstate telemedicine arrangements have been discussed, primarily by professional medical groups:

- Full licensure in each state - where the practice of medicine requires an individual to be fully licensed in a state to practice telemedicine.
- Limited licensure - where exemption from full licensure is accorded for telemedicine practiced across state lines.
- National licensure where the practice of medicine is licensed at the federal rather than the state level.

According to a report (A-96) issued by the American Medical Association's (AMA) Council on Medical Education (CME) and the Council on Medical Service (CMS), Medical Practice Acts developed by individual states share many provisions in common, although each state's law is unique. These laws and regulations have developed in piecemeal fashion, creating a patchwork of laws that can vary significantly.

The Commonwealth of Virginia requires anyone practicing medicine in the State be fully licensed to do so. According to the Code of Virginia § 54.1-2902:

> *It shall be unlawful for any person to practice medicine, osteopathic medicine, chiropractic, podiatry, physical therapy, clinical psychology or as a physical therapist's physician's or podiatrist's assistant in the Commonwealth without a valid unrevoked license issued by the Board of Medicine.*

AMA reports that the Medical Practice Acts of several states (e.g., Idaho, Indiana, New Hampshire, North Carolina, Ohio and Utah) contain exemptions for out-of-state consultations. Still other states (Alaska, Pennsylvania and Tennessee) require that the consultation be at the request of the in-state physician. Some of the states that maintain these statutory consultation exceptions explicitly prohibit the out-of-state physician from opening an office or receiving calls in that state. Other limitations on out-of-state physicians include the regularity, frequency or duration with which the physician may utilize the exemption prior to being required to obtain a full license.

Conclusions. Because of the expected infrequency of practice of medicine across state lines, practitioners are understandably reluctant to use multistate telemedicine networks due to the costs and administrative burdens of complying with multiple censure and credentialing rules. To fully exploit the potential of telemedicine, therefore, there is consensus that telemedicine needs to be more than intrastate and that in considering the issue, emphasis should be placed on providing the maximum quality of care be available to as many people as possible.

Recommendation(s). The State Board of Medicine should be encouraged to adopt a policy for the practice of telemedicine which will assist in achieving the maximum quality of care for as many citizens of the Commonwealth as possible.

Legal and Medical Malpractice Liability

There is significant uncertainty regarding whether malpractice insurance policies cover services provided by telemedicine. Telemedicine networks that cross state lines create additional uncertainties regarding the state where a malpractice lawsuit may be litigated and the law that will be used. Will the lawsuit be heard in the state of the provider, the patient, or in another state covered by the network? Which state's law will govern the case? Choice of venue and choice of law issues can have significant financial implications for the parties to litigation as states differ in the statutory limits placed on the amount of malpractice awards.

There is a need for clear legal definitions of the roles of consultant and responsible provider under telemedicine, and struggles over jurisdiction for licensure are likely. It appears certain that if legislation does not settle questions of liability, case law will eventually do so.

Conclusions. Jurisdictional issues related to malpractice and liability must be examined if telemedicine is to achieve a maximal effect on improved access to health care. Currently, when two or more practitioners cooperatively address a medical problem by using telemedicine, the issue of liability is unclear. This issue should be addressed and resolved.

Recommendation(s). In the practice of telemedicine, jurisdiction should occur subject to the same laws as currently apply to other forms of medical practice. Once the issue of licensure for the practice of telemedicine is resolved, however, a study may be necessary to determine how resolution of this issue impacts liability.

Confidentiality

The privacy of patients' medical records is increasingly a matter of public concern.[7] There are many views on the security of personal information in electronic form. Some believe that replacing personal data on paper with computerized recordkeeping poses an undeniable threat to the traditional confidentiality of physicians' and hospitals' information systems and that electronic patient records are more susceptible to unauthorized access and dissemination than are paper charts on hospital wards.

In 1994, the General Assembly passed House Joint Resolution No. 66 which created a 19-member joint subcommittee to study state and federal law on privacy, confidentiality and mandatory disclosure of information held or used by governmental agencies.[8] It found that medical and mental health records are exempted from the provisions of the Freedom of Information Act. However, specific disclosure statutes which apply both to paper and electronic records include numerous reporting provisions that require the release of medical information to safeguard the health of the patient or public. After reviewing existing law, the subcommittee concluded that present confidentiality and disclosure laws appear to be sufficient.

