Singing around the campfire, conducting shouting contests on the playground to hear who can break the sound barrier, bickering with siblings . . . these are the sounds of childhood that are indelibly etched into the memories of many adults. Now, imagine these scenes with a distorted or inaudible soundtrack and you will find yourself in Pripyat, Ukraine. Until April 26, 1986, most of us knew very little about Ukraine or the towns of Pripyat or Chernobyl, located approximately sixty miles north of Kiev. But, on that date, Chernobyl became infamous as the site of the world’s worst nuclear plant disaster.1 Eleven years later, thousands of children who had very high exposure to the fallout are being screened at a non-profit French clinic in Kiev called “Les Enfants de Tchernobyl.” Dr. Jordan C. Stern and his colleagues from the New York Eye and Ear Infirmary’s Department of Otolaryngology1 visited Kiev to examine children who now suffer from neck and vocal cord problems.2 The introduction of telemedicine into their practice will allow doctors at NYEEI to deliver medical services to the children in Kiev without having to leave New York.4

Since their visit, two professors from the Research Institute of Otolaryngology of Kiev have traveled to New York to meet with Dr. Stern and his colleagues at NYEEI. It is with them that Dr. Stern and NYEEI plan to set up a telemedicine link. Children could be sent from the French clinic to the Research Institute of Otolaryngology and examined by the local specialists. Then, the information could be sent to NYEEI either by live telemedicine conference or more likely, by an inexpensive delivery system known as store-and-forward electronic mail.5 “Extension of medical expertise to international locales is a natural course

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1 On April 26, 1986, Chernobyl’s Reactor Number 4 overheated causing the nuclear core to erupt into a fireball, blowing the top off the building, and spewing a radioactive cloud into the atmosphere. James A. Rupert, Nuclear Blight Invades Minds as Well as Bodies; Despair Taking Severe Toll on Chernobyl Survivor Series. Nuclear Nightmare: Chernobyl – 10 Years Later, Wash. Post. Apr. 18, 1996, at A18. The explosion was so great that it spread more than 200 times the radiation spread by the combined atomic bomb blasts at Hiroshima and Nagasaki. Id. The reactor burned for two weeks. Id.

2 Thirty-one people were killed immediately, mostly those who battled the blaze in its first few hours, and many medical specialists predicted that residents in the Chernobyl region would suffer from radiation-induced cancer. Id. One of the few clear effects of Chernobyl’s radiation is that it has produced a wave of thyroid cancer, especially in children. Id. The cause: radioactive iodine from the burning reactor absorbed into people’s thyroid glands. Id.

3 New York Eye and Ear Infirmary (“NYEEI”) is the oldest specialty hospital in the Western Hemisphere. NYEEI is the largest provider of quality primary eye care in the United States, and operates one of the nation’s most extensive ear-nose-throat clinics. Teleophthalmology at the New York Eye and Ear Infirmary (visited Feb. 24, 1997) <http://www.nyee.edu/teleinf/teleotod.htm>.

4 Recently, NYEEI has embarked on establishing a multi-faceted telemedicine program. The three components of the program are “(1) remote consultation and diagnostic services, (2) remote educational services, and (3) patient outreach.” Teleophthalmology at the New York Eye and Ear Infirmary, supra note 3.

5 Domestically, NYEEI is a member of a tele-ophthalmology consortium being organized with the Military Advanced Technology Management Office (“MATMO”) of the United States Department of Defense. In addition, NYEEI and NYNEX are partnering in joint promotion of telemedicine activities. Internationally, NYEEI has partnerships with Show Chwan Hospital, Changhua, Taiwan; Defense Medical Research Institute, Singapore; Ibn Al Haytham Hospital, Amman, Jordan; and the Institute of Otolaryngology, Kiev, Ukraine. Telemedicine at the New York Eye and Ear Infirmary (visited April 27, 1997) <http://www.nyee.edu/teleinf/telemed.htm>.

6 E-mail from Conor J. Heneghan, PhD, Director of Tele-Informatics, The New York Eye and Ear Infirmary and Assistant Professor, Department of Ophthalmology (February 18, 1997) (on file with CommLaw CONSPectus). See infra p. 14, for a discussion of “store-and-forward” e-mail.
for The New York Eye and Ear Infirmary, with enormous potential for the enhancement and equity of medical care across the region, nation and the world. In Part I, this Comment provides a brief back- ground of telemedicine and its potential for changing the delivery of medical services not only in the United States, but also around the world. In Part II, recent legislative and agency developments are examined, many of which will have an impact on the full implementation of telemedicine. Part III of this Comment describes the benefits which telemedicine promises to deliver. Theoretically, telemedicine technologies should make issues of distance inconsequential, however, many barriers exist which are thwarting its full implementation. In Part IV, these obstacles and possible solutions are discussed. Part V explores how these problems are affecting telemedicine in an international setting. This Comment concludes that the existing barriers to telemedicine must be overcome so that national and international communities can receive access to the world's best healthcare services. People deserve no less.

I. TELEMEDICINE: A PRIMER

A. Background

Telemedicine has the potential to dramatically change the lives of people in both the United

6 NYEEI and Show Chwan Memorial Hospital in Changhua, Taiwan are working together to facilitate the exchange of medical information, using both store-and-forward and video conferencing techniques. On June 6 and 7, 1996, NYEEI and Show Chwan Memorial Hospital conducted tests to establish a video-conference link between the two facilities. On August 16, 1996, a two-hour video conference was held between two teams of doctors at NYEEI and Show Chwan in which doctors discussed surgical procedures. Telemedicine Between The New York Eye and Ear Infirmary and the Show Chwan Memorial Hospital, Changhua, Taiwan (visited Feb. 24, 1997) <http://www.nyee.edu/current/taiwan.htm>

7 Current Events/What's New, referring to telemedicine activities at NYEEI. (visited Feb. 24, 1997) <http://www.nyee.edu/current/whatsnew.htm>


9 Jay H. Sanders, M.D. and Rashid L. Bashshur, Ph.D., Challenges to the Implementation of Telemedicine, in TELEMEDICINE REPORT TO CONGRESS, supra note 8, Appendix C, at 3.