Confidentiality with respect to medical records should be no more a problem with telemedicine than with other consultative practices. All types of communication, from verbal to full-motion video, provide opportunities for breeches in confidentiality. However, the fact that the states have traditionally regulated individual privacy protection has important implications for interstate telemedicine since privacy laws vary significantly from state to state. Privacy protection across

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7 "Increasing Use of Computerized Recordkeeping Leads to Legislative Proposals for Medical Privacy. JAMA 276(4), July 24/31, 1996. p. 270.

8 Report of the Joint Subcommittee Studying State and Federal Law on Privacy, Confidentiality, and Mandatory Disclosure of Information Held or Used by Governmental Agencies (House Document 65). Commonwealth of Virginia, 1996. pp 7-11.

interstate networks and distributed medical databases is, therefore, only as strong as the weakest law in a given state.

It is asserted by some that to deal realistically with the issue of privacy of medical records requires a strong federal statue that would preempt state laws. This assertion is controversial since many state laws, such as those of Virginia, already protect a wide variety of medical records.

In the case of electronic records, privacy is often confused with security. In 1994, a report by the National Academy of Sciences noted that the privacy issue has very little to do with unauthorized access. A more logical concern may be with authorized access which may be so prevalent as to preclude or prevent controlling disclosure of sensitive medical information.

Conclusions. Patients wary of electronic data may be reluctant to use telemedicine systems that result in the creation or transmission of confidential information. Physicians and other health care practitioners with these perceptions may be reluctant to use electronic systems which they believe may increase the risk of breaching patient confidentiality.

The patchwork of state laws regulating privacy poses an immediate challenge to telemedicine. Although the debate over strengthening individual privacy would have occurred without the advent of telemedicine, it serves to intensify that debate.

Recommendation(s). The following steps should be taken to ensure the confidentiality of electronic medical records created or associated with the practice of telemedicine:

- **Apply existing confidentiality protections, including informed consent where appropriate.**
- **Implement security in as current a technology as possible.**
- **Once the issue of licensure for the practice of telemedicine is resolved, a study may be necessary to determine how resolution of this issue impacts privacy.**

Telecommunications Regulation

Limited competition for telecommunications services in rural areas and regulatory distortions created by arbitrary boundaries, such as Local Access and Transport Areas (LATAs), result in prohibitively high costs for transmission services needed to support high bandwidth applications like interactive video. In many rural communities, prices for intra-LATA calls are unusually high and there is no local access to the Internet.

State laws governing utility regulatory commissions include prohibitions on discrimination through rates or services between similarly-situated customers. These rules do not permit incentive prices for telemedicine users and result in unnecessarily high telecommunications costs.

The U.S. Telecommunications Act of 1996 directs the Federal-State Universal Service Joint Board to adopt new universal service support mechanisms to advance the universal service principles enumerated in the Act. The principles enunciated in the Act are as follows:

- Quality services should be available at just, reasonable and affordable rates;

- Access to advanced telecommunications and information services should be provided in all regions of the Nation;

- Consumers in all regions of the Nation, including low-income consumers and those in rural, insular and high cost areas, should have access to telecommunications and information services, including interexchange services and advanced telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are

available at rates that are reasonably comparable to rates charged for similar services in urban areas;

- All providers of telecommunications services should make an equitable and nondiscriminatory contribution to the preservation and advancement of universal service;
- There should be specific, predictable and sufficient Federal and State mechanisms to reserve and advance universal service; and
- Elementary and secondary schools and classrooms, health care providers and libraries, should have access to advanced telecommunications services.

On November 7, 1996, the Federal-State Joint Board took the first major step to realize the mandate for universal service set forth in the Telecommunications Act of 1996. The Joint Board's recommendations are designed to ensure that affordable quality telecommunications services are available to all consumers, including low-income consumers, in all regions of the Nation. In addition, the Act requires that all eligible schools, libraries, and rural health care providers receive telecommunications services at a discount.

The Joint Board estimates that approximately 9,600 health care providers in rural areas in the United States will be eligible to receive telecommunications services supported by the universal service mechanism. Health care providers include teaching hospitals, medical schools, community health centers, migrant health centers, mental health centers, not-for-profit hospitals, local health departments, rural health clinics and consortia or associations of any of the listed providers.

The November 7 recommendations from the Joint Board did not include any discount recommendations for rural health care providers similar to those provided for schools and libraries (a minimum of 20% and a range from 40-90% discount). However, the Joint Board recommended that the Federal Communications Commission seek further information before designating the exact scope of services to be supported for rural health care providers. The Joint Board also recommended that the FCC seek further cost information on the cost to rural health care providers of Internet access and infrastructure development needed to bring to rural health care providers telecommunications services available to urban health care providers.

The Joint Board also recommended that universal service support mechanisms for schools, libraries, and rural health care providers be funded by assessing both the intrastate and interstate revenues of providers of interstate telecommunications services.

The Federal Communications Commission is expected to take formal action on the recommendations of the Federal-State Joint Board by May 1997. Final actions by the FCC will have far reaching implications on the regulatory environment in Virginia.

Conclusions. Communications technology and availability can be very poor and a limiting factor in rural, and even urban, under-served areas. In certain areas of the United States, even telephone service is not routinely available--because of such factors as minimal economic resources or actual absence of telephone lines. If advanced telecommunications technology is to assist these regions, equal attention must be given to basic resources.

Recommendation(s). The Legislature and the State Corporation Commission are encouraged to take all actions necessary to ensure compliance with the principles enunciated in the US Telecommunications Act of 1996 and the approved recommendations of the Joint Board.

Cost

Telemedicine can significantly enhance the availability of medical care to people who currently do not have adequate access and can decrease the individual cost of care. Although costs of equipment are decreasing, starting a telemedicine program nevertheless remains a relatively expensive venture. Policy makers are concerned that the increased access to care will significantly increase the overall costs of health care for private insurers and Medicare.

The ability of a practitioner or organization to obtain sufficient funding for equipment, training and operations will influence the growth of the commercial telemedicine market. Although the technology is migrating to the desktop and equipment costs are dropping, start-up costs for some telemedicine systems range from $50,000 to $100,000 for an individual site equipment to $8 million for a statewide system.

Telemedicine involves extensive use of telecommunications infrastructure. Until recently, transmission of a high-resolution, full-motion video signal was possible only through the use of expensive facilities, such as satellite uplinks (costing up to $3000 an hour) or microwave towers. Recent developments in digitization and data compression techniques and the availability of high bandwidth lines allow for transmission of the enormous amount of information needed to support many telemedicine applications.

It is expected that the implementation of the universal services principles of the Telecommunications Act of 1996 will further reduce the telecommunications costs for high bandwidth services for rural health care providers in Virginia through yet to be established discount structures.

Studies of costs and cost effectiveness studies are difficult to perform properly in the case of telemedicine since it may be difficult to determine whether a telemedicine contact is a substitute for another service or if it provides additional medical care. Thus it may be unclear whether the alternative to which telemedicine is compared is conventional care, or no care, or some other possibility.

Finally, it is important to study several levels of analysis for the study of costs. Telemedicine, for example, might be cost-effective for patients, yet produce greater expenditures for state health programs, Medicare and third party payers. In such a situation, the relative benefits of telemedicine are a legitimate concern.

Conclusions. When cost-effectiveness of new telemedicine systems and strategies is determined, value to the individual and the community is a critical consideration, and cost is only one element of the equation. The value of telemedicine systems to individuals and communities can exceed the simple calculations of dollars saved and additional care provided. Coordination of telemedicine services with other community needs and resources dramatically increases the value of such a system.

Recommendation(s). The medical community, providers of technology, and communications companies should be encouraged to fund and share the responsibility for establishing needed telemedicine sites and for identifying the most appropriate and cost-effective telemedicine applications.

Infrastructure Planning and Development

In the past, telecommunications capacity and technology resources requirements needed to support telemedicine applications were seldom factored into state level telecommunications planning and procurement decisions. Telemedicine applications, like interactive distance education and two-way video conferencing require high bandwidth capabilities that utilize interactive voice, video and data. Today, telecommunication in Virginia is developing rapidly. State officials recognize the benefits of telecommunication to enhance and improve services for the State's citizens. Although no statewide network currently exists to serve all of Virginia, both the Commonwealth Telecommuncations

Network (CTN) and a contract recently negotiated by Virginia Tech creating *Network Virginia (formerly Access Virginia)* appear to open new doors for implementing telemedicine in the Commonwealth.

Telecommunications costs and the need to update the telecommunications infrastructure in some rural areas (some communities are still dependent on rotary-style telephones) are inhibiting the delivery of telemedicine services. However, the creation of *Network Virginia* appears to hold promise for lowering the cost of adequate telecommunications capabilities across the State.