States and abroad by addressing flaws in the health care system, particularly the uneven geographic distribution of health care resources; the inconsistent quality of care available to members of different economic classes; and the ever-increasing costs of healthcare. In 1996, an Advisory Committee on Telecommunications and Healthcare (“FCC Advisory Committee”) was established by the Federal Communications Commission to provide advice to the Commission on telemedicine, specifically relating to the rural telemedicine provisions of the Telecommunications Act of 1996. On October 15, 1996, the FCC Advisory Committee reported:

The convergence of healthcare technology and telecommunications technology offers an extraordinary opportunity to expand the availability and affordability of modern healthcare. Whether it is long-distance, video conferencing with specialists, the transmission of images or data, the availability of patient information, or medical education materials on the Internet, telemedicine expands access to healthcare.

B. Telemedicine Defined

Telemedicine is “the provision of health care consultation and education using telecommunications networks to communicate information.” Another useful definition of telemedicine is “the real-time or near real-time transfer of medical information between places.” For over thirty years, telemedicine has been practiced in one form or another. For example,
a physician providing advice over the telephone is considered a type of telemedicine. However, today's telemedicine applications involve advanced image as well as audio capabilities. They can range from high resolution still images (e.g., x-rays) to complicated interactive teleconferencing systems.

As the applications of telemedicine become more varied, the number of telemedicine experiments is soaring. Physicians in many states are evaluating state prisoners through video-conferencing to minimize security risks and high costs associated with transporting inmates. In December 1996, a live surgery was performed in the Netherlands and observed by researchers in other countries through interactive computer systems. Similarly, studies involving the use of telemedicine in nursing homes and home health care are currently underway.

C. How Telemedicine Works – A Technical Overview

The major telemedicine methods being used today are supported by electronic, computer-based transmissions, which involve modem linkage between sites by telephone lines of different capacities and high-speed switching systems using fiber optic telephone lines.

Store-and-forward multimedia e-mail, M-Bone video broadcasts and two-way tele-consultations are the primary techniques telemedicine clinicians and technologists are using to enable health care via the worldwide network of computer networks.

A health care specialist may use store-and-forward equipment which transmits recorded images for examination at a later time. This type of consultation might require only standard telephone lines at normal transmission rates. For example, "transmitting chest x-rays using digitized uncompressed images (two new films, plus two old films for comparison) requires approximately seven hours over a 14.4 kbps modem, 3.5 hours over a 28.8 kbps modem and only forty minutes over a more costly ISDN line." Video phones provide a more interactive store-and-forward system because they allow simultaneous transmission of audio high-resolution still images; thus, two doctors can examine a patient simultaneously. This type of consultation might require only standard phone lines because the transmission rate is 112 kbps. The consultation's "interactive" characteristics are derived from the concurrent transmission of audio and visual components. By using an ISDN bandwidth of 128 kbps or higher, the store-and-forward transmission becomes even faster, improves the quality of the image, and allows for limited quality video conferencing.

Higher volume and larger providers of health care services may prefer what is known as T1 capability, at 1.5 megabits-per-second (mbps). T1 provides adequate motion quality and the ability to send or receive real-time full motion video and voice among various sites, as well as provide data transfer capability at a considerably faster rate than the above illustrated transmission meth-
ods.\textsuperscript{32} For example, the chest x-ray example above which would require forty minutes over an ISDN line, would require only four minutes over a T1 line.\textsuperscript{33}

Another transmission method is called Asynchronous Transfer Mode ("ATM"), which uses a rapid 155 mbps transmission rate and offers very high resolution videoconferencing capabilities.\textsuperscript{34} ATM is a good option for applications that need very accurate and detailed imaging.\textsuperscript{35}

Three Washington, D.C. medical institutions – Georgetown University, George Washington University and Howard University College of Medicine – are currently using telemedicine programs.\textsuperscript{36} The telemedicine workstations are equipped with computers with one-or two-way, real-time and audio and video capability which are linked via satellite to transfer records, and allow the hospitals to generate images and conduct video conferences between sites.\textsuperscript{37} The telemedicine technology enables doctors to perform “telediagnosis, pediatrics, cardiology, infectious disease diagnosis, pathology, medical consultation and continuing education” from hundreds of miles away.\textsuperscript{38}

D. The Internet as a Telemedicine Delivery System

As national and international interest in telemedicine grows, telemedicine systems are being implemented in various configurations.\textsuperscript{39} Different telemedicine technologies need different transmission capacities or “bandwidth,” for example, low-tech store-and-forward equipment requires inexpensive telephone line bandwidth while real-time full-motion television requires expensive broadband infrastructure.\textsuperscript{40}

Many telemedicine professionals are looking to the Internet\textsuperscript{41} as a networking solution because of high prices and the closed, limited accessibility of leased line telemedicine networks.\textsuperscript{42} Admittedly, the Internet does not provide the quality of full-motion video that a dedicated T1 or T3 telecommunications line provides.\textsuperscript{43} Despite the promise of the Internet as a telemedicine delivery system, security and network reliability are the two critical issues that must be resolved before telemedicine practice via the Internet becomes commonplace.\textsuperscript{44}

II. ENCOURAGING THE DEVELOPMENT OF TELEMEDICINE

To prepare every American for the 21st century, we must harness the powerful forces of science and technology to benefit all Americans. This is the first State of the Union carried live in video over the Internet. But we've only begun to spread the benefits of a technology revolution that should become the modern birthright of every citizen. Our effort to connect every classroom is just the beginning. Now we should connect every hospital to the Internet so that doctors can instantly share data about their patients with the best specialists in the field.\textsuperscript{45}