More significantly perhaps, the implementation of the universal services principles of the Telecommunications Act of 1996 will have significant impact on the availability of, and access to, advanced telecommunication services in rural Virginia, the telecommunications cost to rural health care providers and the deployment of infrastructure and services by telecommunications providers doing business in the Commonwealth.

As a part of infrastructure planning and development, minimal standards for the practice of telemedicine need to be established. This is probably best left to professional organizations as demonstrated by the standard for teleradiology adopted by the American College of Radiology. In many cases, however, sufficient data do not yet exist to support specific standards of practice.

Conclusions. Telemedicine applications must be customized for each community and include as many uses of technologies as possible. Invariably, under-served communities have limited economic resources. Thus, new technologies introduced must be utilized as fully as possible.

Technologic standards in the delivery of telemedicine must be established. Professional groups within the medical community should develop minimal technologic standards for provisions of telemedicine.

Recommendation(s). Initiatives should be encouraged and supported to ensure the continued growth of cost-effective statewide telecommunications networks capable of delivering maximum health care services to the rural communities.

Telecommunications service providers in the Commonwealth should be encouraged to participate in providing "last mile service" to Virginia's rural communities.

Benefits Discovery

To date, the promise of telemedicine remains largely intuitive, and the volume of telemedicine services throughout the country is rather small. While nationally there are numerous telemedicine demonstrations, there does not appear to be consensus that the quality of service is consistent with the traditional delivery of services.

Telemedicine appears to be generally effective, yet because so much of telemedicine has not yet been empirically evaluated, it is important that the quality of services provided by telemedicine programs be carefully assessed. Many of the concerns expressed by physicians who have used telemedicine have to do with diagnostic accuracy. Practitioners and insurers require some reassurance that the quality of telemedicine service is no less than the quality of service when delivered in the traditional manner. For nearly every specialty, it is possible to find some area about which physicians will report uncertainty.

Questions remain unanswered with regard to the costs of providing medical care by telemedicine since whether or not it is cost effective has not been established. Administrators of telemedicine programs point to such things as the savings in time due to decreased consultant or patient travel when they argue that telemedicine will save money. Yet, savings for patients and providers could be offset by increased expenses elsewhere in the system. Payers have a legitimate interest in

understanding the economic impact of reimbursement for telemedicine on their operations, and there is a strong likelihood that Medicare and other third party payers will see their costs increase.

Conclusions. If telemedicine is to assume an important role in provision of medical care, the primary goal should be to evaluate and develop the technology from the perspective of the under-served people in the United States. Although telemedicine has many potential uses in sophisticated information transfer between major medical centers and remote regions such as space, the most important contributions will be in the improvement of services to under-served populations in rural and urban areas.

Additional research on the quality of care achieved with telemedicine is needed. Preliminary studies have indicated that the quality of care provided by telemedicine can be nearly or fully equal to that of conventional health care delivery systems. Additional research is needed, however, for thorough evaluation of quality.

Recommendation(s). The Department of Health should be requested to coordinate, in conjunction with other agencies, a study and needs assessment to determine the deficiencies existing in health care services in rural Virginia which could be met by telemedicine.

V. SUMMARY

The provision of health care to patients, who for reasons of distance or circumstance do not have ready access to it, presents both a challenge to the medical community and an opportunity for the use of telemedicine. Telemedicine appears to be generally effective, yet because so much of telemedicine has not yet been empirically evaluated, it is important that the quality of services provided by telemedicine programs be carefully assessed. Depending on the specific application, data should be collected on medical effectiveness, practice patterns, effects on rural provider networks and hospitals, costs and related issues.

While telemedicine has the capability to address some of the most critical problems in the health care system (cost, quality and access), its ultimate success may well depend on removal of the serious barriers facing its optimal implementation. At present, the barriers, do not reflect inherent limitations in technology that compromise the clinical process but rather societal practices and restrictions. Some of these restrictions, such as state-based licensing, reimbursement, regulations and the like may not be resolved until a solid empirical case is made in support of telemedicine systems.

The claim that telemedicine will introduce revolutionary changes in health care delivery may be premature, yet the information age has already impacted health care as it has other human services. It would appear that the real question about the future of telemedicine is not whether it is a viable application of technology but rather the extent to which we have the foresight to exploit fully the capability of the technology to serve prevailing health care needs.

APPENDIX A. OVERVIEW OF STATE TELEMEDICINE INITIATIVES*

State	*Year Began*	*State Actions*
Arkansas	1995	Legislation calling for development of a statewide telemedicine and distance learning network, legislative committee and governor's advisory body to oversee network, strategic plan (1996), and special fund and other appropriations for network development (maximum of just over $6 million for 1995-97).
California	1994	Legislation designating state agency responsible for telemedicine, and possible future study. No implementation time frame.
Colorado	1993	Limited state action: 1993 legislation establishing telecommunications advisory commission (sunset 7/95), flexible discounted tariffing for telemedicine (1995) (not mandated, limited). 1995 ruling by Public Utilities Commission (PUC) mandating fund for grants program for telemedicine and distance learning ($4 million, judgment against U.S. West).
Georgia	1991	Pilot established at Medical College of Georgia. 1991 Public Services Commission ruling regarding telecommunications overcharges ($73 million fund) followed by 1992 legislation to establish statewide telemedicine ($8 million) and distance learning ($42 million) network, including coordinating board. Full implementation with 59 sites in 1995, under direction of Medical College of Georgia. Involvement of Department of Administrative Services (network design, operation of state network, negotiated transmission rates); Department of Corrections for prison component; Department of Human Resources (more than $300,000/year for 1991-95). Extensive state role in system development. State Medicaid reimbursement (provider & facility fee). 1995 additional special fund support.
Iowa	1994	Legislation provided health care access to state-owned fiber optic network created for education in 1989; established advisory bodies for state planning and study; report on telemedicine completed 11/94. Program development in 1994-95 all federally funded. 1995 legislative resolution to U. S. Congress calling for Medicare reimbursement for telemedicine.
Kansas	1990	Pilot established by University of Kansas Medical Center (KUMC). Supportive state role. Legislation validating KUMC telemedicine program (1993). KUMC continued expansion (12 clinical and 35 administrative sites in 1995) and reorganized; largely self-sustaining with only limited state funding (yearly line item appropriation, $150,000 in 1995). State government telecommunications network made available for KUMC telemedicine program (reduced rates). 1994 regulatory action (Kansas Board of Healing Arts) clarifying licensure policy regarding out-of-state providers, restricting consultations. Ongoing involvement (community planning) by Department of Health & Environment and state office of rural health.
Louisiana	1992	Governor's initiative leading to state planning role and state designation of federal rural development funds for telemedicine ($500,000 in 1994). Planning, support and direction from Office of Rural Development, Louisiana State University medical centers, Health Care Authority (including $50,000 for physician reimbursement), Department of Health & Hospitals, regional AHECs, and state corrections department (funding for prison telemedicine). Multiple, separate projects being developed. In 1995, program reorganization; also change in state policy. Legislature created state coordinating council to provide statewide focus, planning and coordination, and mandated private health insurance reimbursement for physicians for telemedicine.
New Mexico	1994	Legislation funding distance learning project ($200,000); separate authorization for study (earmarking of $289,000 appropriation to University of New Mexico Health Sciences Center for telemedicine development at 1 or 2 sites).
North Carolina	1994	Governor created public/private health information alliance. State government (Office of State Planning, Department of Commerce) leadership, planning, oversight role regarding information highway and telecommunications infrastructure including for health (not specifically for telemedicine); also overall administrative support and in-kind services, use of state purchasing process. Use of state network for distance learning and telemedicine. Department of Corrections limited prison telemedicine program. 1995 federal telemedicine project with small state funding ($50,000). Involvement of state medical schools.