— President William J. Clinton
A. Government Involvement

Several U.S. government agencies are currently involved in telemedicine studies and their findings (discussed below) are moving the telemedicine ball forward. Indeed, Washington is feeling increasing pressure for faster action on implementing telemedicine as the benefits in rural areas become widely recognized.46

1. Interagency Cooperation: The Joint Working Group on Telemedicine

One of the greatest advocates of telemedicine is Vice President Gore. In his campaign to promote the development of the National Information Infrastructure ("NII"), he identified telemedicine as "a key area requiring attention to ensure progress in the development of the NII."47 In 1995, Vice President Gore asked the Department of Health and Human Services ("HHS") to become more involved in developing cost-effective health uses for the NII.48 Subsequently, the Department of Commerce teamed up with HHS and the Joint Working Group on Telemedicine ("JWGT") was born.49

The JWGT is charged with assessing the Federal government's role in telemedicine and coordinating inter-agency telemedicine activities.50 One of its duties is to develop specific plans to overcome obstacles to the proliferation of telemedicine technologies.51 The findings of the JWGT will be essential to the government's assessment of telemedicine and its promise for the future.


The Telecommunications Act of 1996 articulates a national goal of "universal service," which is the "widespread availability of basic communications services at affordable prices."52 In the 1996 Act, health care was tied in to the universal service policy and, as a result, additional provisions were included that require the Federal Communications Commission ("FCC") to assure that rural health care providers have access to telecommunications services "necessary for the delivery of healthcare at rates that are comparable to those for similar services in urban areas."53

In accordance with the Telecommunications Act of 1996, the FCC convened a Joint Board, comprising federal and state communications commissioners, to make recommendations to the FCC for revising the overall universal service policy.54 The 1996 Act encourages federal and state communications commissioners to support the expansion of telemedicine.55 On October 15, 1996, the FCC Advisory Committee56 made its recommendations to the Joint Board for implementing the health care provisions of the 1996 Act.57

Telecommunications rates in rural areas are a significant encumbrance to telemedicine's growth because these rates are often significantly higher than those in urban centers.58 While telemedicine promises to improve the quality of healthcare for rural residents, the FCC Advisory Committee believes that the growth of telemedicine in rural areas will require both an

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46 Telemedicine: Big Sister is Watching You, ECONOMIST, Jan. 11, 1997, at 27.
47 Telemedicine Report to Congress, supra note 8, at ii. Since 1992, the Department of Commerce's Infrastructure Task Force ("ITF") has examined broad innovative uses of the NII. Id. Accordingly, in early 1994, it created the Health Information Application Working Group which included a subgroup focused on telemedicine issues. Id.
48 Id.
49 Id.
50 Id.
51 Id.
52 Id. at 74.
53 Telemedicine Report to Congress, supra note 8, at 74.
54 Id. at 75. Section 254(a)(1) of the Telecommunications Act of 1996 states that "Within one month after February 8, 1996, the Commission shall institute and refer to a Federal-State Joint Board under Section 410(e) of this title, a proceeding to recommend changes to any of its regulations in order to implement sections 214(e) of this title and this section, including the definition of services that are supported by the Federal universal service support mechanisms and a specific timetable for completion of such recommendations." 47 U.S.C.A. § 254(a)(1) (West Supp. 1996).
56 FCC Advisory Committee, supra note 11.
57 The FCC Advisory Committee's recommendation for the basic services to be covered by pricing comparable to that available in urban areas includes: (1) Internet access (available without long distance charges); (2) bandwidth up to 1.544 Mbps or equivalent; and (3) 4.8 kbps for ambulances because approximately eighty percent of the casualties in emergency situations are in rural areas, while only twenty percent are in urban areas. FCC Advisory Committee, supra note 11, at 4, 5.
58 Telemedicine Report Released, supra note 55, at 1.
adequate rural infrastructure buildout and a discounted rate.\textsuperscript{59}

On November 7, 1996, the Joint Board made its recommendations to the FCC with respect to universal service; however, it decided to postpone its recommendations for health care, citing the need for more explicit data regarding health care transmission costs.\textsuperscript{60} The Joint Board’s decisions were released for public comment and by May 8, 1997, the FCC is required to act on its recommendations.\textsuperscript{61} The JWGT will work together with the Joint Board and the FCC Advisory Committee to provide information about telemedicine infrastructure and costs.\textsuperscript{62}

B. Private Sector Involvement

The private sector is becoming increasingly involved in the development of telemedicine. This involvement should assist the Federal government in its efforts to achieve its objectives in the telemedicine arena.\textsuperscript{63} The JWGT has invited and encouraged private sector participation throughout its deliberations in order to gain the widest range of expertise and information possible.\textsuperscript{64}

The FCC Advisory Committee estimated that hundreds of billions of dollars for network facilities alone are needed to develop the NII.\textsuperscript{65} Without investment by the private sector, it will be nearly impossible to develop the NII to a point where all areas of the country are involved so that the advantages of the system are realized.\textsuperscript{66} The FCC Advisory Committee further acknowledged that the private sector is not likely to invest in areas where it will encounter competition with government-owned or subsidized networks.\textsuperscript{67} Therefore, in order to encourage private sector investments and competition, the FCC Advisory Committee recommended that the FCC establish “competitively neutral rules which ensure federal, state, or local government-owned or subsidized communication networks [that] do not unfairly compete by selling network services or excess capacity as commercial services in unfair competition with the private sector.”\textsuperscript{68}

III. THE BENEFITS OF TELEMEDICINE

A. Benefits from a National Perspective

1. Improved Access to Health Care and Improved Quality of Care in Underserved or Unserved Areas

As the JWGT stated in its Telemedicine Report to Congress: “[t]elemedicine has the potential to improve delivery of health care in America by bringing a wider range of services . . . to underserved communities and individuals in both urban and rural areas.”\textsuperscript{69} Through telemedicine, patients and doctors in rural or economically depressed areas may access specialized services, therefore increasing convenience, diagnostic capabilities, and the quality of local health care.\textsuperscript{70} According to Dr. Stern, the education received from direct interaction with generalists is one of the most obvious benefits of telemedicine.\textsuperscript{71} Dr. Stern and his colleagues at NYEEI plan to test their tele-otolaryngology program in clinics in underserved areas of New York City, in addition to emergency rooms lacking access to specialists.\textsuperscript{72}

2. Reduced Isolation Felt by Rural Practitioners and Patients

There is growing concern in this country about the reduced access to adequate medical services in rural areas. Many physicians are reluctant to practice in rural areas, where they may become isolated from urban centers, and in turn, isolated from important professional interaction and con-
ting medical education. Telemedicine has the potential to bridge the gap between urban areas, where there is a surplus of physicians, and less populated rural areas.73 Another benefit for rural communities is that telemedicine can help attract and retain health professionals by providing continuous training and collaboration with other health care providers.74

3. Reduced Costs to Patients and Providers

Telemedicine techniques enable physicians to diagnose and treat no matter where they are located.75 The elimination of geographic barriers reduces travel costs, cuts down on time requirements, and ultimately lowers health care costs.76 For example, a specialist can evaluate a patient remotely, instead of either doctor or patient traveling to a hospital.77 In instances requiring hospital admittance, stays could be reduced because telemedicine technologies could enable health care providers to evaluate patient progress remotely.78

In Virginia, a $2.5 million agreement signed by the State Department of Corrections and the University of Virginia Health Services Center will dramatically alter the way 20% of the state's inmates receive specialized health care.79 The telemedicine program will allow physicians to examine inmates by using interactive two-way television and audio equipment.80 Because inmates will remain at the prison for medical appointments, the state will no longer have to pay two corrections officers to escort each inmate to the hospital - a savings which will ultimately benefit the tax payer.81 Of course, the enhanced safety and security provide additional benefits for prison authorities and the outlying community.82

A telemedicine program in Ohio is realizing similar benefits. Currently, six prisons are networked to the Ohio State University Medical Center, with plans to expand the number to eleven by June, 1997.83 Although only a few hundred of the inmates use the telemedicine services, Correction Medical Director, Larry Mendel, remarked that there is "great potential for significant savings if telemedicine can reduce the number of inmates and guards on the road and upgrade the expertise of prison doctors and nurses."84 Furthermore, Mendel explained that, "eventually, prison teleconference centers could also be used to eliminate other kinds of travel, such as for routine court appearances or depositions."85 Such a development would broaden and exemplify the use of telemedicine.

The benefits of reduced costs to patients and greater quality of medical care is demonstrated in other programs as well. For example, at Children's Memorial Hospital ("CMH") in Chicago, Illinois, more than ninety transtelephonic transmissions of echocardiograms have been conducted with a diagnostic accuracy that exceeds that of all other reporting institutions.86 CMH also manages patients with heart disease, some of whom require transfer to the Hospital for cardiac surgery or interventional catheterization.87 In one case, a premature infant with heart disease was diagnosed at the remote site.88 The infant was successfully "team managed" at the nursery until the date of surgery twenty-seven days later.89 A total savings of $94,062 was achieved because the infant remained at the remote nursery, "where the parents also had the opportunity to bond with the baby."90 The surgery was successful and the child is now living a healthy life.91

B. Benefits from an International Perspective

As reported by the FCC's Advisory Committee, "Telemedicine offers the promise to enhance the

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74 TELEMEDICINE REPORT TO CONGRESS, supra note 8, at 1.
76 Id.
77 PHYSICIAN INSURERS ASSOCIATION OF AMERICA, supra note 12, at 3.
78 Bradham supra note 21, at 147.
80 Id.
81 Id.
82 Id.
83 Id.
84 Id.
85 Id.
86 Letter from Kaliope Berdusis and C. Elise Duffy in TELEMEDICINE REPORT TO CONGRESS, supra note 8, Appendix C, at 2.
87 Id.
88 Id.
89 Id.
90 Id.
91 Id.
well-being of people throughout the world." International use of telemedicine would enhance the ability of health care providers to track and prevent infectious disease as well as to administer public health programs such as immunization campaigns and training for health professionals and officials.

International telemedicine also provides a two-way benefit. U.S. medical providers like Dr. Stern can export their expertise to a broader community and teach foreign providers while learning from local medical customs.

On the economic side, referrals from the international community can create new revenue sources for U.S. medical institutions. In developed countries, U.S. telemedicine can support the delivery of on-line services, electronic publishers, or satellite transmissions. "[Telemedicine] technology allows the extension of expertise from the hospital to any forward point in the world." Other telemedicine programs besides those at

NYEEI include those in Bosnia, where the U.S. military is developing electronic networks that connect MASH units with physicians at locations in Europe and the United States. At New York Hospital-Cornell Medical Center, dermatologist Dr. Barney Kenet has signed a contract to deliver dermatology services electronically to colleagues in Austria.

IV. LEGAL AND TECHNICAL BARRIERS TO THE DOMESTIC USE OF TELEMEDICINE

A. Reimbursement

Reimbursement for services provided via telemedicine has not yet been resolved because most health insurance providers have taken a "wait and see" approach toward telemedicine payments. This approach is considered to be one

ment and prevention of AIDS. Procaare was created by Satellife and it is a medical collaborative effort among leading AIDS researchers from the Harvard AIDS Institute and Harvard School of Public Health, the European AIDS Commission, the Uganda Viral Research Institute and the All-India Institute of Medical Sciences. Procaare was created by Satellife and is carried over its HealthNet system. Internet users may access Procaare at <http://www.healthnet.org/ procaare.html>.

FCC Advisory Committee, supra note 11, at 15. The mounting African health crisis relates in part to inadequate information systems. Reaching Out: Lighting a Small Candle: Satellife, Science and Medicine, Sept./Oct. 1996, at 8. One U.S. organization, Satellife, is utilizing low-earth orbit (LEO) communications satellites to make communications resources available to health care workers in developing countries. Id. Messages composed on computers can be uploaded to the satellite, where they are stored until the satellite passes over the addressee's ground station. Id. Then the message is forwarded to the recipient. This is known as store-and-forward. Id.

FCC Advisory Committee, supra note 11, at 15.

Kloss, supra note 36, at D8. Chuck Dasey, public relations director officer for the U.S. Army Medical Research and Materials Command at Fort Detrick, Md., commenting on the multimedia telemedicine link at Georgetown University Hospital that connects troops in Operation Joint Endeavor, the peace-keeping mission in Bosnia, to the Combat Support Hospital in Taszar, Hungary and the Landstuhl Regional Medical Center in Landstuhl, Germany.

Walker, supra note 18, at 20.


Telemmedicine Report to Congress, supra note 8, at 51.
of the biggest obstacles to the full implementation of telemedicine. However, there appears to be some progress toward removing this barrier. This progress can be seen in a program recently implemented by the Health Care Financing Administration ("HCFA"). The HCFA began a three-year test of Medicare reimbursement for telemedicine consultations involving "hub" hospitals and remote "spokes." Four states (Georgia, Iowa, North Carolina and West Virginia) are participating in the program. It will take approximately five years before the HCFA's recommendations will be turned into law because government officials will need to evaluate the likely cost of telemedicine once it is sanctioned under Medicare. In the meantime, few private insurers or managed care organizations will cover teleconsultations. Until the results of current telemedicine projects are available and the organizations are given the opportunity to study its success and effectiveness, they are hesitant.

B. Physician Licensing

Although telemedicine promises to deliver many benefits, it raises many legal concerns with respect to the physician licensing system and standards for professional accountability, specifically relating to interstate practice. Accompanying the increase in the number of interstate telemedicine consultations is the risk that patients will receive care from providers whose credentials cannot be easily confirmed.

A key purpose of physician licensing is to establish academic and clinical competence standards for physicians so as to protect people from unfit or impaired practitioners. The current state-based licensure system may require some modification if the full potential of telemedicine is to be achieved. The JWGT reports that it is "very interested in stimulating the development of regional or multi-state licensure compacts that would provide models for future harmonization of licensure across the nation." This is the direction that states will need to take in order to allow for the practice of telemedicine to legally cross state borders.

1. Current Licensure Laws

Currently, each state's Medical Practice Act defines the process for granting and renewing a health professional's license and regulating medical practice within the state. Since most states require a physician to obtain a full license in order to practice within that state, a physician in one state may be legally restricted from providing services via telemedicine to a patient in another state unless he is legally licensed in both states. This risk of unauthorized practice limits telemedicine's potentially broad reach. Traditionally, physicians have used "consultation exceptions" for interstate physician-to-physician communications (e.g., mailing x-rays and laboratory specimens, and conducting oral or written inquiries to the out-of-state physician involved in the pa-

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103 Id.
104 Id. at 52.
105 The Health Care Financing Administration ("HCFA") is a government agency which administers the Medicare and Medicaid programs, in whole or in part. If a standard medical practice does not require face-to-face contact between patient and medical provider, then Medicare will cover the service (e.g., teleradiology). TELEMEDICINE REPORT TO CONGRESS, supra note 46, at 27.
106 Id. "The demonstration project is for fee-for-service payments to a limited number of facilities [located] in each state; it does not include all the facilities providing telemedicine within the participating states. TELEMEDICINE REPORT TO CONGRESS, supra note 8, at 52.
107 TELEMEDICINE REPORT TO CONGRESS, supra note 8, at 27.
108 TELEMEDICINE REPORT TO CONGRESS, supra note 8, at 27. This evaluation will be coordinated with HCFA and the Office of Rural Health Policy's evaluation of rural telemedicine programs. TELEMEDICINE REPORT TO CONGRESS, supra note 8, at 52.
tient’s care).\textsuperscript{121}

The growth of electronic communication has forced states to address issues concerning out-of-state physicians providing health care to patients within their borders.\textsuperscript{122} Although the intrastate practice of telemedicine is becoming more widespread, a number of states limit or prohibit the practice of telemedicine by a physician without that state’s medical license.\textsuperscript{123}

One state, California, through its Registration Bill\textsuperscript{124} grants the medical board of California discretion to develop a registration program which will allow out-of-state physicians to provide telemedicine services in that state.\textsuperscript{125} Although this statute shows increased interest in and willingness of legislatures to address the licensing issue, the California approach is not the current trend as interstate turf protection appears to be deep-rooted.

Under our country’s current state licensing system, significant administrative differences in the licensing process among states mean that multi-state telemedicine providers must face potentially costly and time-consuming filing and interview procedures before receiving a license.\textsuperscript{126} The limitations that state licensing laws place on national systems deny the public of nationwide access to highly specialized personnel and narrows the possibility of implementing a potentially cost-saving healthcare delivery system.\textsuperscript{127}

2. The Need for a National Licensing System

The creation of new licensing schemes is critical for the feasibility of national telemedicine systems.\textsuperscript{128} In order to be effective, a licensure system must include standards to ensure that health professionals are clinically proficient in their practice area.\textsuperscript{129} The system also must ensure that practitioners are mentally and physically competent, must be designed to identify incompetent practitioners and finally, must have the capability and procedures necessary to resolve patient complaints and address the misconduct of health professional misconduct.\textsuperscript{130} The system must also provide due process guarantees for licensees and applicants.\textsuperscript{131}

One rationale for implementing a national licensing system is based upon the fact that parts of the physician licensure examination are standard throughout the country.\textsuperscript{132} For example, all state medical boards require that physicians graduate from an accredited medical school, pass the U.S. Medical Licensure Examination and to be judged “fit” to practice medicine.\textsuperscript{133}

A national system would involve the issuance of a license based on a standardized set of criteria for medical practice throughout the United States.\textsuperscript{134} This system could be administered by a national professional organization.\textsuperscript{135} Alternatively, the national system could be implemented at the state or local level, which would simplify administrative procedures because states could retain control.\textsuperscript{136} Health professionals would still be required to obtain a license from every jurisdiction in which they practiced, but a common set of criteria would greatly facilitate the administrative process.\textsuperscript{137} In either case, these national standards would require states to agree on a common set of standards that encompass everything from qualifications to discipline.\textsuperscript{138} Currently, there are several reform proposals which would stand-

\textsuperscript{121} Telemedicine Report to Congress, supra note 8, at 28.

\textsuperscript{122} Id.

\textsuperscript{123} Id. at 42. States which have such limiting statutes include: Kansas, Nevada, Connecticut, Indiana, Oklahoma, South Dakota, Tennessee and Texas.

\textsuperscript{124} 1996 Cal. Legis. Serv. 864 (West).

\textsuperscript{125} Telemedicine Report to Congress, supra note 8, at 42, 43.

\textsuperscript{126} Huie, supra note 101, at 404.

\textsuperscript{127} Id.

\textsuperscript{128} Id.

\textsuperscript{129} Telemedicine Report to Congress, supra note 8, at 41.

\textsuperscript{130} Id.

\textsuperscript{131} Id.

\textsuperscript{132} Vyborny, supra note 13, at 78.

\textsuperscript{133} Telemedicine Report to Congress, supra note 8, at 42.

\textsuperscript{134} Id. at 40.

\textsuperscript{135} Id.

\textsuperscript{136} Id. “Models that formally grant licenses or recognize out-of-state health professionals will give states jurisdiction over out-of-state health professionals.” Id. at 42. Even though these models try to hold health professionals responsible for their conduct, the level of interest states will have in disciplining out-of-state practitioners who only seldom see patients in the state is unpredictable. Id. Economic concerns will continue to be present because systems that eliminate fees from the issuance and renewal of multiple licenses could leave states with fewer resources to fulfill their administrative and disciplinary functions. Id.

\textsuperscript{137} Id. at 41.

\textsuperscript{138} Id.
ardize certain licensure requirements.\textsuperscript{139}

Most of the people involved in the development of telemedicine agree that there is a need for standards, yet there is no consensus on how they should be developed.\textsuperscript{140} The combination of the constantly evolving field of telecommunications and the wide variety of specialties involved in developing clinical and educational guidelines, makes the development of standards a difficult task;\textsuperscript{141} however, inaction at the local or national level will inhibit the provision of teledmedicine technologies to those who need access to medical services.\textsuperscript{142}

3. Alternative Approaches to Licensure

Although the future of a single national licensure system remains bleak, other possible alternatives to a national licensure system exist.\textsuperscript{143} For instance, a limited licensure system could be implemented whereby health professionals could procure a limited license that allows them to deliver a specific scope of health services under particular circumstances.\textsuperscript{144} This system would limit the scope of practice rather than the time period necessary for practice, as is currently the case with some consultation or emergency exceptions.\textsuperscript{145} Alternatively, the consulting exceptions could be broadened.\textsuperscript{146} However, while telemedicine consultations could easily fall within many of these consultation exceptions, states have declined to interpret their consultation exceptions to include the practice of telemedicine.\textsuperscript{147}

Another possibility is the method of endorsement where state medical boards issue licenses to health professionals in other states that have similar standards.\textsuperscript{148} Other licensure alternatives include: (1) mutual recognition, a system in which the licensing authorities voluntarily enter into an agreement to legally accept the policies and processes (licensure) of a licensee’s home state;\textsuperscript{149} (2) reciprocity, a system in which two states allow a license which is valid in one state to be valid in the other state;\textsuperscript{150} (3) registration, which would allow a health professional licensed in one state to inform the authorities of other states that he or she wished to practice in that state on a part-time basis;\textsuperscript{151} and (4) Federal licensure, a system in the
Federal government would issue to health professionals a license which is based upon Federally established standards for qualifications and discipline.\textsuperscript{152} The Federal license would be valid in all states.\textsuperscript{153} Any changes in the licensure system should ensure against the development of a "lowest common denominator" standard of health care which would enable the least competent health professionals to simply relocate to the state with the lowest standards.\textsuperscript{154}

C. Malpractice Liability and the Physician-Patient Relationship

The existence of a physician-patient relationship creates a legal connection between the parties,\textsuperscript{155} however, definitions that specify what constitutes a physician-patient relationship have not yet been developed under telemedicine. As cited in the Telemedicine Report to Congress,\textsuperscript{156} the specific definitions developed will have to have legal as well as quality of care definitions. For example, the question of whether "distance medicine" compels a new legal standard of care must be resolved.\textsuperscript{157} Such definitions are necessary because recent case law suggests that before malpractice can be alleged, a physician-patient relationship must have existed.\textsuperscript{158}

In the past, the only way distantly located physicians could consult each other about a patient’s medical condition was by telephone.\textsuperscript{159} Thus, absent any case law, telemedicine could be analogized to telephone consultation cases, in which courts have determined the key issues to include:

1. Cases Where Physician-Patient Relationship Not Found

Case law has established that telephone conversations do not create a sufficient link between the consultant and the patient to form a physician-patient relationship if the consultant never personally examines or speaks with the patient.\textsuperscript{161} The courts in \textit{Lopez v. Aziz},\textsuperscript{162} and \textit{Roberts v. Hunter},\textsuperscript{163} held that since the patients were not examined by the consulting physician, no relationship was established. Absent a physician-patient relationship, the patients could not allege malpractice.\textsuperscript{164}

There are several issues in \textit{Clarke v. Hoek}\textsuperscript{165} that can be related to telemedicine by analogy.\textsuperscript{166} In \textit{Clarke}, a medical malpractice case against a physician who proctored a surgery, the Court of Appeals found that the proctoring physician owed no duty of care to the patient to prevent malpractice from occurring because he neither participated nor was asked to participate in the surgery.\textsuperscript{167} The physician was considered to be outside the "sterile field."\textsuperscript{168} In its opinion, the court stated that "the fear of potential malpractice liability would not only discourage participation by the medical profession in these volunteer [capacities] but would stifle and impair objectivity in

\textsuperscript{157} Id.
\textsuperscript{158} \textit{PHYSICIAN INSURERS ASSOCIATION OF AMERICA}, \textit{supra} note 12, at 11.
\textsuperscript{160} Id. (citing \textit{Hill v. Kokosky}, 463 N.W.2d 265 (Mich. App. 1990); \textit{Oliver v. Brock}, 342 So.2d 1 (Ala. 1976)).
\textsuperscript{162} 852 S.W.2d 303 (Texas App. 1993).
\textsuperscript{163} 426 S.E.2d 797 (S.C. 1993).
\textsuperscript{164} \textit{PHYSICIAN INSURERS ASSOCIATION OF AMERICA}, \textit{supra} note 12, at 11.
\textsuperscript{165} 174 Cal. App. 3d 208, 219 Cal. Rptr. 845 (1985).
\textsuperscript{166} Granade and Sanders, \textit{supra} note 159, at 69.
\textsuperscript{167} \textit{Clarke}, 174 Cal. App. 3d at 220.
\textsuperscript{168} Id.
Recent case law suggests that a physician-patient relationship will be found between telemedicine practitioners and the patients whom they see. Although most states have not considered many consultation cases, those that have done so have relied heavily on the holdings in other states when they are confronted with the same issues. For this reason, it appears that the trend establishes the Clarke factors as the means for determining the existence of a physician-patient relationship.

2. Cases Where Physician-Patient Relationship Found

In Davis v. Weiskopf, the Illinois appellate court remanded the case to trial after finding that a sufficient physician-patient relationship existed. In this case, the consulting physician examined the patient’s x-rays and knew that the radiologist’s report revealed the patient’s bone cancer. The physician dismissed the patient following several missed appointments, never having examined him. The patient and the physician offered differing testimony regarding who was at fault for the missed appointments. The patient sued the physician for malpractice after he discovered his condition. The court held that a physician-patient relationship was established when the patient made an appointment with the consulting physician, while acknowledging that this case involved “unusual circumstances.”

The holding in Davis could extend to telemedicine in cases where the patient and the physician meet face-to-face through telemedicine technology. In Davis, the consulting physician was the only physician with whom the patient was in contact. This situation would be different in the telemedicine context because the treatment would be left to the locally licensed physician after a telemedicine consultation.

In Dougherty v. Gifford, the court held that a physician-patient relationship existed between a lab and its pathologist and a patient whose biopsy it mistakenly labeled as malignant. The patient and the physician never met. However, the Texas Court of Appeals found the relationship was created when the lab accepted the pathology work, conducted the tests, prepared a report on its findings and billed the patient, stating there was no doubt the diagnostic services were furnished on the patient’s behalf.

3. Vicarious Liability

In any telemedicine meeting, it is crucial that the referring physician know the identity of the teleconsultant and his or her qualifications to practice medicine. It is also critical that the referring physician define the responsibility of the consultant involved in the encounter so that the roles of each person are clearly identified. Any confusion over responsibilities in making the diagnosis could render the referring physician vicariously liable.

D. Network Reliability

Security and network reliability must be resolved before the Internet becomes a dominant telemedicine delivery system. Technical standards for telecommunications or equipment infrastructure also have safety implications. For example, if the telecommunications infrastructure is not reliable and there are no redundancies built in, patients may be at risk if the system unexpectedly fails at a critical moment. Despite their higher cost, closed networks provide the

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169 Id.
170 Granade and Sanders, supra note 159, at 73.
171 Id.
172 Id.
173 430 N.E.2d 60 (Ill. App. 1982).
174 Id. at 65.
175 Id. at 61.
176 Id.
177 Id. at 64.
178 Id. at 61.
179 Id. at 65.
180 Granade and Sanders, supra note 159, at 69.
181 Id.
182 Id.
user with the advantage of control and reliability, two important features that the Internet cannot yet provide.\textsuperscript{193} On the Internet, users have no assurance of how quickly e-mail messages travel from place to place or if the Internet will even function properly.\textsuperscript{194} If a physician needed to perform an Internet tele-consultation on the evening of the presidential election, he or she may not have been able to connect with the other party.\textsuperscript{195} That evening, the volume of users simultaneously seeking information on the national election caused the Internet to be plagued with "brown outs," which are significant slow downs or failures that reduce its reliability.\textsuperscript{196}

E. Privacy Concerns

Acquisition of electronic medical records is another barrier to the widespread use of telemedicine.\textsuperscript{197} The possibility that hackers could tap into the network and gain access to confidential medical data is not impossible to imagine.\textsuperscript{198} Industries are addressing security problems by developing more complex data encryption programs in order to overcome perceptions that the Internet is not a secure alternative to other networks.\textsuperscript{199} However, any computerized medical record office should have appropriate guidelines, policies and procedures, including written agreements with participating physicians, and appropriate written disclosure to patients.\textsuperscript{200}

F. Getting People to Learn New Things

We live in an age of rapid technological change. The "new and improved" computer system you purchased yesterday is out-of-date tomorrow.\textsuperscript{201} These changes carry with them a natural resistance to learn a soon-to-be outmoded system.\textsuperscript{202} "Pen and paper still have their allure."\textsuperscript{203} But dramatic technological changes are still occurring, and the array of problems that are likely to arise compels action now to avoid confusion and needless litigation.\textsuperscript{204} Dr. Stern asserts that one of the biggest barriers and one of the most critical factors for success of telemedicine is getting people to overcome their fear of new technology.\textsuperscript{205} Making telemedicine technology user-friendly and time saving, rather than time-consuming, is critical for its success.\textsuperscript{206}

V. INTERNATIONAL USE OF TELEMEDICINE

A. Barriers Present in the International Setting

Many of the barriers to implementing telemedicine domestically also are present internationally.\textsuperscript{207} Many countries do not have sufficient access to telecommunications infrastructure, technology and Internet at reasonable and affordable rates; they have minimal or competing priorities for capital and public resources; and their existing telecommunications systems are incompatible with those of other countries.\textsuperscript{208} In addition, medical licensure requirements and liability issues often vary from country to country.\textsuperscript{209}

The FCC’s Advisory Committee identified additional barriers to the international provision of telemedicine services.\textsuperscript{210} Included among these barriers in foreign locations are:

- the availability of medical and technical personnel; the existence of appropriate payment mechanisms; the effect of multiple time zones; the lack of internationally accepted standards and protocols for all medical and telecommunications equipment and services; the existence of foreign government restrictions, licenses, permits, etc., for the construction of telemedicine facilities; the existence of import duties on medical and telecommunications equipment; concern about relinquishing control over local health and medical systems; and political and language barriers between countries and regions within countries.\textsuperscript{211}

\textsuperscript{193} Siwicki, supra note 22, at 75.
\textsuperscript{194} Id.
\textsuperscript{195} Id.
\textsuperscript{196} Id.
\textsuperscript{197} PHYSICIAN INSURERS ASSOCIATION OF AMERICA, supra note 12, at 9.
\textsuperscript{198} Siwicki, supra note 22, at 75.
\textsuperscript{199} Id.
\textsuperscript{200} James Rosenblum, Medical Liability in Cyberspace, 8 HEALTH LAWYER 10, 12 (Summer 1995).
\textsuperscript{201} Id.
\textsuperscript{202} Id.
\textsuperscript{203} Id.
\textsuperscript{204} Id.
\textsuperscript{205} E-mail from Jordan C. Stern, M.D., supra note 3.
\textsuperscript{206} Id.
\textsuperscript{207} FCC ADVISORY COMMITTEE, supra note 11, at 16.
\textsuperscript{208} Id.
\textsuperscript{209} Id.
\textsuperscript{210} Id.
\textsuperscript{211} Id.
B. Promoting Use of Telemedicine Internationally

Some of the barriers to accessing telecommunications services may be alleviated as a result of the World Trade Organization Agreement on February 15, 1997, in which sixty-nine countries agreed to drop barriers and encourage competition in ninety percent of the global market.\(^\text{212}\) "This agreement represents a change of profound importance. A sixty-year tradition of telecommunications monopolies and closed markets has been replaced by market opening, deregulation and competition – the principles championed here and embodied in the 1996 Telecommunications Act."\(^\text{213}\) Network development is expected to soar as smaller countries open markets and permit foreign entities to invest in existing monopolies.\(^\text{214}\) Telemedicine will surely benefit from increased infrastructure development in many countries.

In its report, the FCC’s Advisory Committee recommended that a working group should be created to support the promotion of international telemedicine.\(^\text{215}\) "The working group should have adequate resources so it can serve as an advocate for and facilitator of international telemedicine exchanges and act as a clearing-house for international telemedicine information."\(^\text{216}\) The Advisory Committee also recommended that the U.S. government play an active role in advocating the use of international telemedicine and that it assist organizations in removing barriers to its full implementation.\(^\text{217}\)

VI. CONCLUSION

As Dr. Stern states, “The human body is the same throughout the world, laws are different. I see no reason why a good licensed physician cannot consult on patients anywhere in the world. I see many reasons why bad physicians should practice nowhere (whether licensed or not).”\(^\text{218}\)

The current efforts being made by the Federal government to foster the growth of telemedicine are imperative to its proliferation on a national and international level. As rapid technological advances are made in telemedicine delivery systems, the Government must keep apace with its efforts to resolve the legal barriers facing telemedicine. Identifying the obstacles is a start, but the Government cannot rest on its laurels while communities remain without quality medical services – medical services which telemedicine promises to deliver.

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\(^{214}\) *Telecom Companies Hail WTO Agreement*, supra note 212, at 2.

\(^{215}\) *FCC Advisory Committee*, supra note 11, at 16. Members should include representatives from the FCC, HHS, USTR, DOC and DOD as well as private sector enterprises involved in telemedicine and members of the medical and academic/research community. *Id.*

\(^{216}\) *Id.* at 17.

\(^{217}\) *Id.* The Advisory Committee recommended that the U.S. government should promote implementation of international telemedicine by U.S. providers. *Id.* Among its recommendations, it suggested that the government provide initial funding assistance for private sector telemedicine providers when no other funds are available; encourage international organizations (World Healthcare Organization, International Telecommunications Union, UNESCO) to address issues of standardization and protocols; support organizations already providing global healthcare (e.g., Pan American Healthcare Organization and NASA); develop international trade policies that reward the implementation of telemedicine; and, lower the economic barriers to exchange of healthcare information services and information. *Id.*

\(^{218}\) E-mail from Jordan C. Stern, M.D., supra note 3.