State	*Year Began*	*State Actions*
Oklahoma	1993	Governor's initiative in telecommunications led to state planning and development of telemedicine network funded with Community Development Block Grant ($4 million); oil overcharge monies ($300,000) used for other projects. Governor's Office and Department of Commerce direction and support. Two state university health institutions involved. Planning for 2 years; 1995 network including 38 rural hospitals and 7 regional health facilities operational in fall 1995.
Oregon	1991	Targeted state funding: 1991-1995, multiple 2-year appropriations (biennium funding of between $400,000 and $1.2 million) to Biomedical Information Communications Center (BICC) of Oregon Health Sciences University for medical information services, education and telemedicine network (use of ED-NET, state educational network) linking 43 hospitals. Legislation in 1995 called for stronger role for state: state telecommunications council and executive department position ($133,500 for policy development). Medicaid reimbursement only for mental health network.
Pennsylvania	1993	PA HealthNet pilot project announced by governor, became operational in 1994 and 1995. Multi-faceted state initiative (part of primary care initiative) (funding of $400,000 for pilot). Use of state network. Involvement of Department of Health and Office of Administration. Present administrative support beyond pilot uncertain.
South Dakota	1993	Strong state role in coordination, planning, study, oversight, Governor's initiative. Report in 1995. Direct state funding (1994) (Community Development Block grant, $500,000) and use of state network for demonstration only. Federal grant for expanded program with private hospitals (1995 operational), with state coordinating. Substantial in-kind services by Department of Health, Public Utilities Commission actively involved. Facilitating regulations (1995); legislation enacted to reduce telecommunications costs in rural areas. Also legislation regarding non-resident telemedicine consultations and supervision of mid-level practitioners by telecommunications. Medicaid agency approved reimbursement (none billed as of 1995).
Texas	1989	Texas Tech University Health Sciences Center (TTUHSC) began MedNet with federal and state ($1 million) dollars. Center for Rural Health Initiatives funding ($175,000) for expansion of TTUHSC HealthNet & Rural Health Satellite Network, and support for academic health center consortium to develop programming for distance learning (1994). South Texas AHEC, with state funding (1993 line item appropriation to university, $700,000 for 2 years) primarily for distance education programs. Major Department of Criminal Justice telemedicine program begun (1994), to be statewide ($1 million to TTUHSC & University of Texas Medical Branch-Galveston for network and capital costs in 1995). Utilization of prison component already highest in country. Department of Information Services/General Services Administration development of special state transport network (reduced rates) for health science centers and selected rural sites (1995). Public Utilities Regulatory Act (1995) will make major funding (from telecommunications companies, up to $75-150 million for telemedicine, education and other uses/year for 10 years) available for statewide telemedicine and education network (infrastructure and program development), provide for state planning and oversight, and establish discounted telecommunications rates. Provider licensure law for non-resident physicians related to telemedicine consultations.
Utah	1995	Funding for program development (demonstration) to University of Utah Health Sciences. Center from mineral lease funds ($222,800). Other supportive legislation (education network, technology initiative). Involvement of Departments of Health, and Commerce and Economic Development. Newly created AHEC also involved.
Virginia	1996	Legislative resolutions (HJR 53 and HJR 109) calling for study on use and evaluation of telemedicine by 1997.
West Virginia	1995	Medicaid reimbursement established for telemedicine (federal project).
Wyoming	1994	Legislation gave Office of Rural Health responsibility for telemedicine development. No funding or implementation.

*Source: Intergovernmental Health Policy Project, The George Washington University, State Initiatives to Promote Telemedicine 1995.

APPENDIX B

GENERAL ASSEMBLY OF VIRGINIA - 1996 SESSION

HOUSE JOINT RESOLUTION NO. 53

Requesting the Council on Information Management, as part of the Information Technology Infrastructure Initiative, to evaluate roadblocks to the implementation of telemedicine applications in rural Virginia and recommend legislative or regulatory action.

Agreed to by the House of Delegates, February 1, 1996
Agreed to by the Senate, February 29, 1996

WHEREAS, according to the American Telemedicine Association, U.S. citizens logged more than one trillion miles of travel for medical purposes in 1993; and

WHEREAS, telemedicine can improve health, especially in rural areas, by increasing access to health care providers, decreasing the geographic and professional isolation of rural physicians, and improving continuity of care through the use of computers, television, phone lines, cameras, and fax machines; and

WHEREAS, according to the 1996 report of the Joint Commission on Health Care, telemedicine applications may be used to deliver both clinical services and educational programs to distant sites; and

WHEREAS, the Joint Commission on Health Care identified several unresolved issues surrounding telemedicine related to technology and technological infrastructure; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the Council on Information Management, as part of the Information Technology Infrastructure Initiative, be requested to evaluate roadblocks to implementation of telemedicine applications in rural Virginia and recommend legislative or regulatory action. The Council is requested to determine such legislative or regulatory action it determines to be necessary to enhance telemedicine capabilities within the Commonwealth.

The Council on Information Management shall complete its work in time to submit its findings and recommendations to the Governor and the 1997 Session of the General Assembly as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents.