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American Diagnostic Radiology Moves Offshore: Is this Field Riding the "Internet Wave" into a Regulatory Abyss?

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AMERICAN DIAGNOSTIC RADIOLOGY MOVES OFFSHORE: IS
THIS FIELD RIDING THE “INTERNET WAVE” INTO A
REGULATORY ABYSS?

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I. INTRODUCTION

Recent trends in the American workplace are suggesting that outsourcing is becoming more commonplace, and currently no job or its work product may be safe from outsourcing. American blue-collar workers are certainly not surprised by these trends because they have experienced outsourcing related job losses since the early 1970s.¹ Even those white-collar jobs traditionally considered immune to outsourcing pressures, such as those held by medical specialists, are now threatened.

Most workers know outsourcing as a process whereby a domestic firm transfers some portion of their work product or job to a different firm that resides either onshore in America or offshore in some foreign land. The transferring domestic firm contracts with one of these firms, intending to make that new firm its outside supplier.² Although most transferring firms see outsourcing as a positive business experience, some work transfers have both intended and unintended consequences. Some transfers may produce a net loss of jobs within the affected sector. Others may create a downward pressure on wage earnings of the affected worker, especially in labor-intensive areas, such as those in manufacturing. In still others, workers may even experience personal stresses, such as increased anxiety or fear that are related to their worries over impending or future job losses. These personal stressors may also place an additional burden on affected workers by compelling them to make fewer demands on their managers. Some workers may come to believe that issuing fewer demands will translate into a greater likelihood that they will keep their jobs. Unfortunately, their beliefs may be misguided.³

Over the past three years, outsourcing may have removed nearly a half million jobs from the American economy. Some experts say that if this trend holds true,

¹ Thomas R. McLean, *The Offshoring of American Medicine: Scope Economic Issues and Legal Liabilities*, 14 ANNALS HEALTH L. 205 (2005).

² Daniel W. Drezner, *The Outsourcing Bogeyman*, FOREIGN AFFAIRS, May-June 2004, available at <http://www.foreignaffairs.org/20040501faessay83301/daniel-w-drezner/theoutsourcing-bogeyman.html>.

³ Lael Brainard & Robert E. Litan, "Offshoring" Service Jobs: Bane or Boon and What to Do?, THE BROOKINGS INSTITUTION (Apr. 2004), available at <http://www.brookings.edu/comm/policybriefs/pb132.htm>. (explaining that the reduction in manufacturing jobs is related to competitive pressures, advances in technology, and desire for cost reductions).

then nearly 3.3 million jobs will be erased by 2015.⁴ Anyone who doubts the impact of outsourcing on the American workforce need only ask Lou Dobbs, the author of *Exporting America*, and the current host of the CNN programs *Moneynline* and *Lou Dobbs Tonight*, for his opinion. Dobbs leaves no doubts when he tells Americans that “America is going wrong” when it exports jobs to foreign markets, such as China and India.⁵ Others, however, say that Dobbs has got it all wrong because outsourcing has actually expanded the American economy through both job creation and elimination.⁶ Clearly, strong differences of opinion do exist over what the true utility of outsourcing means to the American economy.

Now, American white-collar workers are watching their once safe, well-paying domestic jobs go elsewhere. Some economists are understandably apprehensive over the movement of white-collar jobs offshore because they believe white-collar jobs are generally associated with high levels of pay. Some economists, however, are less concerned because they believe these jobs really do not come from the “high-value-added sector” of our economy.⁷ Still others see outsourcing as one of “creative destruction,” whereby the workers lose their jobs, which in turn leads to a loss of their health care benefits. Ultimately, workers may receive a double whammy, where they are initially hit by a job loss, which is then coupled with the costs of finding a new job. Even if these workers do find a new job, they often experience a comitant reduction in pay. As one analyst aptly points out, any wealth generation arising from outsourcing is usually divided among the foreign outsourcing market, consumers, and shareholders of the affected companies.⁸ Ultimately, the true beneficiaries of outsourcing are the unaffected consumers and shareholders of the firms doing the outsourcing, not the workers who have lost their jobs.⁹

The good news for American white-collar workers comes for those in the fields of research and development or personal care services. Jobs in these areas may be less susceptible to outsourcing pressures than those in manufacturing. This news, however, arrives with the caveat that the nature of the work product must be tied to a group of local consumers.¹⁰ This means that any movement of a task away from

⁴*Id.*

⁵Michael McCarthy, *Dobbs Fires Away Against Outsourcing*, USA TODAY, Feb. 22, 2005, available at http://www.usatoday.com/money/economy/employment/2005-02-22-dobbs-usat_x.htm.

⁶Drezner, *supra* note 2.

⁷*Id.*

⁸*Id.*

⁹Brainard & Litan, *supra* note 3 (quoting the McKinsey study which estimates that for “every dollar of U.S. service activity that is offshored, there is a global gain of \$1.47, suggesting a net gain of 47 cents. In their analysis, India captures 33 cents of the total, leaving the United States with the remaining \$1.14. . . . ‘Reemployed’ workers get 47 cents (a substantial reduction), additional exports account for a relatively modest 5 cents, and shareholders and consumers of the firms doing the offshoring gain the other 62 cents. U.S. shareholders and consumers win while U.S. workers lose”).

¹⁰Drezner, *supra* note 2 (stating that ninety percent of jobs in the United States require geographic proximity, which includes jobs in the retail, restaurant, marketing, and personal care industries, and these jobs should not move offshore).

such a community of willing consumers will necessarily translate into a net loss of market share. Unfortunately, there is plenty of bad news awaiting those workers in the white-collar sectors who produce a work product that relies on the process and repeatability of a given task. White-collar workers performing these types of jobs may see ongoing losses because these jobs do not require a high level of skill; thus, they may be outsourced to either onshore or offshore firms. Thus, jobs are susceptible to outsourcing based on the nature of the work itself, where repetitive tasks, which are easily learned and require low levels of skill, lend themselves to task standardization. Task standardization, in turn, allows low skill level workers, who may already occupy a particular sector of a different workforce, to easily master the task.¹¹

Currently, firms are outsourcing their work to both onshore and offshore firms because global communication costs are dropping, and computer software is becoming more standardized and readily available.¹² More importantly, the Internet has become a readily available transmission source that is accessible to outsourcing firms, who wish to reach out and touch someone anywhere in the world. Thus, task standardization couples with the global reach of the Internet to create an opportunity for participating firms to outsource their goods and services into the global market place. Now, firms may seek to exercise their comparative advantage over competing firms by utilizing the expanded reach of the Internet to outsource.¹³

Unfortunately, the really depressing news comes for American workers in customer service, telemarketing, document management, tax preparation, financial services, and medical transcription services, where jobs in those sectors, which are traditionally white-collar ones, are likely to be lost to outsourcing pressures over an ever-increasing scale.¹⁴ Based on current practices, one might conclude that almost any work product that can be digitized and downloaded into a computer for transmission through the Internet can be outsourced.¹⁵ Maybe the former head of Hewlett-Packard, Carley Fiorina, got it right when she told Congress, in her now infamous line, that “there is no job that is America’s God-given right anymore.”¹⁶ Perhaps Congress and Lou Dobbs did not appreciate her message, but the truth is firms will always seek to gain a comparative advantage over their competitors, and they will keep on outsourcing as long as it reduces their costs and boosts their profits.¹⁷ Yes, outsourcing activities will likely increase over the next decade, but

¹¹*Id.*

¹²*Id.*

¹³*Id.* (quoting an executive with the IBM corporation who said “[globalization] means shifting a lot of jobs, opening a lot of locations in places we had never dreamt of before, going where there’s low-cost labor, low-cost competition, shifting jobs offshore”).

¹⁴*Id.*

¹⁵*Id.* (quoting Nandan Nilekani, the chief executive of the India-based Infosys Technologies, as saying “[e]verything you can send down a wire is up for grabs”).

¹⁶*Lou Dobbs Tonight* (CNN television broadcast Feb. 9, 2005), available at <http://transcripts.cnn.com/TRANSCRIPTS/0502/09/ldt.01.html>.

¹⁷Steven M. Suranovic, *International Trade Theory and Policy*, <http://international.econ.com/Trade/Tch40/T40-0.php> (last visited May 3, 2007). (explaining that the theory of comparative advantage in economics says two countries will find it beneficial to trade with

they may not be the “tsunami that many claim.”¹⁸ Yes, even the highly technical and lucrative professional jobs associated with the field of medicine, once considered oriented and anchored to a local community, may be swept to distant shores.¹⁹

Perhaps the best way to understand the outsourcing dynamic taking place in highly specialized areas of medicine, such as diagnostic radiology, is to think of a person who suddenly sees a tsunami wave for the first time. Imagine, a radiologist standing on a beach front somewhere in the Pacific Northwest gazing westward toward Asia and thinking about the outsourcing of radiology images that is currently taking place in her discipline. Now, suppose this radiologist has no clue that the shoreline she is standing on faces the Cascadian Subduction Zone, which is also a tsunami zone.²⁰ Suddenly, without warning, an undersea earthquake occurs far offshore within this zone. The force of the quake elevates the seabed, which creates a tiny, almost imperceptible, ripple on the surface of the ocean. This sea change may be no different than the outsource events currently taking place in diagnostic radiology, where teleradiology and Internet services are enabling health care providers to shift radiology workloads to both onshore and offshore sites, with some offshore sites residing in distant countries, such as India and Australia. Because both events are almost imperceptible, she may not appreciate either event until she notices a sea change, as both her California tide and the teleradiology services suddenly start shifting both her water and work westward. She may show no concern at first, believing that she is safe, because all are gaining momentum. She may even believe that her positions, both on the beach and at her workplace are safe and secure, even though the pace at which events are changing is ever increasing. Suddenly, without warning, both waves appear and strike with such force that they sweep the radiologist and her work away. For the radiologist standing on that stretch of coastline, such events would seem impossible, but geological records reveal that the last tsunami to strike the Northern California coastline did so on January 26, 1700.²¹ Even the medical specialty of diagnostic radiology is experiencing an ever increasing shift of its work and professional jobs to foreign markets.²² Thus events, as unlikely as they may be, can and do happen.

In fact, some members of this profession recently learned that one of their colleagues, an American-trained Indian radiologist from Yale University, had started to read radiology work transmitted to Bangalore, India, which signaled the beginning

each other even though the countries can make the products they are trading within their borders, and the cost of production is not of primary concern, but it is the ratio between how easily the two countries can produce different items).

¹⁸Drezner, *supra* note 2.

¹⁹Andrew Pollack, *Who's Reading Your X-Ray?*, N.Y. TIMES, Nov. 16, 2003, at 31 (noting that American radiologists who make annual salaries estimated at \$250,000 or more per year now have concerns for movement of their jobs to foreign markets).

²⁰Tsunami, <http://www.fema.gov/hazard/tsunami/index.shtm> (last visited May 28, 2007) (citing that tsunami waves can smash into land with waves as high as one hundred feet or more, and the most likely United States strike zone is along the Pacific Northwest coastline).

²¹World Science, Possible Next Tsunami Victim: America's West Coast, http://www.world-science.net/newspg2/041229_tsunamifrm.htm (last visited May 28, 2007).

²²Pollack, *supra* note 19.

of a sea change for most radiologists. Once they became aware of his entrepreneurial enterprise, they began firing off angry e-mail messages to him.²³ Still others took a slightly different approach by simply plastering their e-mail messages, which expressed their feelings of hate and outrage, to the message board of a well-known and well-visited radiology web site.²⁴ It seems this sort of behavior does not comport with the behavior expected from respectable professionals, but it definitely illustrates just how much fear and anger can be generated within a group of professionals who feel their job security is threatened.

Not only do rank-and-file radiologists feel threatened, but state legislatures and members of Congress also expressed concern over the potential impact these services may have on the health and privacy of American patients. Two well-known democrats, Representative Edward Markey and Senator Hillary Clinton, recently voiced their concerns over the potential impact of these practices on American patients, as consumers. Both legislators have recently initiated legislation which forces radiology reading services utilizing offshore reading services to notify affected patients, as potentially unwilling consumers of these services, that their health care providers outsource their radiology work to other countries.²⁵ Clearly, events are signaling a sea change which is generating a giant wave of controversy rather than the mere ripple effect that some have suggested.

The goal of this article is to explain why teleradiology services are creating a sea change in the practice of diagnostic radiology. This sea change is morphing the work dynamic of the past, where the radiology work of a given community was associated with local radiologists, to one of the digitally-driven-world of teleradiology, where images may be beamed worldwide. In fact, the current shift of radiology reading to foreign markets may be gaining steam because teleradiology services makes foreign physicians accessible, and most importantly, they are ready, willing, and able to work for less. Part II of this article shows why advances in medical telecommunications make radiologists and their work vulnerable to outsourcing. Part III follows the rise of telecommunications in medicine from its early beginnings in telemedicine to its sub-specialization in the form of teleradiology and illustrates how a worldwide shortage of diagnostic radiologists led to the use of teleradiology services to outsourcing radiology work. Part IV explains why many of the state and federal laws potentially act to limit the outsourcing of radiology images in both domestic and foreign markets. Finally, Part V argues that outsourcing of medical images may not be the evil that some believe it to be. On the contrary,

²³*Id.* (noting that Dr. Sanjay Saini, a United States trained diagnostic radiologist, got multiple acrimonious, but anonymous e-mails urged him to stop his operation).

²⁴*Id.* (noting that online discussion group at AuntMinnie.com had multiple postings such as “[t]his teleradiology is another nail in the coffin of the job market,” while a different post went “[w]ho needs to pay us \$350,000/yr if they can get a cheap Indian radiologist for \$25,000/yr”).

²⁵Douglas Page, *Legislation Tackles Offshore Teleradiology* (May 18, 2005), http://www.diagnosticimaging.com/pacsweb/printer_friendly/?articleID=163105354 (noting that Representative Markey and Senator Clinton have introduced legislation entitled Safeguarding Americans from Exporting Identification Data Act (SAFE ID), which requires an individual to be notified when an offshore radiology service is used; the Act was last introduced in 2004, but failed to pass committee).

teleradiology services need fewer state and federal regulations because acceptance of this process is a natural progression within a profession that is driven by technology. By adopting the licensing scheme currently in existence within diagnostic radiology as a license to practice teleradiology across state lines, the profession, states, and patients may all enjoy greater access to radiology services and improved patient safety. Such a licensing scheme would require the recognition of a specialty license that covers the teleradiology transmission of medical images across the borders of both states and participating nations. Countries and their physicians, upon adoption of a universal but limited teleradiology license, might avoid many of the problems associated with the existing state licensure process. Adoption of such a licensing scheme could lead to globalization of diagnostic radiology through increased utilization of teleradiology services. It could become a “win-win” for all parties by reducing shortages and increasing access to services as well as improving the quality of care delivered. The question remains whether all parties will embrace the sea change and use it for their benefit or remain resistant and be swept away by the onrushing tsunami of technology.

II. THE SEA CHANGE BEGINS IN MEDICINE

A. *The Wave of Change Begins with Telecommunications*

Currently, the world is approaching the middle part of the first decade of the twenty-first century, and its citizens continue to witness fundamental changes in the way society and business interact worldwide. One of the driving forces behind this global wave of change are the rapid advances in computer and communication technologies. These advances are further driven by the worldwide communications network known as the “Internet.”²⁶ This global communications network provides its users with access to individuals and businesses throughout the planet. Its existence is owed to a complex, collaborative effort from scientists, governments, and businesses.²⁷

The prototype for the Internet, which is the major communication and information infrastructure for the world, and now modern medicine, likely had its early beginnings at the Massachusetts Institute of Technology (MIT) in the early 1960s as the National or Global Information Infrastructure.²⁸ The United States Department of Defense assembled a team of scientists with an interest in communications and network switching packet theories into a group known as the Defense Advanced Research Projects Agency (DARPA).²⁹ Their work eventually led to the validation of the scientific principles underlying networking theory, which

²⁶Barry M. Leiner et al., *A Brief History of the Internet*, <http://www.isoc.org/internet/history/brief.shtml> (last visited May 28, 2007) (reviewing the origin of the Internet and its impact on society).

²⁷Richard T. Griffiths, *The History of the Internet*, <http://www.let.leidenuniv.nl/history/ivh/chap2.htm> (last visited Apr. 16, 2007).

²⁸See Leiner et al., *supra* note 26 (discussing the formation of the DARPA from scientists from MIT and California who initially advanced the theoretical feasibility of computer communications using information switching packet applications to create a computer network).

²⁹*Id.*

led to the formation of the Advanced Research Projects Agency Network (ARPANET), which was the first linkup of computers in Massachusetts and California. The key feature of this primitive network is the packet switching technology known as the Interface Message Processors (IMP).³⁰ Not only did this IMP technology enable the DARPA group to make initial connections, but it also gave them a way to add more computers or nodes to the developing network.³¹ Scientists then took advantage of this increased connectivity to send electronic messages or e-mail to create the forerunner of the current e-mail system.³² Unfortunately, the degree of connectivity they achieved was limited by its end-to-end reliability, and further advances had to wait until a new open-architecture network known as the Transmission Control Protocol/Internet Protocol (TCP/IP) was established.³³ Thus, TCP/IP network formations now served as the general infrastructure for the modern Internet.³⁴

Once the end-to-end stability of these networks was assured, both academic institutions and governmental agencies began to expand their own networks.³⁵ In 1984, the British government adopted the Joint Academic Network (JANET) for the United Kingdom.³⁶ In 1991, adoption of the High Performance Computing Act led to the formation of the “information superhighway,” followed by release of the World Wide Web to public use.³⁷ The next major technical advance came in 1993 when the United States made TCP/IP its mandatory protocol, and the National Science Foundation Network (NSFNET) agreed to share its infrastructure with users. This formed the backbone of the United States Internet service.³⁸ Once the Internet became established, private business soon began incorporating it into the commercial community.³⁹ Likewise, the medical community, and in particular the specialty of diagnostic radiology, caught the wave of change by introducing the Internet into modern practice.

³⁰*Id.*

³¹*Id.*

³²*Id.* (explaining that in 1972, following the introduction of ARPANET to the public, Ray Tomlinson at BBN wrote the first electronic mail message send and read software which was followed by Lawrence G. Roberts writing the first e-mail program).

³³*Id.*

³⁴*Id.*

³⁵Griffiths, *supra* note 27 (noting that Stanford formed Telenet, City University New York had Bitnet, whereas the United States Department of Energy created MFENet that led to HEPNet followed by NASA forming SPAN for its space physicists).

³⁶*Id.*

³⁷*Id.*

³⁸*Id.*

³⁹*See* Leiner et al., *supra* note 26 (noting that vendors initially provided basic network products, and service providers gave connectivity services whereas now the Internet is treated as a “commodity” service with its informational structure supporting other commercial services that provide information and products globally).

B. Modern Medicine Catches the Wave into the Future

The application of telecommunication technology to the practice of medicine became known as “telemedicine,” which generally means the “use of telecommunication to diagnose and treat a patient.”⁴⁰ Telemedicine utilizes many different forms of communication technology depending upon the time and discipline of medicine involved.⁴¹ Currently, telemedicine touches many different aspects of modern medicine, and includes the areas of cybersurgery (surgery specialties), teleradiology (diagnostic radiology), and video and Internet/e-mail conferencing (medicine).⁴²

During the early years of the Internet, governmental agencies, such as the National Aeronautics and Space Administration (NASA), took the then-existing gains in computer and communication technologies and applied them to their medical needs.⁴³ NASA scientists made their first use of telemedicine during manned space flights, where they telemetrically monitored the physiologic functions of their astronauts during orbital missions.⁴⁴ Not only did the scientists at NASA employ this technology in space, but they put it to practical use here on earth when they aided the Indian Health Service during the 1970s. NASA supplied remote Indian tribes by establishing medical telecommunication networks between mobile practitioners and distant public health hospitals.⁴⁵ In the 1990s, NASA went international with its brand of telemedicine when it linked its facilities with its Russian counterparts through the international telemedicine project.⁴⁶

Since its early experiences in space, the United States government has taken satellite-based technology to natural disasters by providing space-linked communications to aid medical and relief workers worldwide.⁴⁷ Even the United States military has deployed telemedicine services during times of peace⁴⁸ and war.⁴⁹

⁴⁰Patricia C. Kuszler, *Telemedicine and Integrated Health Care Delivery: Compounding Malpractice Liability*, 25 AM. J.L. & MED. 297, 299 n.9 (1999).

⁴¹University of Iowa Hospitals and Clinics: Department of Radiology: Teleradiology, *Uses of Telemedicine*, <http://www.radiology.uiowa.edu/MoreRAD/Teleradiology/uses.htm> (last visited May 3, 2007).

⁴²See Kuszler, *supra* note 40, at 299-300.

⁴³See Charles R. Doarn et al., *Applications of Telemedicine in the United States Space Program*, 4 TELEMEDICINE J. 19, 19-20 (1998) (noting the applications of electronic monitoring in the space program beginning with the Mercury program).

⁴⁴See *id.* at 19-21.

⁴⁵*Id.* at 21-27 (describing the Space Technology Applied to Rural Pago Advanced Health Care project where physicians and physicians' assistants were connected remotely. The project, however, was beset with equipment problems, but it was nevertheless claimed as a success.).

⁴⁶*Id.* at 23-26.

⁴⁷V. Garshnek, *Applications of Space Communications Technology to Critical Human Needs: Rescue, Disaster Relief and Remote Medical Assistance*, 8 SPACE COMM. 311, 311-12 (1991).

⁴⁸Kathleen M. Vyborny, *Legal and Political Issues Facing Telemedicine*, 5 ANNALS HEALTH L. 61, 62 (1996).

Not only does the United States military utilize this technology, but foreign militaries, such as the British Defense Medical Service, take telemedicine services to distant lands and battles.⁵⁰ Even modern state prison systems take advantage of this technology in order to bring medicine to their prison populations.⁵¹ Now, the private medical sector utilizes this technology to link providers in remote locations with specialists at major medical centers and aids physician extenders with emergency triage services.⁵² Perhaps, the greatest impact of telemedicine is in rural America, where physicians are electronically consulting with specialists to bring specialized care to places never thought possible.⁵³ Therefore, it should be no surprise that telemedicine applications are increasing as the reach of the Internet expands.⁵⁴

III. DIAGNOSTIC RADIOLOGY EXPERIENCES THE WAVE OF CHANGE

A. *Advances in Digital Technology Drive Teleradiology*

Teleradiology is the one branch of telemedicine with the most experience in advanced applications of telecommunications technology to the practice of medicine.⁵⁵ The earliest documented transmission of teleradiology information may have occurred in Canada during the late 1950s.⁵⁶ In the 1960s, a United States hospital utilized a microwave link to exchange radiologic images between with one of its outpatient clinics.⁵⁷ Soon, military services⁵⁸ of both the United States⁵⁹ and

⁴⁹Dean E. Calcagni et al., *Operation Joint Endeavor in Bosnia: Telemedicine Systems and Case Reports*, 2 TELEMEDICINE J. 211, 211 (1996) (recounting the military use of telemedicine in the Balkans).

⁵⁰L. Jarvis & B. Stansberry, *Teleradiology: Threat or Opportunity?*, 60 CLINICAL RADIOLOGY 840, 840 (2005) (noting that the British Defence Medical Service has a comprehensive telemedicine program that employs teleradiology services to remote overseas locations).

⁵¹See Robert M. Brecht et al., *The University of Texas Medical Branch – Texas Department of Criminal Justice Telemedicine Project: Findings from the First Year of Operation*, 2 TELEMEDICINE J. 25, 25-26 (1996) (outlining the State of Texas's use of telemedicine in its prison system).

⁵²See Kuszler, *supra* note 40, at 303 (noting that Allina Health System of Minneapolis uses physician extenders to triage emergency patients through telemedicine consultation, and the University of North Carolina program not only uses telemedicine to provide pediatric cardiac consultations at area hospitals, but also the University has extended its telemedicine program to the University of Chile).

⁵³*Id.* at 303-04.

⁵⁴*Id.* at 302.

⁵⁵See M. A. Goldberg, *Teleradiology and Telemedicine*, 34 RADIOLOGIC CLINICS N. AM. 647, 647 (1996) (stating that “[t]eleradiology is by far the most mature of Telemedicine subspecialties, having benefited from more than two decades of focused research”).

⁵⁶A. Jultra, *Teleroentgen Diagnosis by Means of Videotape Recording*, 82 AM. J. ROENTGENOLOGY 647 (1959).

⁵⁷R. L. Murphy & K. T. Bird, *Telediagnosis: A New Community Health Resource*, 64 AM. J. PUB. HEALTH 113 (1974) (crediting Dr. Kenneth Bird of Massachusetts General Hospital with the interpretation of medical images sent from a clinic to the hospital via microwave transmission).

the United Kingdom began developing and then deploying teleradiology services to remote battlefields, where they could deliver specialized care to their wounded soldiers. Although the military made early use of this technology, the civilian public and private sectors quickly applied it to fill their patient care needs as computer and communication technologies advanced.⁶⁰

Rapid gains in digital and telecommunication technology set the pace of development and deployment of this technology throughout medicine. Today, most diagnostic radiologists rely heavily on digitally-based technologies, such as digital radiology, ultrasound, computed tomography, nuclear medicine imaging, and magnetic resonance imaging.⁶¹ Yes, the modern radiologist functions in a digital world, where digital images have replaced their hardcopy counterparts as systems, such as Laser Film Digitizers and Charged Coupling Devices, allow more image data to be digitized.⁶² Moreover, the exponential gains achieved in computer technology, such as increased data storage and transmission, data compression algorithms, and broader bandwidths, have allowed an increasing number of imaging modalities to enter the world of digital imaging. Now, hospitals and imaging departments are going “filmless” by utilizing picture archival communication (PAC) systems.⁶³

B. Diagnostic Radiology Goes Global with DICOM

One limitation in this filmless world of radiology is the ability of digital systems and their workstations to communicate with each other. Transmissions may occur via a local or a wide area network (LAN or WAN, respectively).⁶⁴ Digital imaging systems and workstations must be capable of interfacing so distant networks can communicate with each other, and the adoption of the Digital Image Communication in Medicine (DICOM) standard by both manufactures and countries is establishing greater connectivity.⁶⁵ Increased connectivity allows a radiologist sitting at a given

⁵⁸See Jarvis & Stansberry, *supra* note 50, at 840.

⁵⁹See Goldberg, *supra* note 55, at 648 (explaining that United States military uses teleradiology to offset the lack of radiologists and the need to limit the number of dangerous postings).

⁶⁰See Brian J. Bartholmai et al., *The Electronic Imaging Technology Specialist: The Role of a New Radiology Subspecialty for the 21st Century*, 15 J. DIGITAL IMAGING 184 (2002) (stating that advances in electronic imaging require the formation of a new specialty with training to meet the demand).

⁶¹Alexander R. Margulis & Jonathan H. Sunshine, Opinion, *Radiology at the Turn of the Millennium*, 214 RADIOLOGY 15 (2000).

⁶²D. A. Forsberg, *Quality Assurance in Teleradiology*, 1 TELEMEDICINE J. 107 (1995).

⁶³See Jarvis & Stansberry, *supra* note 50, at 841.

⁶⁴Mark Pliskin, *Fiber Optics: The Next level Up in Teleradiology*, http://www.versitron.com/telemedicine_teleradiology_solutions.html (last visited May 28, 2007).

⁶⁵See Steven C. Horii, Radiological Society of North America, *DICOM: A Nontechnical Introduction to DICOM*, <http://www.rsna.org/Technology/DICOM/intro/index.cfm> (last visited May 28, 2007) (noting that the American College of Radiology-National Electronic Manufacturers' Association standard that allowed only point-to-point connectivity led to the adoption of DICOM, which is extremely adaptable, and is compatible with the MEDICOM European standard, Comit  Europe en de Normalisation, and is partially adopted by the

workstation to send, receive, and manipulate any digital information from imaging studies at the click of a button or turn of a dial.⁶⁶ Not only do these workstations facilitate film reading and information transfer, but they also give its operators an opportunity to manipulate existing data sets in multiple ways, including 3D reconstructions. Manipulations resulting in 3D renderings of data may ultimately impact therapeutic decisions in such areas as radiation oncology and robotic surgery.⁶⁷ Because this information exists in a digitized format, any physician (including a diagnostic radiologist) sitting at home or abroad may download this information to her laptop or other PC devices for remote or delayed access.⁶⁸

Some see events taking place in the modern digital radiology department and health system as the forerunner of an "integrated health care enterprise."⁶⁹ PACs will serve as the connection point between a radiology information system (RIS) within a radiology department and the hospital information system (HIS) of the hospital it serves. Because PACs facilitate the sending, receiving, and accessing of information between RIS and HIS, they will also function as access points to other similar systems worldwide. Ultimately, global contact will come through the World Wide Web. And as these technologies reach more remote sites, some offsite radiologist may read digitized for radiologists when the onsite radiologist is unavailable.⁷⁰

C. Teleradiology Use Rises with the Digital Wave

As the costs for both data transmission and computer power drop, digitally driven radiology departments will realize the advantages of teleradiology.⁷¹ One driving force behind the utilization of this technology is the understanding on the part of physicians that most people want and need high quality digital images for an accurate medical diagnosis. In fact, most modern teleradiology screens display digital images with a good level of diagnostic quality.⁷² As broadband technology becomes more available, the transmission of large data files to imaging specialists will become almost instantaneous, which means experts may now give rapid diagnostic readings. In cases where general readings may be suspect or uncertain, specialists may be electronically summoned to over-read these films; theoretically,

Japanese Industry Association of Radiation Apparatus and the Medical Information Systems Development Center).

⁶⁶R. Nick Bryan, President's Address, *The Digital rEvolution: The Millennial Change in Medical Imaging*, 229 RADIOLOGY 299 (2003), available at <http://radiology.rsna.org/cgi/content/full/229/2/299> (last visited May 28, 2007) (reviewing the digital revolution occurring in the field of medical imaging where computed-assisted detection and diagnosis).

⁶⁷*Id.*

⁶⁸*Id.*

⁶⁹*Id.*

⁷⁰*Id.*

⁷¹See Margulis & Sunshine, *supra* note 61, at 16 (explain that cost reductions in technology have opened radiology departments to the practical opportunities of global teleradiology).

⁷²Pliskin, *supra* note 64.

this practice could reduce clinical errors and improve clinical outcomes.⁷³ Because teleradiology services may be delivered remotely, they can also be delivered round-the-clock, seven days a week at a reasonable cost.⁷⁴ The immediacy and availability of digital image transmissions also promotes both group consultations and opportunities for education and training from experts at remote locations.⁷⁵

Even so, teleradiology may have several negative impacts on the practice of clinical radiology as a discipline. Because teleradiology necessarily implies that a reading physician is remotely located, some fear that it will further erode the already distant relationship that exists between the radiologists and patients. Legally, the radiologist-patient relationship is viewed as an indirect one, where the radiologist generally does not directly order radiology studies nor does she deliver diagnostic information to the patient.⁷⁶ Some fear that the increased usage of teleradiology services may further reduce face-to-face meetings between patients and radiologists.⁷⁷ At least one legal commentator expresses concern regarding the potential loss of patient contact because the presence of well-formed physician-patient relationship is a key factor in reducing the likelihood of a medical malpractice action when medical mistakes are made.⁷⁸ An additional casualty related to the remoteness of the reading radiologist may be her ability to examine patients or monitor studies while they are in progress. Not only are these radiologists not on-site for active monitoring of radiology studies, but they also may be unavailable for clinical consultations with a referring physician.⁷⁹ This unavailability may further expose the teleradiology reading radiologist to medical malpractice actions.⁸⁰ Nevertheless, the presence and utilization of teleradiology services in the modern digitally driven radiology department continues marching toward a worldwide presence.⁸¹

⁷³*Id.*

⁷⁴See Margulis & Sunshine, *supra* note 61, at 16.

⁷⁵See Charles Levine et al., *Radiology Coverage 24/7—What Can We Do, Who Can We Call*, 10 EMERGENCY RADIOLOGY 119, 120 (2003) (discussing a teleradiology program formed between UMDNJ-New Jersey Medical School and Israel where an American-trained, Board Certified Diagnostic Radiologist in Israel served as the on-call consultant for United States based radiologists in-training in a residency training program during night-call beginning at 9 p.m. through 8 a.m. from Saturday through Thursday. The residents were satisfied with the level of training and contact). See also Pliskin, *supra* note 64.

⁷⁶Rebecca W. West, *Radiology Malpractice in the Emergency Room Setting*, 7 EMERGENCY RADIOLOGY 14, 15 (2000) (stating that “[t]he physician-patient relationship may be direct or indirect”).

⁷⁷See Margulis & Sunshine, *supra* note 61, at 16.

⁷⁸See West, *supra* note 76, at 15 (explaining that “[w]hen teleradiology is being used to connect a distant site with an interpreting radiologist, this remote relationship makes establishing a fiduciary relationship even more complex and difficult . . . and one of the most commonly recommended risk management tools to avoid being sued – that is, having a good personal relationship”).

⁷⁹See Margulis & Sunshine, *supra* note 61, at 16.

⁸⁰See West, *supra* note 76, at 15.

⁸¹See Margulis & Sunshine, *supra* note 61, at 16.

D. Costs and Radiology Labor Shortage Promotes Outsourcing

1. The Rising Costs in Imaging Promote Outsourcing

Although teleradiology technology is costly on the front end, prices are declining as computer and communication costs drop concomitantly.⁸² Nevertheless, the total costs for diagnostic medical imaging services are increasing, with the estimated cost in 2003 between two to three billion dollars, and higher costs are expected in the coming years.⁸³ The cost increases currently occurring in imaging are mirroring those in the overall health care system, which was estimated at 1.9 trillion dollars in 2004.⁸⁴ Even the federal government appreciates that the rising costs of imaging services impact the United States health care budget.⁸⁵ In fact, the rising cost of imaging services is beginning to affect staffing levels throughout America, especially in small radiology practices. These practices find it increasingly difficult to staff services to meet the rising work demand, especially for night and weekend coverage.⁸⁶ Salaries commanded by American radiologists continue to climb.⁸⁷ To offset rising costs, hospital and radiology practices are looking for novel ways to gain control.

Some United States hospital administrators saw an opportunity to gain control as well as a competitive advantage in their imaging markets by subcontracting (or outsourcing) radiology services to foreign reading services.⁸⁸ This practice is no different from the one currently utilized to deal with medical transcription and billing, both of which have opted to outsource work to reduce costs. Outsourcing of

⁸²Tina Hayward, *The Cost Effectiveness of Teleradiology at the Women's and Children's Hospital in Adelaide, South Australia*, <http://www.jma.com.au/teleradcosteffect.htm> (last visited May 28, 2007).

⁸³See Howard P. Forman, Policy Brief, *National Health Expenditures: Annual Update*, <http://www.ars.org/ScriptContent/air/Inpractice/policybrief.cfm> (last visited Mar. 10, 2006) (stating that the private sector economists estimate United States spending for imaging services in 2003 at nearly "\$200-\$250 billion, which is comparable to prescription drug spending").

⁸⁴*Id.*

⁸⁵Letter from James P. Borgstede, Chair, Board of Chancellors, American College of Radiology Association, to members of the American College of Radiology (Dec. 29, 2005) (warning that Congress voted to approve the Deficit Reduction Act of 2005 which would reduce the reimbursement on the "technical component to physicians performing physician office imaging services to the lesser of the Hospital Outpatient payment or the Medicare Fee Schedule payment. This provision will become effective January 1, 2007.").

⁸⁶Lindsey Tanner, *Medical Tests Add Outsourcing Twist*, 13 RECRUITING PHYSICIANS TODAY 1, 2 (2005) (reporting on medical outsourcing of radiology work to meet demand).

⁸⁷Carol K. Kane & Horst Loeblich, *Physician Income: The Decade in Review*, in AMERICAN MEDICAL ASSOCIATION: PHYSICIAN SOCIOECONOMIC STATISTICS 7 (2002 ed.) http://catalog.ama.org/MEDIA/ProductCatalog/m350028-PSStat_2003.pdf (last visited Mar. 12, 2006) (explaining reimbursement for all physician class from 1990 to 2000 and showing that radiologist had the highest median income in 2000 at \$289,000, which showed a real annual percent change from 1998 to 2000 of 9.1%).

⁸⁸See Jarvis & Stansberry, *supra* note 50, at 841.

these services to foreign markets is possible because much of the work is rules-based logic, which is easily transferred with minimal training.⁸⁹ Diagnostic radiology services may not, however, lend themselves to a massive movement of work overseas, as seen in the manufacturing or information technology (IT) sectors, because radiology reading relies on the pattern recognition skills of the reading radiologist.⁹⁰ Such skills require judgments be made during the reading of radiology images, which may act as barrier to outsourcing of these jobs to offshore markets.

Reimbursement issues related to offshore teleradiology service can be tricky, where some practices may be using these services to increase their revenues by reducing physician costs, while others maybe outsourcing to alleviate staffing shortages. Currently, the Medicare Physician Fee Schedule permits payment for teleradiology services performed by offshore radiologists only if it is treated as a preliminary reading, and it is also over-read.⁹¹ Theoretically, Medicare services pay for these asynchronous services in all fifty states because reading of studies generated and transmitted by teleradiology mirrors the standard of practice currently in place. Thus, an accredited radiologist reading radiology studies either generated in the United States and then either (1) read in the United States, or (2) preliminarily read abroad, and then officially over-read in the United States followed by issuance of a formal report, will be allowed reimbursement from Medicare.⁹² Although

⁸⁹McLean, *supra* note 1, at 216.

⁹⁰Frank Levy & Ari Goelman, *Offshoring and Radiology* (Massachusetts Institute of Technology Industrial Performance Center, Working Paper No. IPC-05-007, Sept. 2005), available at <http://web.mit.edu/ipc/publications/pdf/05-007.pdf> (discussing the difference between rules-based logic paradigms that lend themselves to computer manipulation, such as writing computer programs or software applications, as opposed to pattern recognition skills utilized to recognize disease).

⁹¹American College of Radiology (ACR), Teleradiology Q&A, http://www.acr.org/s_acr/sec.asp?TRACKID=&SID=1&VID=1&CID=3553&DID=22307&RTID=0&CIDQS=&Taxonomy=False (last visited Apr. 18, 2007) (explaining that preliminary interpretations from foreign based physicians are permissible under the Medicare Physician Fee Schedule if they are treated as a preliminary reading followed by an official reading from an accredited radiologist based in the United States).

⁹²Glenn W. Wachter, Telemedicine and Telehealth Articles, *Medicaid Reimbursement in 2000*, April 2000, http://tie.telemed.org/articles/article.asp?path=articles&article=medicaidReimbursement00_gw_tie00.xml; see also ACR, Teleradiology Q&A, *supra* note 91 (explaining that the Medicare Physician Fee Schedule excludes payment for services rendered from outside the United States, such as x-rays, but it will pay for preliminary or “wet readings” that are performed outside the United States and interpreted by an accredited radiologist within the United States or electronically generated within the United States including Puerto Rico, the Virgin Islands, American Samoa, Guam, and the Northern Mariana Islands; such formal reports that are generated are reimbursable and are excluded from telemedicine codes so services must be billed under existing radiology CPT codes). *But see* U.S. Department of Health & Human Services, EXECUTIVE SUMMARY, 2001 REPORTS TO CONGRESS ON TELEMEDICINE (Feb. 2001), <http://www.hrsa.gov/telehealth/pubs/report2001.htm> (indicating that the Balanced Budget Act of 1997 (BBA) expanded coverage options for telemedicine and required, at that time, the Health Care Financing Administration in 1997 to reimburse for telemedicine consultation services, but limitations existed and by 2000 only twenty state medicaid programs paid for telemedicine consultation).

reimbursement is theoretically available to the states, actual practice tells a different story.

For example, a recent survey of reimbursement for delivery of teleradiology services to pediatric population conducted by the Institute of Child Health Policy at the University of Florida reported that only two of twenty-four state Medicaid services reimburse for teleradiology services related to children under Title V.⁹³ Although this type of coverage is theoretically available for teleradiology services, it seems that many states do not necessarily reimburse for all teleradiology services. Even if physicians and hospitals do receive reimbursement for these services, the cost of imaging services may not fall because of the costs related to the technical component (which goes to the equipment and work needed to generate the images).⁹⁴ Although hospitals and small practices initially experience some reduction in physician costs, the true impetus for outsourcing likely comes from an abundance of work and insufficient staffing to meet demands, not reimbursement.⁹⁵

2. Misguided Planning Leads to Shortages of Radiologists

American radiology is currently experiencing a shortage of qualified radiologists, and the seeds for this shortage were sown in the early 1980s. During this period of time, the Graduate Medical Education National Advisory Committee (GMENAC) predicted that an excess of 70,000 physicians would hit the radiology job market by 1990, followed by another 137,000 physicians in 2000.⁹⁶ Unfortunately for the GMENAC, medical schools experienced an unexpected drop in their application pool, and fewer graduates from medical school entered specialty practice compared to those who sought primary care positions.⁹⁷ By 1990, the actual number of physicians entering practice was nearly fifteen percent less than what GMENAC predicted for this period.⁹⁸ Predictions of doom and gloom by the GMENAC did not come true. Not only did medicine see fewer physicians entering its ranks, but it also

⁹³Lise Youngblade et al., *Telemedicine for CSHCN: A State-by-State Comparison of Medicaid Reimbursement Policies and Title V Activities* (July 2005), http://telehealthconnections.ichp.ufl.edu/documents/Telemedicine_in_Medicaid_and_Title_V_Report.pdf (reporting results of a multistate survey which revealed twenty-two states reported state medicaid did not reimburse for telemedicine services, and of the twenty-four that did report it, only two reported reimbursement for teleradiology).

⁹⁴See Howard P. Forman, *Offshoring Teleradiology and the Future of Our Specialty*, <http://www.arrs.org/ScriptContent/air/Inpractice/policybrief.cfm>.

⁹⁵Dan Harvey, *Offshore Reading*, 6 *RADIOLOGY TODAY* 18 (2005), available at http://www.radiologytoday.net/archive/rt_053005p18.shtml (last visited Apr. 16, 2007) (stating that the ACR is not truly opposed to teleradiology practice since there is a "radiology workforce shortage and mushrooming number of images needing to be read" where the ACR believes teleradiology could allow for quality coverage on weekends and at night).

⁹⁶Joseph Hawkins, *Physician Employment in 2000 and Beyond*, 2000 *HOSPITAL PHYSICIAN* 74, 74 (quoting a summary of the report delivered by the Graduate Medical Education National Advisory Committee (GMENAC) of 1980).

⁹⁷*Id.* at 74-75.

⁹⁸Cynthia H. Deitch et al., *Recruiting Radiologists: The 1991 Hiring Survey*, 185 *RADIOLOGY* 47 (1992).

saw an upsurge in the popularity of the primary care areas with graduates from medical school. These events translated into fewer graduates entering specialty areas, such as diagnostic radiology. This shift in emphasis from specialty care to primary care may have been spurred by the Clinton health care reform initiative of the early 1990s.⁹⁹ The bottom line is the shortage predicted by GMENAC never materialized.

Not only did diagnostic radiology see fewer bodies enter the profession, but it also began seeing changes in its workforce due to the cost containment and reduced reimbursement associated with managed care. To counterbalance the effects of managed care, many private radiology practices began reducing the number of job openings for new graduates, fearing a loss of their practice income.¹⁰⁰ Conversely, older radiologists in these practices grew tired of the increased work demands imposed by managed care and sought retirement.¹⁰¹ Practice data collected over this time period reveals that radiologists experienced a 4.5 percent increase in workload from 1991-1992 and 1995-1996. Moreover, the number of radiology studies obtained on a given patient increased by eighteen percent.¹⁰² Unfortunately, self-imposed workforce reductions did not end with the retirement of senior radiologists.

Soon, younger radiologists who were approaching retirement age and no longer wished to work longer hours for less pay, began exiting the workforce through early retirement.¹⁰³ Replacements for these losses were not coming from radiology programs because the number of medical residents moving into the workforce held constant at roughly 1000 per year, as compared to an existing workforce that is 25,000 strong.¹⁰⁴ Added pressures on staffing came from referring physicians, who demanded coverage for service twenty-four hours a day, seven days per week, and from nonradiologist-physicians, who were willing and able to perform imaging studies.¹⁰⁵ In short, radiology found itself in the middle of a battle over imaging turf with other clinical specialties wishing to take their piece of the imaging market.¹⁰⁶

⁹⁹Hawkins, *supra* note 96, at 75 (explaining that the growth in primary care physicians exceeded the growth in specialty areas suggesting trainees went where they thought the jobs would be).

¹⁰⁰Anne M. Covey et al., *The Job Market in Diagnostic Radiology 1999*, 175 AM. J. ROENTGENOLOGY 957 (2000) (explaining that fears over the health care policy and reimbursement in the early 1990s caused groups to curtail hiring based on the theory that a reduced workload could be anticipated).

¹⁰¹S. D. Elliott et al., *Hiring of Diagnostic Radiologists in 1997*, 172 AM. J. ROENTGENOLOGY 885 (1999).

¹⁰²Covey et al., *supra* note 100.

¹⁰³*Id.*

¹⁰⁴Mythreyi Bhargavan et al., *Too Few Radiologists?*, 178 AM. J. ROENTGENOLOGY 1075 (2002).

¹⁰⁵Covey et al., *supra* note 100.

¹⁰⁶Margulis & Sunshine, *supra* note 61.

3. Global Staffing Shortages Create a Wave of Change in Practice

Not only were American radiologists experiencing staffing problems during this same period, but other countries, such as Australia¹⁰⁷ and the United Kingdom, saw similar shortages, while countries in the European Union reported excesses.¹⁰⁸ To counteract some of these problems in the United States, the groups with a small number of radiologists began consolidating as well as expanding their base by creating new openings, which went unfilled.¹⁰⁹ Other groups offset their staffing shortages by applying teleradiology technology to improve the productivity of their remaining radiologists. Currently, nearly seventy-one percent of United States-based, multi-member radiology practices have a teleradiology system in place, which is utilized primarily to cover their night-call responsibilities.¹¹⁰ These groups also used this technology for consultation with other radiologists as well as primary film interpretation.¹¹¹ In fact, the deployment of teleradiology technology was so pervasive that one American resident training program suggested that radiology training programs should institute an "Electronic Imaging and Technology" (EIT) fellowship program to ensure that radiologists could manage technology associated with teleradiology.¹¹²

Because of the ready availability of teleradiology services to most groups, some sought additional productivity gains by outsourcing their existing work, especially after hours, to other American groups utilizing this technology. Onshore outsourcing led to gains in productivity by allowing groups to keep their physicians fresh by doing away with after-hours responsibilities. This meant that productivity did not fall, because physicians did not have to take time off the day following night-call.¹¹³ One radiology group in Corpus Christi, Texas, for example, outsourced its work to a domestic outsource service known as M&S Radiology based in San Antonio, Texas,

¹⁰⁷D. N. Jones, Review Article, *2002 Australian Radiology Workforce Report*, 46 AUSTL. RADIOLOGY 231 (2002) (noting data collected from the Royal Australian and New Zealand College of Radiologists Workforce Survey 2000 and the report of the Australian Medical Workforce Advisory Committee Radiology Working Party 2001 came to the following conclusions: "(i) there is a current shortfall of radiologist supply in Australia; (ii) future requirements (taking all factors into consideration) are expected to grow at a greater rate projected supply (based on the status quo); and (iii) supply of radiologists should be increased. These conclusions are roughly in line with those from other countries, such as the U.K., Canada, and the U.S.").

¹⁰⁸Jarvis & Stansberry, *supra* note 50 (stating that the United Kingdom has an overall shortfall in consultants in clinical radiology, which is not reflected in its European Union counterparts).

¹⁰⁹Covey et al., *supra* note 100.

¹¹⁰David B. Larson et al., *A Comprehensive Portrait of Teleradiology in Radiology Practices: Results from the American College of Radiology's 1999 Survey*, 185 AM. J. ROENTGENOLOGY 24 (2005).

¹¹¹*Id.*

¹¹²*See* Bartholmai et al., *supra* note 60.

¹¹³Bhargavan et al., *supra* note 104.

which allowed them to meet their call demands.¹¹⁴ Because domestic outsourcing offers many advantages to radiology services that lack sufficient manpower, it is high likely that these practices will be the wave of the future. Other firms, however, have chosen a different path.

Some groups and hospitals have sought to outsource their work offshore by contracting with reading services in foreign countries, rather than relying on onshore reading services. These groups seek these services to achieve a competitive advantage over their competitors by reducing the workload, increasing the quality of care, and reducing costs.¹¹⁵ The precise number of hospitals and groups currently contracting with foreign practices remains uncertain. Some estimate, based upon the approximation that fifty percent of some 6000 United States hospitals have yet to acquire teleradiology services, that a huge market awaits foreign entrepreneurs.¹¹⁶ In 2003, some estimated that the three largest outsourcing firms were reading films for more than 1000 of some 5764 hospitals listed by the American Hospital Association.¹¹⁷ In fact, some believe that the market has been advancing at a rate that eclipses the one seen with the “wildcatting” era in the oil industry or the personal computer revolution.¹¹⁸

4. Outsourcing Models Begin to Shape the Wave of Change

As noted previously, American radiology groups employ two different types of teleradiology service providers: an onshore or domestically located service with readers somewhere in the United States, and an offshore or foreign-based service with readers reading films in other countries, such as Australia, Switzerland, China, India,¹¹⁹ and Israel.¹²⁰ In essence, suppliers may choose to operate under two business models, which may be divided based upon the location of the business. The predominant model has a domestic presence and employs American-trained

¹¹⁴L. A. Lorek, *His Patients Come First, Telemedicine Meets Service*, SAN ANTONIO EXPRESS-NEWS, Jan. 14, 2006, at 1D (stating that M&S Radiology provides teleradiology services through high-speed internet connections and voice recognition dictation systems to meet demand from United States based practices).

¹¹⁵Sajay Krishnan, *India to be Teleradiology Hub!*, (Apr. 26, 2005), <http://www.rediff.com/cms/print.jsp?docpath=/money/2005/apr/26inter.htm> (discussing the formation of teleradiology reading services in Bangalore, India, such as Teleradiology Solutions, that provide emergency and non-emergency film reading services to United States hospitals that fill the existing shortage of radiologists by supplying radiologists that are wide-awake and giving high quality readings in thirty minutes or less using communication lines established by telephone, satellite, or wide area network (WAN) connections for less cost).

¹¹⁶*Id.* (quoting an unnamed source as estimating the foreign outsourcing market at fifty percent of the 6000 hospitals that have yet to acquire teleradiology technology).

¹¹⁷Ari Goelman, *Spatial Structuring at Work: Comparing Physician Use of Computer Mediated Communication* (Massachusetts Institute of Technology Workplace Center, Working Paper No. WPC-0024, 2005), available at <http://web.mit.edu/workplacecenter/docs/wpc0024.pdf>.

¹¹⁸Harvey, *supra* note 95.

¹¹⁹*Id.*

¹²⁰See Levine et al., *supra* note 75.

radiologists, who are board certified by the American Board of Radiology, to read images from sites located either onshore or offshore. Thus, it is the location of the business operation that determines whether the business is a foreign or domestic provider, not the location of the radiologist reading the films.¹²¹ In some cases, domestic providers, such as M&S Radiology or Nightshift Radiologists,¹²² may only employ American radiologists to read locally generated imaging studies from United States facilities, and they have no physicians reading from an offshore location.¹²³ Alternatively, some American owned and operated businesses, such as Nighthawk Radiology Services of Coeur d' Alene, Idaho¹²⁴ and International Teleradiology Corporation,¹²⁵ relocate their radiologists to other countries to take advantage of the differences in time zones. These outsourcing services advertise that their physicians have medical malpractice insurance and are credentialed at all facilities; they have state-of-the-art teleradiology equipment and have rapid turnaround of reports, usually less than thirty minutes.¹²⁶ This sort of arrangement may also exist at American academic institutions, where they have established ties with institutions located in other countries to conduct clinical trials to evaluate the feasibility of offshore emergency readings. Again, the radiologists situated on foreign soil are American-trained and board certified, but the reader may¹²⁷ or may not be credentialed at the host site.¹²⁸

The second model is located entirely offshore. It is a service that is owned and operated completely on foreign soil, usually India or China.¹²⁹ One service, Teleradiology Solutions, was established by Arjun Kalyanpur, a graduate and member of the Yale University faculty.¹³⁰ Although his company is based in Bangalore, India, the readers at his site are composed of American-trained, Indian

¹²¹Harvey, *supra* note 95.

¹²²NightShift Radiology, <http://www.nightshiftradiology.com/services.htm> (last visited Apr. 16, 2007) (indicating that they are located in Montara, California, and install all their state-of-the-art equipment at local hospitals).

¹²³Lorek, *supra* note 114.

¹²⁴NightHawk Radiology Services, <http://www.nighthawkrad.net/> (last visited Apr. 16, 2007) (advertising their services on the internet as a United States based company founded by an American physician and located in Coeur d' Alene, Idaho with practice opportunities in Sidney, Australia, and Zurich, Switzerland).

¹²⁵International Teleradiology Corporation, <http://www.teleradiologyonline.com> (last visited Apr. 16, 2007) (indicating they are located in San Diego, California, with staff in the United States and Australia).

¹²⁶Harvey, *supra* note 95.

¹²⁷Arjun Kalyanpur et al., *Emergency Radiology Coverage: Technical and Clinical Feasibility of an International Teleradiology Model*, 10 EMERGENCY RADIOLOGY 115 (2003) (detailing a radiology call reading service established by radiologists trained and certified in the United States reading in Bangalore, India, films generated at Yale University Medical School where the reading radiologist had credentials).

¹²⁸Levine et al., *supra* note 75.

¹²⁹Harvey, *supra* note 95.

¹³⁰Krishnan, *supra* note 115.

radiologists. The chief advantage of the Bangalore operation to United States-based firms is low cost and the presence of a highly skilled IT support infrastructure.¹³¹ A variant of this practice dynamic is the service that employs foreign radiologists who are not American-trained from India and China. This latter setup, although profitable to the stateside business, is less feasible, less workable, and not widely used.¹³²

In 2003, the actual number of American-trained radiologists reading from foreign soil was uncertain, but one estimate put the number at no more than one hundred, and of that number, less than three were in India. In comparison, there are an estimated 30,000 radiologists in the United States, so the actual effect on the labor pool is negligible for now.¹³³ Moreover, a survey from private community hospital radiology practices in the United States revealed that nearly eighty percent of the practices with responsibilities for night coverage utilized teleradiology services that were domestically focused, with less than fifteen percent opting for foreign-based readers.¹³⁴ Thus, based on the numbers, it is unlikely that any job occupied by an American radiologist is eminently threatened by offshore practices.¹³⁵ Even if offshore practices were to pose a threat to American radiology practices, there may be additional barriers that would serve to check losses to foreign markets that include recommendations and practice guidelines issued by professional societies, state licensing requirements and credentialing issues, medical malpractice jurisdictional concerns, and privacy law issues.

IV. BARRIERS IMPEDE THE WAVE OF CHANGE HEADING TOWARD RADIOLOGY

A. Professional Guidelines May Form a Barrier

The American College of Radiology (ACR) is the leading organization for most, if not all, radiologists in the United States. This organization focuses on making diagnostic imaging safe, effective, and accessible to individuals who need it.¹³⁶ The ACR is concerned primarily with the quality of care delivered during radiology services, and it accomplishes its mission by promulgating practice guidelines for its

¹³¹*Id.*

¹³²Harvey, *supra* note 95.

¹³³Tracie L. Thompson, *Thrall Cites Risks of Outsourcing in RSNA Opener*, (Nov. 28, 2004), <http://www.auntminnie.com/index.asp?sec=sup&sub=pac&pag=dis&ItemId=65633> (quoting from a presentation given by Dr. James H. Thrall, radiologist-in-chief at Massachusetts General Hospital in Boston on the Globalization of Radiology: Myths and Reality given at the 90th annual RSNA meeting in Chicago, Illinois).

¹³⁴Daniel D. Saketkhoo et al., *Emergency Department Image Interpretation Services at Private Community Hospitals*, 231 *RADIOLOGY* 190, 193 (2004).

¹³⁵Thompson, *supra* note 133.

¹³⁶American College of Radiology (ACR), About Us, http://www.acr.org/s_acr/sec.asp?CID=2561&DID=17606 (last visited Apr. 16, 2007) (providing the mission statement for organization composed of 30,000 members that include radiologists, radiation oncologists, medical physicists, interventional radiologists, and nuclear medicine physicians).

membership and the medical community.¹³⁷ In the past, this organization has voiced its concerns over the increasing trend toward the use of teleradiology services to outsource medical imaging from the United States to offshore. This organization, however, has not expressly stated its desire to completely prohibit such practices, especially since the current labor shortage in the workplace has no immediate relief in sight.¹³⁸ Even so, members of the most recent task force have outlined multiple recommendations that could clearly hinder outsourcing of imaging work to foreign markets, especially those imaging services with an offshore base of operations. That committee incorporated the teleradiology practice guidelines into its recommendations, which were issued by the ACR in May 2005.¹³⁹ Although the ACR clearly states that the primary purpose of all its guidelines is the promotion of good medical care, not the promulgation of a legal standard, they do provide guidance for good practice, which gives them force among its members.¹⁴⁰

Its teleradiology guidelines consist of multiple specific criteria that a practicing radiologist must meet in order to provide what the ACR considers to be quality service. For example, the ACR recommends that the physician participating in reading of teleradiology studies should render an official, written report, if he or she reads a particular study.¹⁴¹ This could certainly serve as a barrier to any foreign readers who may read studies without issuing an official report, which is also called “ghosting.” By definition, ghosting occurs when a radiologist or some other person interprets the image and then issues a report that is officially signed by a non-reading radiologist.¹⁴² It is unclear just how many services actually perform ghosting. The guidelines also address common sense issues, such as the need for personnel at the transmitting site who are qualified to perform the study and the existence of a

¹³⁷American College of Radiology (ACR), *Statement on the Interpretation of Radiology Images Outside the United States*, http://www.acr.org/s_acr/bin.asp?TrackID=&SID=1&DID=22336&CID=3553&VID=2&DOC=File.PDF (last visited Apr. 16, 2007) (promulgating the standards that it believes a physician who interprets these images where certification by the American Board of Radiology is the best means to let the health care consumer be able to judge the qualifications of the radiologists).

¹³⁸Harvey, *supra* note 95 (noting that following the Report of the ACR Task Force on International Teleradiology found that teleradiology could aid access to quality radiologic interpretation at night and during the weekends—times the shortages impact the most).

¹³⁹Erik L. Ridley, *ACR International Teleradiology Task Force Releases White Paper*, (Feb. 15, 2005), <http://www.auntminnie.com/index.asp?Sec=sup&Sub=pac&Pag=dis&ItemId=65397> (discussing the recommendations of the task force of the ACR and release of its overseas guidelines in May 2004).

¹⁴⁰AMERICAN COLLEGE OF RADIOLOGY, *ACR TECHNICAL STANDARD FOR TELERADIOLOGY*, (Oct. 1, 2005), http://www.acr.org/s_acr/bin.asp?TrackID=&SID=1&DID=12292&CID=541&VID=2&DOC=File.PDF (stating that the practice guidelines are an educational tool to assist practitioners with providing appropriate radiologic care, for they are not inflexible rules).

¹⁴¹*Id.*

¹⁴²Jonathan S. Batchelor, *European, Australian, and U.S. Radiologists React to Outsourced Diagnostic Imaging Interpretation*, (Mar. 8, 2005), <http://www.auntminnie.com/index.asp?sec=ser&sub=def&pag=dis&ItemId=65633> (reporting on comments made by Dr. James P. Borgstede, chair of the ACR Board of Chancellors regarding patient safety with respect to the practice of teleradiology).

reading radiologist who is capable of performing quality control at that site.¹⁴³ The ability of physicians to perform quality control might be perceived as a barrier, especially if the physician resides thousands of miles away from the location in which the image was made. It is not likely that the physician in that case will be able to effectively perform quality control.

The ACR also has several recommendations within its guidelines, any one of which could serve as an absolute bar to offshore readers, even if the physician has American training and American Board of Radiology (ABR) certification. First, the ACR recommends that the reading physician maintain a license in the state where images originate and where the images are interpreted.¹⁴⁴ Second, it recommends that a physician who interprets images originating from a hospital should have undergone peer review or a credentialing process at the hospital where images originate as well as at the arrival site.¹⁴⁵ Finally, the reading radiologist should have sufficient medical malpractice insurance to cover any acts of negligence at either the receiving or transmitting sites.¹⁴⁶ Clearly, any of these recommendations, although they are not official rules or laws, could make it extremely difficult for a foreign offshore reader to comply with the practice guidelines.

Notwithstanding these recommendations, the ACR guidelines contain additional recommendations that may qualify as barriers to offshore reading. One potential barrier relates to image storage requirements, where the ACR recommends that the storage of images at either site should meet the jurisdictional requirements of the transmitting site. The site storing the images, whether it is the transmitting or receiving facility, must also store them in accordance with the jurisdictional requirements of the transmitting facility. Clearly, this recommendation could push an offshore site to meet requirements that may be more onerous than its normal jurisdictional requirements, but in some cases they may actually be less onerous.¹⁴⁷ More likely than not, a receiving facility would be forced to store images for the longer of the two jurisdictional requirements, when they are significantly different. Its guidelines further recommend that facilities create policies and procedures for quality control.¹⁴⁸ This guideline would likely not impose too great of a barrier on offshore sites, unless it caused an offshore facility to redo their existing policies or procedures. The guideline on security could create potential problems for a receiving facility outside the United States, especially Europe. Of course, the ACR guideline recommends that systems should provide both network and software security to protect confidentiality of personally identifiable health information, but it recommends that the facilities meet both federal and state legal requirements.¹⁴⁹ This may not be a problem, unless the facility is in Europe, where countries have

¹⁴³ACR TECHNICAL STANDARD FOR TELERADIOLOGY, *supra* note 140.

¹⁴⁴*Id.*

¹⁴⁵*Id.*

¹⁴⁶*Id.* See also ACR, *Statement on the Interpretation of Radiology Images Outside the United States*, *supra* note 137.

¹⁴⁷ACR TECHNICAL STANDARD FOR TELERADIOLOGY, *supra* note 140.

¹⁴⁸*Id.*

¹⁴⁹*Id.*

their own privacy acts, which may be more comprehensive.¹⁵⁰ Ultimately, facilities may be forced into a situation where they have to comply with the individual privacy laws for multiple countries.

B. The Law May Block the Offshore Wave

Although guidelines and regulations promulgated by national organizations may hinder, and in some instances, block the practice of reading studies offshore, there are multiple federal, state, and local regulations that may also act either independently or concomitantly with other laws to effectively block the offshore teleradiology practice. In general, the goal of most, if not all, regulatory schemes related to health care in the twenty-first century is the protection of patients as consumers.¹⁵¹

With respect to the practice of teleradiology services, state licensure laws may have the greatest impact on offshore reading of radiology studies. In general, states may choose to enact a specific statute to regulate the practice of telemedicine within its borders, and then by extension, the statute may apply teleradiology. Or, states may rely on sister states to regulate teleradiology practice, choosing to remain silent. Alternatively, states may rely on a professional licensure statute or a medical practice act to regulate practice from across its borders.¹⁵² In 2001, at least twenty-six states had laws to regulate out-of-state physicians who practiced telemedicine within their state.¹⁵³ Because teleradiology services come under the definition of telemedicine, it is very likely that the radiologist will need to be aware of the licensure scheme utilized within the state.¹⁵⁴

Conversely, federal regulations may also indirectly regulate the offshore practice of teleradiology by governing the purse through limitations on Medicare or Medicaid reimbursements,¹⁵⁵ or it may regulate through measures related to the quality of

¹⁵⁰Jarvis & Stansberry, *supra* note 50.

¹⁵¹Timothy S. Jost, *Oversight of the Quality of Medicare: Regulation, Management, or the Market?*, 37 ARIZ. L. REV. 825, 849-58 (1995) (discussing the factors and the roles they play in contributing to the assurance of the quality of medical care that include: 1) the generation and dissemination of information to inform the consumer-patient; 2) the importance of culture (professionalism) and environment for fostering quality care; 3) the need for incentives such as money, recognition, power, independence, or anything considered valuable to a professional or institution to promote quality; 4) the need for sanctions, however marginal their role maybe, in promoting quality; and 5) the need for systems to identify errors so they may be eliminated).

¹⁵²Alison M. Sulentic, *Crossing Borders: The Licensure of Interstate Telemedicine Practitioners*, 25 J. LEGIS. 1, 19-21 (1999) (discussing the two regulatory schemes most commonly employed by the states to control the practice of telemedicine and teleradiology which is a subcategory of telemedicine).

¹⁵³EXECUTIVE SUMMARY, *supra* note 92 (noting by 2001 about twenty-six states regulated the out-of-state practice of telemedicine).

¹⁵⁴Kuszler, *supra* note 40, at 299 (defining telemedicine as the use of telecommunications to diagnose and treat patients where it includes different technologies such as teleradiology).

¹⁵⁵ACR, *Teleradiology Q&A*, *supra* note 91.

medical care, such as the Health Care Quality Improvement Act.¹⁵⁶ It may also choose to regulate through entities, such as the Food and Drug Administration (FDA) and the Center for Devices and Radiologic Health (CDRH).¹⁵⁷ Even the Federal Trade Commission (FTC) has played a major role in regulating the practice of telemedicine, and by extension, it might be able to extend its reach to cover teleradiology services.¹⁵⁸ Physicians practicing teleradiology, however, are not currently subject to any federal medical licensure laws that directly regulate the practice of medicine or teleradiology services.

Regulatory efforts may also arise at the local level, where state or county medical societies may try to regulate quality by affecting the standing of the professional through peer review processes.¹⁵⁹ Local societies, however, are unlikely to have any significant impact on the practice of teleradiology from foreign-based offshore operations. Unlike the state or federal regulatory agencies, these societies lack the force of law, but they can still serve as partial barriers to teleradiology practice. Thus, the primary regulatory barriers to the offshore practice of teleradiology, whether these practices occur between states or from foreign shores, will be state-based laws with federal law playing a lesser role.

1. Licensure Schemes Represent a Significant Barrier

States have always retained the power to regulate the practice of medicine within their borders based on the powers granted to them under the United States Constitution.¹⁶⁰ The United States Supreme Court in *Dent v. West Virginia* affirmed the ability of a state, under the Tenth Amendment, to control the practice within its borders.¹⁶¹ In that case, a practitioner brought suit against the state board of health, which had ruled that the medical diploma he held was not reputable, and thus, he was not qualified to practice within the state.¹⁶² The Court explained that a person did not have the right to practice medicine without a license, which serves as notice to the community that the person possesses the requisite learning and skill to practice. It further said that a license was the means whereby the public received assurance that

¹⁵⁶Jost, *supra* note 151, at 833-34 (noting that federal initiatives, such as the Health Care Quality Improvement Act of 1986 where professional review action requires reporting to the National Practitioner Data Bank for professional review actions that adversely effects the clinical privileges of a physician under 42 U.S.C. § 11133(a)(1)(A)).

¹⁵⁷See EXECUTIVE SUMMARY, *supra* note 92 (noting that the FDA and CDRH may regulate telemammography by controlling personnel, regulating standards, practices, and procedures).

¹⁵⁸*Id.*

¹⁵⁹Jost, *supra* note 151, at 839-40 (noting that self-regulation by professionals has been criticized by commentators for being reluctant to discipline their colleagues).

¹⁶⁰U.S. CONST. amend. X (stating that “[t]he powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people”).

¹⁶¹Sulentich, *supra* note 152, at 2 (citing the decision from *Dent v. West Virginia* as affirming the right of states to regulate certain occupations, such as medicine, in order to protect the general welfare of the people of a given state).

¹⁶²*Dent v. West Virginia*, 129 U.S. 114, 120-21 (1889).

the physician was competent.¹⁶³ Moreover, the Court noted that the state had the power to regulate for the general welfare of its people and protect them from the “consequences of ignorance and incapacity as well as of deception and fraud.”¹⁶⁴ Thus, states retain the power to regulate the practice of medicine within their borders through licensure statutes that establish a minimum level of competence.¹⁶⁵

States may also regulate the entry of physicians into practice by granting or withholding the issuance of a license to a requesting physician. States may control the scope of practice by defining the practice of medicine under its licensing laws.¹⁶⁶ Licensure laws control the entry to practice by ensuring that physicians wishing to practice within a given state have the necessary qualifications to practice, such as graduating from an accredited school of medicine or osteopathy, passing the federal licensing exams, such as the United States Medical Licensure Exam, obtaining some clinical experience that at a minimum would include residency training, and verifying the good character of the requesting physician.¹⁶⁷

Unfortunately, a private accreditation body, not the licensing board of the particular state considering the granting of a license, reviews many of these requirements.¹⁶⁸ Moreover, most boards lack the necessary means to independently review and verify the credentials of a future licensee, especially if the prospective licensee is a foreign-trained physician.¹⁶⁹ Not only are boards unable to independently verify credentials, but also the passing scores achieved by candidates on medical licensing exams may not adequately predict the clinical competence of the candidate.¹⁷⁰ Neither a passing score nor a failing score may necessarily predict the actual clinical capabilities of a prospective licensee.¹⁷¹ Clearly, state boards have a vested interest in jealously guarding the borders from incompetent physicians. As such, physicians who wish to practice teleradiology from an offshore site, which also requires them to cross the border of the state, may find that entry into practice in the transmitting state through licensure is both difficult and costly.¹⁷²

¹⁶³*Id.* at 122-23.

¹⁶⁴*Id.* at 121-22.

¹⁶⁵Jost, *supra* note 151, at 861 (noting that licensure does “not give perfect assurance of competence,” but it does, in most cases, assure that the physician possessing one has the basic qualifications to practice medicine).

¹⁶⁶Sulentic, *supra* note 152, at 6-7.

¹⁶⁷*Id.* at 7-8.

¹⁶⁸Jost, *supra* note 151, at 860-61.

¹⁶⁹*Id.* at 861.

¹⁷⁰*Id.* at 862-63 (discussing the limitations of licensure experienced by the state medical boards, and inadequacy of the licensure process for ensuring prospective licensees will deliver quality care within a given state).

¹⁷¹Sulentic, *supra* note 152, at 6-7 (noting that most candidates taking licensing exams pass them, and yet, some of these physicians do not deliver quality care whereas some physicians who do poorly or pass following repeated attempts, successfully practice medicine).

¹⁷²*Id.* at 23 (noting that advocates for telemedicine criticize a full licensure scheme because it is costly and outweighs incentives to acquire it).

States also effectively guard their borders against the unauthorized practice of medicine by either a physician or nonphysician by choosing a broad definition of what constitutes the practice of medicine within the state.¹⁷³ States may effectively control the scope of practice within their borders by crafting either broad or narrow definitions of the acts, which constitute the practice of medicine within its borders.¹⁷⁴ Not only can a nonlicensed physician violate the scope-of-practice language, but the language may also catch a provider who possesses a valid license to practice within the state, depending upon the breadth of the definition of the practice of medicine.¹⁷⁵ Thus, a radiologist wishing to provide services, whether she comes from a neighboring state or a foreign country, may violate the scope-of-practice portion of the practice act, even if she holds a valid license within her host state.¹⁷⁶

Since teleradiology is considered a subset of telemedicine,¹⁷⁷ any radiologist wishing to read teleradiology images must perform a three-part analysis prior to reading any images from the transmitting state. First, the radiologist must determine if the state requires a license for the activity she wishes to perform. Second, the radiologist must evaluate the nature and effect of the electronic medium that will be used and its impact on whether a license is required. Once the radiologist has determined that a license is required, she must determine the scope-of-practice within the state she intends to read films.¹⁷⁸ Any misstep in this three-part analysis can have serious consequences for the radiologist.

Failure of the radiologist to properly analyze state licensure laws may subject the radiologist to a Class A misdemeanor under the Medical Practice Act within a given state, regardless of harm to the patient. If the violations are repetitive or result in physical or psychological harm to another person, then the offending radiologist may be looking at a third-degree felony.¹⁷⁹ Depending on the state, the offending radiologists may also be liable for additional infractions, such as aiding and abetting the practice of medicine. If the state determines that the radiologist did practice without a license and her acts or omissions led to the injury of another, she could be

¹⁷³Lori B. Andrews, *The Shadow Health Care System: Regulation of Alternative Health Care Providers*, 32 HOUS. L. REV. 1273, 1279-1301 (1996) (explaining that at least twenty jurisdictions use an all encompassing definition of acts that require a medical license whereas others focus on treatment which creates a more narrow definition, and thus greater latitude for practice of some acts without a license).

¹⁷⁴Sulentic, *supra* note 152, at 10 (pointing out that courts that uphold convictions for the unauthorized practice of medicine focus on essentially two questions: 1) did the person possess a medical license, and 2) if the person did not, then did the person perform diagnosis and/or treatment).

¹⁷⁵*Id.* at 9. See also Andrews, *supra* note 173, at 1300.

¹⁷⁶Sulentic, *supra* note 152, at 9-10.

¹⁷⁷Kuszler, *supra* note 40, at 299 (defining telemedicine as the use of telecommunications to diagnose and treat patients, where it includes different technologies such as teleradiology).

¹⁷⁸Sulentic, *supra* note 152, at 11-12 (laying out a three-part analysis for a telemedicine practitioner which must be performed in order to avoid violations of the medical practice act related to the unauthorized practice of medicine).

¹⁷⁹*Id.* at 9-10.

prosecuted for a state felony.¹⁸⁰ Clearly, the radiologist who practices medicine without a license or practices outside the scope of medicine while conducting an offshore practice could be heading into a professional disaster if caught and convicted. Thus, state licensure laws may serve as a complete bar to the offshore practice of medicine.

In general, states have been responding primarily to the practice of telemedicine by out-of-state physicians.¹⁸¹ Several different licensure schemes have been proposed to help regulate the practice of telemedicine by physicians:¹⁸² (1) a statutory consultation exception as in California,¹⁸³ Hawaii,¹⁸⁴ West Virginia,¹⁸⁵ and Puerto Rico;¹⁸⁶ (2) mutual recognition as in Colorado;¹⁸⁷ and (3) formal telemedicine licensure as in Minnesota,¹⁸⁸ Mississippi,¹⁸⁹ Montana,¹⁹⁰ New Mexico,¹⁹¹ and Tennessee.¹⁹² Some states, on the other hand, have chosen to enact statutes that specifically address the practice of teleradiology by treating it as a practice of medicine. For example, New Hampshire provides that the practice of teleradiology by any out-of-state radiologist on a New Hampshire patient “shall be deemed to be in the practice of medicine and shall be required to be licensed under this chapter.”¹⁹³ On the contrary, Oklahoma has created a separate office, the Oklahoma Center for Telemedicine, to promote telemedicine activities within the state. Its State Board of Health promulgates the rules related to teleradiology responsibilities, though, which coincidentally “shall be based on the American College of Radiology Standards for

¹⁸⁰*Id.* at 10-11.

¹⁸¹See EXECUTIVE SUMMARY, *supra* note 92 (noting in 2001 at least twenty-six states had enacted legislation to address the practice of telemedicine).

¹⁸²Dean R. Batson, *Pennsylvania's Abortive Attempts to Regulate Telemedicine Through Restrictive Licensure Requirements: Protecting the Patient or Protecting the Profession*, 106 DICK. L. REV. 591, 604-14 (2002) (describing the seven proposed licensure schemes for the regulation of telemedicine as (1) statutory consultation exception, (2) full licensure through endorsement, (3) mutual recognition, (4) reciprocity, (5) registration, (6) limited or special licensure, and (7) a federal licensure system).

¹⁸³CAL. BUS. & PROF. CODE § 2060 (Deering 2006).

¹⁸⁴HAW. REV. STAT. § 453-2 (2005) (providing an exemption for a commissioned medical officer who consults with a licensed physician of the State, but otherwise, an out-of-state physician must hold a medical license in Hawaii).

¹⁸⁵W. VA. CODE ANN. § 30-3-13 (LexisNexis 2006).

¹⁸⁶P.R. LAWS ANN. tit. 20, §§ 6001-6004 (2004).

¹⁸⁷COLO. REV. STAT. § 24-60-3103 (2005).

¹⁸⁸MINN. STAT. § 147.091 (2005).

¹⁸⁹MISS. CODE ANN. § 73-25-34 (2005).

¹⁹⁰MONT. CODE ANN. § 37-3-301 (2005).

¹⁹¹N.M. STAT. ANN. § 61-6-11.1 (LexisNexis 2006) (repealed 2010).

¹⁹²TENN. CODE ANN. § 63-6-209 (2005).

¹⁹³N.H. REV. STAT. ANN. § 329:1-b (LexisNexis 2005).

Teleradiology.”¹⁹⁴ However, Massachusetts has adopted legislation to target a specific area of radiology, neuroimaging, which may employ teleradiology services.¹⁹⁵ Oregon takes a different approach to teleradiology by creating a specific license for teleradiology.¹⁹⁶ Meanwhile, Texas has formally defined teleradiology¹⁹⁷ and exempts it from the direct face-to-face requirement.¹⁹⁸

Because states may address the practice of teleradiology through different statutory means and definitions, the offshore radiologist wishing to practice in those states must be aware of these specific sections. For example, New Hampshire clearly specifies what qualifies as the unauthorized practice of medicine within its borders. Other states are increasingly likely to develop more formal rules as teleradiology practices become more common. Failure to specifically address them could lead to criminal sanctions. Even so, it is equally likely that boards may become more flexible as they become familiar with the practice of both telemedicine and teleradiology. Eventually, state boards may realize the potential benefits associated with teleradiology services, which can reach many areas in need of these services.¹⁹⁹

2. State Negligence Law May Act as a Barrier

One of the major hindrances to the outsourcing of teleradiology studies, either onshore or offshore, is the status of medical negligence law. Today, the existence of negligence law is a major concern since some argue that the United States medical community is in the midst of a medical malpractice crisis that causes physicians to practice defensive medicine. Data and recent publications have cast doubts on whether such a crisis truly exists.²⁰⁰ In most medical negligence cases, physicians become subject to legal action through their acts or omissions that fall below the standard of care for the jurisdiction in which the act was committed.²⁰¹ This scenario

¹⁹⁴OKLA. STAT. tit. 63, § 1-2702(A)(2) and (D) (2005).

¹⁹⁵105 MASS. CODE REGS. 130.1406 (2006) (providing that prompt delivery of neuroimaging services shall be available in the hospital or through remote access, e.g. teleradiology, but Massachusetts appears to have no other regulatory sections related to practice outside of the state).

¹⁹⁶OR. ADMIN. R. 847-005-0005 (2006) (requiring a registration fee for active teleradiology licenses of \$219 per year).

¹⁹⁷1 TEX. ADMIN. CODE § 354.1430 (2006) (explaining that “[t]eleradiology is a means of electronically transmitting radiographic patient images and consultative text from one location to another”).

¹⁹⁸1 TEX. ADMIN. CODE § 354.1432(a)(1) (2006).

¹⁹⁹Sulentic, *supra* note 152, at 36-37.

²⁰⁰Claire Osborn, *Malpractice Insurance; Lawsuits Didn't Rise; Costs Did, Study Says; 'Blockbuster' Verdicts Didn't Grow, It Argues*, AUSTIN AM.-STATESMAN, Mar. 10, 2005, at B1 (citing recent study of medical malpractice claims data from 1988-2002 showing no change in payouts greater than \$25,000, and a substantial decline in those less than \$25,000; the response from the medical establishment was defensive stating the study “cooked” the data).

²⁰¹MARK A. HALL, MARY A. BOBINSKI & DAVID ORENTLICHER, *MEDICAL LIABILITY AND TREATMENT RELATIONSHIPS* 367-71 (Aspen Publishers 2005) (discussing ordinary negligence and the “Hand Formula” and defensive medicine); *see also* West, *supra* note 76, at 14 (citing radiology claims data from Illinois that indicate the number of lawsuits involving radiology

is the same for all physicians, including a radiologist.²⁰² Although radiologists do get sued, a study in 1996 revealed that a total of six claims were made related to the practice of telemedicine or teleradiology, all of which dealt with misdiagnosis.²⁰³ The current number of filings is uncertain, but negligence cases related to a misdiagnosis involving teleradiology do occur.²⁰⁴

The paradigm for medical negligence cases related to teleradiology may cover a host of possibilities that include, but are certainly not limited to, the failure to make a correct diagnosis, failure to communicate a diagnosis, and a failure of the technology.²⁰⁵ Although some of these potential acts or omissions may not be new to the medical negligence landscape, the addition of a new or developing technology could open the door to other avenues for litigation. Concerns over the potential for litigation, especially with respect to teleradiology and offshore reading, are echoed in the ACR guidelines, where ACR has recommended that its radiologists have adequate medical malpractice insurance coverage before reading teleradiology studies to cover for the risks and twists associated with litigation.²⁰⁶

a. State Medical Malpractice Law Impacts Teleradiology Readers

The risks are real, but the twists may not be as great as one might expect considering the technology and practice involved. In fact, the issues related to telemedicine practice and consultation may be less straightforward, with respect to state law, than those associated with teleradiology practice, either domestic or foreign.²⁰⁷ The issue that will likely cause the most concern is the determination of the negligence claim and the court with proper jurisdiction.

As with any medical negligence case, the plaintiff must run through the standard medical negligence paradigm of the particular jurisdiction in which the injury

during a twenty-year period reveals that the decade of the 1990s showed claims against radiologists remained relatively stable).

²⁰²West, *supra* note 76, at 14-15.

²⁰³Jill Lynn Tyler, *The Healthcare Information Technology Context: A Framework for Viewing Legal Aspects of Telemedicine and Teleradiology*, 5 Proceedings of the 34th Hawaii International Conference on System Sciences, (2001), http://www.hicss.hawaii.edu/HICSS_34/PDFs/HCTMD01.pdf (last visited Apr. 18, 2007) (pointing out that in 1996 a report made by the Physician Insurers Association of America cited only six liability claims, which the Radiologic Society claimed were based on misdiagnosis).

²⁰⁴See Papach, *ex rel*, *Haws v. Mercy Suburban Hosp.*, 887 A.2d 233, 238-39 (Pa. 2005) (discussing a medical negligence action brought against a radiologist for failing to detect a subdural hematoma missed on images transmitted to a portable teleradiology system for home use during night call).

²⁰⁵See Jarvis & Stansberry, *supra* note 50, at 843-44.

²⁰⁶See ACR TECHNICAL STANDARD FOR TELERADIOLOGY, *supra* note 140, at 710 (stating that “[t]hese physicians [interpreting teleradiology studies] should consult with their professional liability carrier to ensure coverage in both the sending and receiving sites (state or jurisdiction)”).

²⁰⁷See generally Kuszler, *supra* note 40, at 307-26 (discussing medical negligence theory in general and distinguishing medical negligence associated with telemedicine practice from teleradiology practice).

occurred.²⁰⁸ To avoid summary judgment and receive a favorable verdict, the plaintiff must establish the existence of a physician-patient relationship,²⁰⁹ the appropriate standard of care owed by the physician to the patient in the jurisdiction in which the act or omission occurred,²¹⁰ and that the act or omission proximately caused (cause-in-fact and foreseeable) the alleged injury to the plaintiff.²¹¹ Each of these steps may require the plaintiff to deliver expert testimony, especially if the matters related to these areas are outside the common knowledge of the jury.²¹² In some states, such as Texas, the plaintiff may have to navigate specific statutory requirements,²¹³ which some believe pose such high hurdles that success is unlikely.²¹⁴

All malpractice cases begin by requiring the plaintiff to establish the existence of a physician-patient relationship in order to create a duty, on the part of the physician, to treat or deliver reasonable care to the patient.²¹⁵ If a relationship cannot be established, then the physician is under no duty to treat the plaintiff, and the cause of action dies.²¹⁶ The physician must either affirmatively agree to be the physician for the plaintiff²¹⁷ or do some affirmative act that indicates a formal relationship exists, whether the physician is the primary provider of care or a consultant.²¹⁸ The required act is generally viewed within some temporal boundary where multiple physicians may become involved over time.²¹⁹ Unlike the conventional face-to-face relationship

²⁰⁸See West, *supra* note 76, at 14-15.

²⁰⁹Lection v. Dyll, 65 S.W.3d 696 (Tex. App. 2001).

²¹⁰Mathis v. Bocell, 982 S.W.2d 52 (Tex. App. 1998) (stating that the plaintiff must prove by competent medical evidence that the defendant did or did not do what other health care providers exercising ordinary care would not have done or that the provider failed to do what should have been done under the same or similar circumstances).

²¹¹Rehabilitative Care Sys. of Am. v. Davis, 43 S.W.3d 649 (Tex. App. 2001) (holding that the plaintiff's proof of a causal connection between an allegedly negligent act and their injury must be based on a reasonable medical probability, not mere conjecture, speculation, or possibility).

²¹²See Kuszler, *supra* note 40, at 307-08. See also Spinks v. Brown, 103 S.W.3d 452 (Tex. App. 2002); see, e.g., Lopez v. Carrillo, 940 S.W.2d 232 (Tex. App. 1997).

²¹³TEX. CIV. PRAC. & REM. CODE ANN. §§ 74.001-74.507 (Vernon 2005) (replacing TEX. REV. CIV. STAT. ANN. art 4590i, repealed by the Act of June 2, 2003, 78th Leg., R.S., H.B. 4, §§ 10.01 et seq.).

²¹⁴Claire Osborn, *Mom Settles Seton Malpractice Lawsuit Without a Lawyer, Woman Reaches Agreement with Hospital over Death of 18-year-old Son*, AUSTIN AM. STATESMAN, Dec. 18, 2004, at B1 (describing the story of a mother who brought a *pro se* cause of action against a hospital and its doctors because she could not get a law firm to take the case due to the new chapter 74).

²¹⁵See St. John v. Pope, 901 S.W.2d 420, 424 (Tex. 1995).

²¹⁶Salas v. Gamboa, 760 S.W.2d 838, 841 (Tex. App. 1988).

²¹⁷See Hurley v. Eddingfield, 59 N.E. 1058 (Ind. 1901).

²¹⁸See Oritz v. Shah, 905 S.W.2d 609, 611 (Tex. App. 1995).

²¹⁹Weaver v. Univ. of Mich. Bd. of Regents, 506 N.W.2d 264, 365-66 (Mich. Ct. App. 1993) (defining the care of a patient by a physician over time).

of a brick-and-mortar practice, the practice of telemedicine may be more dynamic. Courts may analyze the existence of a physician-patient relationship based on prior case law dealing either with telephone conversations or the process of consultation.²²⁰

In the case of teleradiology, the courts will likely focus on the issue of consultation where the court will view the radiologist as a consultant.²²¹ The process of consultation may be viewed as a formal one where the primary provider directly sends a patient to another provider for diagnosis or care. Once a relationship is established, the primary provider may be bound to follow the advice rendered by the consultant. Alternatively, consultation may be informal where the primary provider discusses patient care with another provider, usually a medical expert, to obtain an opinion on a diagnosis or advice about treatment. The patient may never actually see the consultant or know that one has been contacted unless the patient receives a bill from the consultant.²²² The radiologist during clinical practice can be either a primary provider or a consultant, but in most cases, the latter will apply, as the radiologist will read the images of the patient without ever meeting the patient in person.²²³ If the radiologist reads a teleradiology study, more likely than not, the radiologist will form an indirect physician-patient relationship.²²⁴ An indirect relationship is one where the consulting radiologist never actually meets, sees, or discusses the results of her reading or findings with a patient.²²⁵ The physician-patient relationship is a relationship born from an express or implied consent of the patient through the process of consultation with a referring physician.²²⁶ In some jurisdictions, a patient need not even know the identity of the consultant who was directing her primary care at the time of an alleged malpractice event.²²⁷ Thus, the

²²⁰See Kuszler, *supra* note 40, at 308-10.

²²¹*Id.* at 310-11.

²²²*Id.* at 308-10.

²²³*Id.* at 309-11.

²²⁴See West, *supra* note 76, at 15 (explaining that a physician-patient relationship may be a direct one, where the physician and patient actually meet face-to-face, whereas an indirect relationship can form when the patient and physician never see each other and the physician does not formally examine the patient, as is the case when a radiologist is consulted by another physician to read the images of the patient without ever meeting the patient).

²²⁵*Id.*

²²⁶*Gilinsky v. Indelicato*, 894 F. Supp. 86, 92 (E.D.N.Y. 1995) (identifying the probative factors that indicate the existence of a physician-patient relationship in the form of a consultation where neither the patient nor the physician ever meet, where formation of a relationship may depend on the extent to which a consulting physician exercises their professional judgment and the foreseeability that the judgment of the consultant would ultimately determine the precise nature of medical services to be rendered to the patient). See also *Walters v. Rinker*, 520 N.E.2d 468 (Ind. Ct. App. 1988) (finding the existence of a physician-patient relationship even though the pathologist never met, saw, or treated the patient while reading the pathology specimen of the patient; the pathologist read the case with either the expressed or implied consent of the patient and read on behalf of the patient); see, e.g., *Phillips v. Good Samaritan Hosp.*, 416 N.E.2d 646, 649 (Ohio Ct. App. 1979).

²²⁷*Gilinsky*, 894 F. Supp. at 93.

plaintiff should have no difficulty establishing that a physician-patient relationship has formed once a radiologist reads a teleradiology study pertaining to the patient.

The next step in the process requires the plaintiff to establish the standard of care applicable to the reading radiologist, which also requires the plaintiff to determine proper jurisdiction, especially in those cases where the physician is reading between states or from a foreign country. The proper standard of care must be established to know the degree to which the radiologist owed a duty of care to the patient, the breach of which proximately caused an injury to the patient.²²⁸ Courts will usually apply one of three different standards of care depending on the jurisdiction of the court. Historically, the locality rule has been the standard most often applied in medical negligence cases.²²⁹ United States jurisdictions applying the locality rule have generally defined it as the “duty to exercise ‘the same degree of diligence and skill which is commonly possessed by other members of the profession who are engaged in the same type of practice in similar localities having due regard for the state of scientific knowledge at the time of treatment.’”²³⁰ At least one court requires an “exercise of that degree of care, skill and diligence which physicians in the same general neighborhood and in the same general line of practice ordinarily possess and exercise in like cases.”²³¹ Some jurisdictions restrict the scope of the locality rule by using a “strict locality” or “locality plus” rule, which requires that the defendant be compared to members from “the same community as the defendant.”²³² The rational basis for this refinement goes to the differences in practice that are related to community-based differences.²³³

Still other jurisdictions hold expert physicians to the national standard of care where a physician is under a “duty to use the degree of care and skill that is expected of a reasonably competent practitioner in the same class to which he or she belongs, acting in the same or similar circumstances.”²³⁴ Thus, a radiologist who reads teleradiology studies named in a medical negligence action may be subjected to a standard of care that may vary depending on the jurisdiction where the negligent act was allegedly committed. It is highly likely that the radiologist will be held to a higher standard, such as the national standard of care.²³⁵

If the higher or more universal national standard of care is adopted by the jurisdiction faced with teleradiology-based negligence actions, debates over the applicable standard of care could be avoided. If the negligent act related to teleradiology occurs in the same state or domicile of the patient, either the standard of care for that jurisdiction will apply or the court might choose to apply the higher

²²⁸See Kuszler, *supra* note 40, at 317-19.

²²⁹*Id.* at 315.

²³⁰DiFranco v. Klein, 657 A.2d 145, 148 (R.I. 1995) (quoting Wilkinson v. Vesey, 295 A.2d 676 (R.I. 1972)).

²³¹Fitzmaurice v. Flynn, 356 A.2d 887, 891 (Conn. 1975) (quoting Snyder v. Pantaleo, 122 A.2d 21 (Conn. 1956)).

²³²Sheeley v. Memorial Hosp., 710 A.2d 161, 165 (R.I. 1998).

²³³*Id.*

²³⁴*Id.* at 167.

²³⁵See Kuszler, *supra* note 40, at 315.

one.²³⁶ The more thorny issue will come when the radiologist receives a transmitted study from state (A) that was read in state (B) or foreign country (C). This border-crossing scenario has already been visited in matters related to state licensure and telehealth. Courts facing such a case of first impression in teleradiology may attempt to establish the proper jurisdiction of an offshore-based medical negligence case by using an approach advocated by some Canadian commentators for telehealth practices.²³⁷ Under the Canadian scheme, the telecommunication portal transports the patient, electronically, to the province or territory of the jurisdiction of the physician, which is known as the physician-center locus.²³⁸ Conversely, the electronic portal may beam the physician to the jurisdiction of the patient, as the patient-centered locus of accountability approach.²³⁹ Although Canada favors the former approach, this approach, unfortunately, has received mixed reviews in the United States.²⁴⁰ The ACR, for example, has simply suggested that a physician be licensed and accountable in the jurisdiction where images are generated and where they are transmitted for reading.²⁴¹ Under their plan, a physician who holds a license in the state of image generation as well as the state of image destination and reading would be subject to the jurisdiction of both states. Even so, some may still question the basis of jurisdiction in medical negligence cases related to teleradiology on the basis of insufficient contacts, where the images are beamed from one location to a radiologist who receives and reads the films in a jurisdiction where the patient does not reside. Although the issue of proper jurisdiction over a teleradiologist could be a tricky one, it may not be as problematic as some believe.

Even though a specific case dealing with jurisdictional issues related to negligent reading of teleradiology studies at offshore sites does not yet exist, it may be only a matter of time before such a case arises. If such a case comes before a court, it will likely borrow from existing Internet case law dealing with advertising, patent, and contract cases. The cases dealing with diversity questions related to Internet contracts may be particularly helpful since many United States jurisdictions treat the physician-patient relationship as a contract.²⁴² If an American plaintiff is injured by a radiologist from another state or a foreign nation through teleradiology reading, the proper jurisdiction needs to be identified for filing of the case. If the case involves a

²³⁶*Id.*

²³⁷See Raymond W. Pong & John C. Hogenbirk, *Licensing Physicians for Telehealth and Practice: Issues and Policy Options*, 8 HEALTH L. R. 3, 7-8 (1999), available at http://www.law.ualberta.ca/centres/hli/pdfs/hlr/v8_1/Telehealth.pdf (last visited Apr. 18, 2007) (explaining that an alternative way to handle licensure issues to telehealth practice may be based on focusing on the locus of accountability using a physician or patient centered approach).

²³⁸*Id.*

²³⁹*Id.*

²⁴⁰*Id.* at 7 (noting that the United States Health Care Financing Administration approved of the approach of physician's jurisdiction as the locus of accountability approach, but most medical organizations did not).

²⁴¹See ACR TECHNICAL STANDARD FOR TELERADIOLOGY, *supra* note 140, at 712-13.

²⁴²See Kuszler, *supra* note 40, at 308-10.

nonresident of the state, it is an issue of diversity and destined to hit a federal court.²⁴³ The federal court in the jurisdiction of the resident plaintiff will likely obtain power,²⁴⁴ if the resident state has a long-arm statute that permits it to assert jurisdiction. Once jurisdiction is asserted, it comports with due process under the United States Constitution.²⁴⁵

The court may exercise its power under state law through its exercise of either personal or general jurisdiction.²⁴⁶ Personal jurisdiction is a concept based on the premise that the nonresident defendant has or had “minimum contacts” within the state, and the injury arose out of those contacts.²⁴⁷ Contacts, however, must not be random;²⁴⁸ the defendant must purposefully enter the forum state. Establishment of minimum contacts is achieved through facts that support either specific or general jurisdiction.²⁴⁹ General jurisdiction, however, requires that the defendant have “continuous and systematic” contacts with the forum state.²⁵⁰ Moreover, absence of the defendant in the forum state is not determinative,²⁵¹ and it is this concept that is a key feature of Internet cases. In most Internet cases the defendant is absent from the forum and exists virtually within the state through electronic contacts.²⁵²

Courts faced with diversity issues related to the Internet base their analysis on the type of interaction between the Internet site and the forum state as a “sliding scale,” from a totally passive site to a very interactive one.²⁵³ If the Internet site is a purely

²⁴³Michael L. Rustad & Thomas H. Koenig, *Harmonizing Cybertort Law for Europe and America*, 5 J. HIGH TECH. L. 13, 23-24 (2005) (noting that foreign defendants are entitled to due process in United States courts, but the traditional approach to establishing jurisdiction under minimum contacts based on the Internet may not be useful, and a new approach is needed).

²⁴⁴*Giotis v. Apollo of the Ozarks, Inc.*, 800 F.2d 660, 664 (7th Cir. 1986).

²⁴⁵*Trintec Indus., Inc. v. Pedre Promotional Prods., Inc.*, 395 F.3d 1275, 1277 (Fed. Cir. 2005).

²⁴⁶*See Rustad & Koenig, supra* note 243, at 23-24.

²⁴⁷*Int'l Shoe Co. v. State of Wash.*, 326 U.S. 310, 316 (1945) (following proper notice a court may obtain jurisdiction over an absent defendant as long as it does not offend the notions of fair play and substantial justice).

²⁴⁸*Keeton v. Hustler Magazine, Inc.*, 465 U.S. 770 (1984).

²⁴⁹*Helicopteros Nacionales de Columbia, S.A. v. Hall*, 466 U.S. 408 (1984); *see also Rustad & Koenig, supra* note 243, at 20-21.

²⁵⁰*See Helicopteros Nacionales de Columbia*, 466 U.S. at 408.

²⁵¹*See Burger King Corp. v. Rudzewicz*, 471 U.S. 462 (1985).

²⁵²*See Rustad & Koenig, supra* note 243, at 23-24.

²⁵³*Zippo Mfg. Co. v. Zippo Dot Com, Inc.*, 952 F. Supp. 1119, 1123-26 (W.D. Pa. 1997) (explaining that business can travel around the world using the Internet and that a court may exercise its jurisdiction based upon its determination of the level of interactivity and commercial nature of the exchange); *see also Rustad & Koenig, supra* note 243, 23-24 (noting the variation in application to the “sliding scale” approach where courts may look to more factors than mere Internet access and interactivity where a virtual presence does not establish personal jurisdiction).

passive one, such as the mere posting of material on a web page, courts may likely dismiss the case for lack of jurisdiction, but if the site actively downloads files from or to the forum state, sufficient contacts exist for the assertion of jurisdiction.²⁵⁴ Some courts, on the other hand, have disapproved of the sliding scale approach and have formulated an approach based upon “effects.”²⁵⁵ Thus, courts may see interactivity as one component in the analysis, where general jurisdiction arises from the continuous and systematic contacts by the Internet site, and specific jurisdiction arises when contacts between the Internet site and the forum state lead to a substantial connection.²⁵⁶

For example, the court in *Hy Cite v. Badbusinessbureau.com* formulated the effects test and denied jurisdiction of the forum state over a foreign company where the only contact of the company with the forum state arose from its web site, which posted consumer complaints about a company within the forum state.²⁵⁷ The plaintiff in that case tried to assert personal jurisdiction based on one person who bought a book within the forum state.²⁵⁸ The mere presence of a web site, its postings, and a single book sale were insufficient to create a nexus that did not offend the traditional notions of fair play and substantial justice.²⁵⁹ The court reasoned that web sites are accessible to anyone, which could subject an Internet company to a suit by any resident, in any jurisdiction, regardless of the degree of connectivity.²⁶⁰ The court believed this was impermissible.

In the case of the radiologist who negligently reads a teleradiology study, it is likely that the federal court of the forum state will be able to gain jurisdiction under either test. Teleradiology involves the transmission of data files between connecting sites such that interpretations are made, reports are generated, and images are stored and retrieved.²⁶¹ Because of the nature of a radiology practice, the mere reading of studies will create a physician-patient relationship, even if it is only an indirect one.²⁶² Reading services also send advertisements into the state to solicit business.²⁶³ An analogous situation may be found in *Mayo Clinic v. Jackson*, where a Texas

²⁵⁴Rustad & Koenig, *supra* note 243, at 23-24.

²⁵⁵*Hy Cite Corp. v. Badbusinessbureau.com, L.L.C.*, 297 F. Supp. 2d 1154, 1160-61 (W.D. Wis. 2004) (declining to follow the sliding scale because it was not clear why interactivity of a web site should be determinative of personal jurisdiction, and they questioned under what authority the court in that case adopted the test); *see also Zippo Mfg. Co.*, 952 F. Supp. at 1119.

²⁵⁶*Hy Cite Corp.*, 297 F. Supp. 2d at 1161.

²⁵⁷*See generally id.*

²⁵⁸*See generally id.*

²⁵⁹*Id.* at 1161-62.

²⁶⁰*Id.* at 1162.

²⁶¹*See* ACR TECHNICAL STANDARD FOR TELERADIOLOGY, *supra* note 140, at 709-11, 713.

²⁶²*See* West, *supra* note 76, at 15.

²⁶³*See* Harvey, *supra* note 95.

resident filed a malpractice suit against a Texas physician and the Mayo Clinic.²⁶⁴ The Clinic filed a special appearance to contest jurisdiction, asserting that the cause of action did not arise out of any contacts the organization had with the state.²⁶⁵ The court affirmed the ruling by the trial court that overruled the special appearance of the Clinic.²⁶⁶

In that case, a Texas resident sued the Mayo Clinic in Rochester, Minnesota, for acts of medical negligence. The plaintiff traveled to the Clinic in Minnesota after his physician made a referral to the Clinic.²⁶⁷ The Clinic supported its contention that Texas did not have jurisdiction because the Clinic was located in Minnesota, not Texas; the Clinic provided care only to individuals who came to its facilities; it did not maintain a place of business in Texas; it did not pay Texas taxes; and the Clinic was not required to maintain an agent for service of process.²⁶⁸ To counter the claim that the plaintiff lacked jurisdiction, the plaintiff showed that the Clinic recruited people from Texas for employment, sent a newsletter into Texas, treated nearly 1229 Texas residents between 1992 and 1996, maintained a toll-free telephone number, and had a web site that provided detailed information about the Clinic and how a patient could contact the Clinic.²⁶⁹ The court found that jurisdiction was obtained based on its active solicitation of Texas residents through its web site and toll-free telephone number.²⁷⁰ Although the Clinic challenged the Internet contacts based on its belief that it acted as a passive site, the court side-stepped the issue of Internet law and declared that it was the same as print media advertising.²⁷¹ The court then said the Clinic had created sufficient contacts through its recruitment of physician employees and that the continuous and systematic treatment of Texas residents were sufficient to establish general jurisdiction through “continuous and systematic contacts.”²⁷²

Not only did the court establish that the Clinic had “minimum contacts,” but the court also found these contacts did not offend the notions of fair play and substantial justice because its activities took place in Texas, and the Clinic reaped benefits from those activities.²⁷³ Based on this case, it is likely, at least in Texas, that a radiologist or any teleradiology reading service who solicited teleradiology readings on Texas residents and had electronic contacts with Texas, and any teleradiology reading service who employed or recruited employees from Texas would satisfy a contacts analysis for the purposes of due process. Thus, concerns regarding issues related to

²⁶⁴See *Mayo Clinic v. Jackson*, No. 05-98-00225-CV, 1998 Tex. App. LEXIS 6307, at *15 (Tex. App. Oct. 9, 1998).

²⁶⁵*Id.*

²⁶⁶*Id.*

²⁶⁷*Id.* at *1.

²⁶⁸*Id.* at *2, *6.

²⁶⁹*Id.* at *9-10.

²⁷⁰*Id.* at *7.

²⁷¹*Id.* at *9.

²⁷²*Id.* at *12.

²⁷³*Id.* at *13.

jurisdiction may be real, but any challenges to offshore reading related to an inability to obtain jurisdiction may be overcome under the existing framework for jurisdictional analysis with or without an Internet law analysis.

Even if jurisdiction is established, it is left to the court and the parties to determine the choice of law applicable to a medical malpractice case. The choice of law issue may be applicable where the defendant physician resides in a sister state or a foreign country. This issue applies to any case related to telemedicine from outside the forum state.²⁷⁴ Unfortunately, states employ different schemes to settle choice of law issues.²⁷⁵ States may use approaches such as *lex delecti*, Restatement of Law, “center of gravity” approach, or interest analysis. Others may consider policy, and still others may take the *lex fori* approach.²⁷⁶ In New York, for example, the court uses the “center of gravity” or locus of the contacts related to the injury approach.²⁷⁷ The court looks at factors that form the most significant relationship, such as domicile, residence, nationality, and locus of the relationship of the parties.²⁷⁸ Alternatively, some states and countries, such as Australia, employ the *lex loci delicti* or the place of the tort approach.²⁷⁹ Still others may opt for the *lex fori* approach, which use the law of the jurisdiction where the tort action is brought.²⁸⁰

Obviously, the parties in a medical malpractice case arising from the practice of telemedicine can find choice of law conflicts if the parties come from different jurisdictions that also use different choice of law schemes.²⁸¹ To resolve these conflicts before disputes, participants in teleradiology reading services should consider creating and adopting forum selection clauses.²⁸² Precedent exists for the use of contracts to select the jurisdiction for arbitration.²⁸³ Perhaps, services using offshore readers could craft similar language on the front of radiology request slips that patients could read. Thus, parties could agree before a dispute where and whose law should apply in case a dispute arises.

²⁷⁴See P. Greg Gulick, *The Development of a Global Hospital is Closer Than We Think: An Examination of the International Implications of Telemedicine and the Developments, Uses and Problems Facing International Telemedicine Programs*, 11 *IND. INT’L & COMP. L. REV.* 183, 209-11 (2000) (explaining the variations in modern conflict and choice of law rules that may determine the law of the case).

²⁷⁵*Id.* at 210 (explaining that jurisdictions across the United States use different schemes to analyze choice of law problems and may become more confusing where medical malpractice actions are concerned).

²⁷⁶*Babcock v. Jackson*, 191 N.E.2d 279, 282 (N.Y. 1963).

²⁷⁷*Id.*

²⁷⁸See Gulick, *The Development of a Global Hospital*, *supra* note 274, at 209.

²⁷⁹*Id.* at 210.

²⁸⁰*Id.*

²⁸¹*Id.*

²⁸²*Rustad & Koenig*, *supra* note 243, at 29-31.

²⁸³See *Carnival Cruise Lines, Inc. v. Shute*, 499 U.S. 585 (1991), *superseded by statute*, 46 U.S.C. § 30509 (2006), *as recognized in* *Yang v. M/V Minas Leo*, No. 94-15168, 1996 U.S. App. LEXIS 2235 (9th Cir. Jan. 26, 1996) (enforcing a contractual agreement to arbitrate printed on the reverse side of a ticket and seeing no contract of adhesion).

Even so, parties with such agreements may find them unenforceable, especially those that might be posted on a web site.²⁸⁴ This issue might be avoided if the parties use the radiology request slip, where the patient could manifest assent through agreeing to be imaged and decline by refusing to take the study. If the party declines the study, the radiology service must then be ready, willing, and able to refer the patient to an alternative site to receive proper care. If teleradiology imaging services adopt this approach, it would likely give all parties reasonable notice and satisfy notions of fair play and substantial justice. Thus, the barriers posed from choice of law and jurisdictional conflicts could be minimized or removed.

b. Corporate Negligence Theory May Impede Offshore Reading

Although much of the focus of the current discussion has focused on the role and relationship of offshore practice to an individual patient or plaintiff to a radiologist, current offshore operations involve companies and groups of radiologists.²⁸⁵ Hospitals or groups of radiologists may contract with teleradiology service providers.²⁸⁶ Thus, the lines of liability could become very blurry if the teleradiology reader is part of a larger business or corporation. Plaintiffs may be able to reach an electronically focused business or corporation through theories of vicarious liability or direct corporate liability.²⁸⁷

Currently, vicarious liability applies to those negligent acts performed by an agent, usually a hospital employee, on behalf of its principal, usually a health care organization such as a hospital.²⁸⁸ In general, hospitals and managed care organizations are able to escape this liability because physicians, such as radiologists, are considered independent contractors.²⁸⁹ If, however, the physician is an employee of one of these organizations, then courts may hold the organization vicariously liable.²⁹⁰ Courts have been willing to extend liability to negligent acts under the theory of respondeat superior if the hospital “supervises” or “controls” the

²⁸⁴Rustad & Koenig, *supra* note 243, at 31-33 (explaining that courts in recent cases, such as *Williams v. America Online, Inc.*, may rule online forum selection clauses unenforceable because the participants have no way to manifest assent to a contract posted on a web site).

²⁸⁵See McLean, *supra* note 1, at 240-43 (explaining that groups of radiologists may be placed offshore in Europe and other countries to take advantage of time zone differences and low volume hospitals may find it more economical to contract with corporations such as Teleradiology solutions to provide overnight coverage).

²⁸⁶See Harvey, *supra* note 95 (noting multiple different business models that employ radiologists to read studies offshore and these business may be located here and abroad).

²⁸⁷See Kuszler, *supra* note 40, at 319-26 (explaining the applications of vicarious liability and direct liability to hospitals and their potential applications to telemedicine).

²⁸⁸Barbara A. Noah, *The Managed Care Dilemma: Can Theories of Tort Liability Adapt to the Realities of Cost Containment?*, 48 MERCER L. REV. 1219, 1238 (1997) (discussing the applications of vicarious liability to hospitals and physicians they employ).

²⁸⁹See Kuszler, *supra* note 40, at 319-26.

²⁹⁰See Noah, *supra* note 288, at 1238-39.

physician.²⁹¹ If the physician is an independent contractor, an organization may still be held liable under the theory of ostensible agency if the injured party can show that it looked to the organization not the physician for treatment, that the organization held the physician as one of its employees, and that the patient then relied to his or her detriment.²⁹² It is unclear how a court might respond to one of these theories of vicarious liability if it was applied to an offshore teleradiology firm and its employees. It is likely that most patients will not even realize their studies are being read by an organization outside of the place they went to for the imaging study. Certainly, the ostensible agency is not likely to extend liability to the teleradiology reading service.

Direct liability to a health care organization, such as a hospital, is generally accomplished through theories related to nondelegable duty or corporate negligence.²⁹³ The theory of nondelegable duty is rarely employed against hospitals or other health care organizations.²⁹⁴ In fact, plaintiffs may focus on the theory of corporate negligence so that they may invoke the theory of a nondelegable duty against the defendant hospital or organization.²⁹⁵ The corporate negligence doctrine holds the hospital liable for not maintaining a proper standard of care owed to the patient.²⁹⁶ A hospital owes the patients four duties: (1) a duty to use reasonable care in maintaining its facilities and equipment, (2) a duty to select and maintain competent physicians, (3) a duty to oversee those that practice medicine within its walls, and (4) a duty to formulate, adopt, and enforce policy and rules that ensure patient safety.²⁹⁷ Courts still use this theory to extend liability to health care organizations.²⁹⁸

Whether this theory of liability can be extended to offshore teleradiology services has not been tested. It seems that this theory might be applied if the offshore teleradiology service supplied faulty equipment that led to a failure of transmission of data. The offshore reading service might be negligent if the failure in transmission leads to an improper diagnosis or delayed reporting that causes an injury to the patient.²⁹⁹ Whether any of these theories will apply remains to be seen, but if one does occur, the ability of the plaintiff to gain jurisdiction should not be a problem based on the foregoing analysis.

²⁹¹Klippel v. Rubinstein, 300 N.Y.S.2d 553 (N.Y. App. Div. 2002) (stating that a hospital will be held vicariously liable for the negligence of a physician if it is shown that the hospital had control or supervision).

²⁹²See Noah, *supra* note 288, at 1240-41.

²⁹³See Kuszler, *supra* note 40, at 321-24.

²⁹⁴*Id.*

²⁹⁵Thompson v. Nason, 591 A.2d 703, 707 (Pa. 1991) (stating that liability related to a nondelegable duty owed by a hospital to the patient arises from the theory of corporate negligence).

²⁹⁶*Id.*

²⁹⁷*Id.*

²⁹⁸See Kuszler, *supra* note 40, at 321-24.

²⁹⁹*Id.* at 324-26 (discussing a possible scenario where a technology failure might lead to an application of corporate negligence theory).

C. Language Proficiency May Be a Potential Barrier

The language of choice utilized in reporting may not be an issue, unless there is an inability to communicate information. Thus far, most offshore reading services have employed radiologists with American training, and most of the teleradiology work has been domestically located, with less than fifteen percent going overseas.³⁰⁰ Moreover, teleradiology services using offshore sites in foreign countries have either relocated American-trained domestic radiologists or employed American-trained foreign nationals who wish to return to their native country.³⁰¹ Even so, some commentators, especially in the United Kingdom, have voiced concerns over the potential for non-English speaking radiologists from radiologist-rich European countries who become offshore readers.³⁰² The lack of proficiency in English skills could create problems in the proper communication of findings to referring physicians.³⁰³

Here in the United States, these concerns should not be idle ones because a radiologist who fails to communicate findings may be sued.³⁰⁴ Courts have found that a radiologist has the duty to communicate findings and that a failure to communicate a diagnosis could be as important as the diagnosis.³⁰⁵ Thus, it seems that radiologists who are assigned the task of reading films for an offshore service should be proficient with the English language. Otherwise, any deficiency that leads to a failure of the radiologist to communicate a diagnosis that results in an injury hurts the patient and promotes litigation.

D. Confidentiality Concerns May Raise Barriers to Teleradiology Services

Adherence to the myriad of confidentiality laws by an offshore reading service may be problematic at best. In order to be compliant, it is important for both the reader and the service to be aware of the controlling law of the jurisdiction. The essence of their responsibility is to ensure that personal health information is seen only by those permitted.³⁰⁶ To protect security and maintain confidentiality, the ACR guidelines specify that teleradiology networks must have systems and software in place to protect the identity of the patient and imaging data in a manner consistent with both federal and state law.³⁰⁷ In the case of United States federal law, this

³⁰⁰See Thompson, *supra* note 133.

³⁰¹*Id.*

³⁰²See Jarvis & Stansberry, *supra* note 50, at 844.

³⁰³*Id.*

³⁰⁴Fowerbraugh v. Univ. Hosp., 692 N.E.2d 1091, 1096 (Ohio Ct. App. 1997) (noting that a physician has a duty to communicate based on the facts and circumstances of the case and failing to do so creates liability for a resulting injury).

³⁰⁵Philips v. Good Samaritan Hosp., 416 N.E.2d 646, 648 (Ohio Ct. App. 1979).

³⁰⁶R. E. Ashcroft & P. R. Goddard, *Ethical Issues in Teleradiology*, 73 BRIT. J. RADIOLOGY 578, 579 (2000) (explaining the concept of confidentiality as it relates to the practice of teleradiology).

³⁰⁷See ACR, *Statement on the Interpretation of Radiology Images Outside the United States*, *supra* note 137.

means meeting compliance with the Health Insurance Portability and Accountability Act of 1996 (HIPAA).³⁰⁸ The purpose of HIPAA is to protect personally identifiable health information, but exceptions do exist depending upon who is using it and the intended purpose of the use.³⁰⁹ Not only will the offshore reader within the United States need to comply with federal law, but also the provider may have to contend with state laws.³¹⁰ Privacy compliance may become more complicated where the offshore service that reads is located in a foreign country, which may require the service to be compliant with the various privacy laws of European nations.³¹¹ The potential conflict is not lost on the offshore teleradiology reading services, especially where HIPAA may not apply to reading in foreign countries.³¹² Currently, service providers have concerns related to the passage of state laws and federal initiatives specifically aimed at teleradiology offshore reading services.³¹³

V. OFFSHORE READING IS THE WAVE OF THE FUTURE, SO PROMOTE IT

Clearly, teleradiology is vulnerable to misuse and abuse. Physicians may be frightened by the future. Increased utilization of offshore teleradiology reading services by groups and hospitals likely will not cause a massive loss of jobs and may not pose the threat to the quality of practices, as many in diagnostic radiology believe.³¹⁴ The very nature of the radiology work dynamic requires interaction between the referring physician and the reading radiologist. The need for personal consultation will likely constrain the movement of radiology work overseas because the formation of a collegial relationship between the referring domestic physician and foreign reading physician may be lacking.³¹⁵ Conversely, others believe that computer-mediated communications, such as text messaging, could foster outsourcing because parties would be in nearly instantaneous contact with each other.³¹⁶ Still others point out that the basic tasks of diagnostic radiology, such as

³⁰⁸See P. Greg Gulick, *E-Health and the Future of Medicine: The Economic, Legal, Regulatory, Cultural, and Organizational Obstacles Facing Telemedicine and Cybermedicine Programs*, 12 ALB. L.J. SCI. & TECH. 351, 380-87 (2002).

³⁰⁹*Id.* at 384 (explaining the intended purpose of HIPAA).

³¹⁰See ACR, *Statement on the Interpretation of Radiology Images Outside the United States*, *supra* note 137.

³¹¹See Tyler, *supra* note 203.

³¹²See Harvey, *supra* note 95.

³¹³*Id.* (citing comments by service providers regarding legislative initiatives by Sen. Hillary Rodham Clinton and Rep. Edward J. Markey, which would require patients to give consent before their medical information could be sent by teleradiology for reading overseas; some fear passage of such legislation would essentially close down offshore reading).

³¹⁴See Pollack, *supra* note 19, at 31.

³¹⁵Forman, *Offshoring Teleradiology and the Future of Our Specialty*, *supra* note 94 (explaining that a radiology outsourcing has constraints that will naturally limit its movement offshore, such as the value placed on the availability of the radiologist for interaction with his or her colleagues).

³¹⁶Goelman, *supra* note 117 (explaining that the spatial nature of radiology work; where radiologists have always worked offsite, makes the use of computer mediated communication technologies an acceptable means to accomplish the reading tasks associated with radiology,

image interpretation and its reliance on pattern recognition skills, will not allow outsourcing on a grand scale because pattern recognition skills cannot be easily written into repetitive rules for computer processing.³¹⁷ Nevertheless, most agree that state licensure schemes still present one of the greatest barriers to the spread of this technology overseas.³¹⁸ Unfortunately, the upside of this technology is too great to let the bad actors ruin the potential for improving health care worldwide.³¹⁹

The best option to foster growth of the technology services and maintain the quality of these in the United States is to develop an integrative and cooperative approach to licensure amongst the states.³²⁰ Many commentators over the past decade have proposed various solutions to impediments to medical licensure portability, with most proposals focusing on identifying licensure schemes that promote the expansion of access to the different facets of telemedicine, including teleradiology.³²¹ More often than not, commentators cite the national licensing paradigm currently utilized by United States military medicine as a workable solution, since it allows participants to practice across state borders, as long as they hold a valid license in at least one state.³²² In 2002, an ad hoc committee formed by the Federation of State Medical Boards (FSMB) drafted a proposal for a “licensure by endorsement” scheme hoping such a scheme might improve the portability of medical licenses among the states.³²³ Although the FSMB favored the increased

that radiologists feel more autonomy by working at home, and though this process will continue to evolve, it will remain under the control of radiologists).

³¹⁷Levy & Goelman, *supra* note 90 (discussing application of rules to achieve computer substitution, where job tasks that can be represented as deductive rules or rules-based logic structure are the ones most likely to be outsourced because they arrive from the process itself while other rules-based systems, such as inductive rules, are more complicated and less easily translated into computer language, and still others which rely on pattern recognition, such as those used in diagnostic radiology, are the most difficult to apply to computer use).

³¹⁸*Id.*

³¹⁹See Pong & Hogenbirk, *supra* note 237; see also Gulick, *The Development of a Global Hospital*, *supra* note 274, at 212; see Tyler, *supra* note 203.

³²⁰Sulentich, *supra* note 152, at 37.

³²¹*Id.* at 17-37 (discussing the various categories of licensure that may improve access to telemedicine technology that include: Category I groups relates to individualized state action containing the consultation model, the full and special licensure (special license of telemedicine practice) model and the registration model (Telemedicine Development Act of 1996 enacted in California); Category II groups require cooperation between states, such as the reciprocity between states and multistate compacts; and Category III groups focus on national licensure schemes).

³²²See Gulick, *The Development of a Global Hospital*, *supra* note 274, at 204 (noting that the federal government has the power to regulate the provision of health services to veterans and the military, where military law allows a member of the armed forces holding a valid license issued by a state to practice medicine anywhere in the United States, including its territories).

³²³See FEDERATION OF STATE MEDICAL BOARDS, REPORT OF THE SPECIAL COMMITTEE ON LICENSE PORTABILITY, (2002) http://www.fsmb.org/pdf/2002_grpol_License_Portability.pdf (last visited Apr. 18, 2007) (outlining the recommendations by the Committee that recommended an expedited licensure process for physicians that met the qualifications that

portability of a medical license between states, it also reaffirmed the right of the states to regulate the practice of medicine within states in its final draft. The committee, however, also recognized that the current state-based licensure system was then, and is now, threatened by economic, political, and social forces within a modern American society.³²⁴ Moreover, the committee felt that issues of license portability related to telemedicine must be addressed.³²⁵

The committee promoted the institution of a licensure by endorsement scheme for physicians possessing an unrestricted license because it maintained the existing state-based licensure scheme and it continued the high standards set for physician licensure and practice.³²⁶ Moreover, it endorsed this scheme because it offered the greatest advantage to the state medical boards by requiring little, if any, amending of the existing state statutory laws. Not only did it maintain the status quo with respect to existing law, but also it avoided the need for states to enter contracts or other formal agreements between the several states.³²⁷ The committee then recommended that state medical boards adopt its proposed scheme, so that physicians holding an unrestricted license would quickly qualify for receipt of a medical license through an expedited review process.³²⁸ The committee further urged that the system for verification of credentials be made more standardized by utilizing one service, such

would flow from the “development of a standard medical licensure application and acceptance of established standards for primary source verification of physician core credentials, including identity, medical education, post graduate training, examination, and disciplinary history”).

³²⁴*Id.*

³²⁵*Id.*

³²⁶*Id.*

³²⁷*Id.*

³²⁸*Id.* (providing the following qualifications for eligibility under the expedited scheme, where the applicant submits for evaluation: applicant identity, all jurisdictions of current licensure and any pending disciplinary proceedings, graduation from an approved medical school through the Liaison Committee of Medical Education (LCME) or the American Osteopathic Association (AOA) approved medical school; or fifth pathway certificate; or Educational Commission for Foreign Medical Graduates (ECFMG) certificate; passing one or more of the following acceptable medical licensure examinations within three attempts: United States Medical Licensing Examination (USMLE) Steps 1-3 or its predecessor examinations (National Board of Medical Examiners (NBME) I-III or the Federation Licensing Examination (FLEX), the examinations offered by the National Board of Osteopathic Medical Examiners (COMPLEX_USA) levels 1-3 or its predecessor examination(s) or the Medical Council of Canada Qualifying Examinations (MCCQE) or its predecessor examinations offered by the Licentiate Medical Council of Canada; and the examinee completed the total sequence within seven years, except the Ph.D. combination program; at least three successive years of postgraduate training in a program accredited by the Accreditation Council on Graduate Medical Education (ACGME) or the AOA and/ or certification or recertification by a medical specialty board recognized by the American Board of Medical Specialties or the AOA with the previous ten years whereas lifetime holders not passing a medical specialty board must sit for Special Purpose Examination or the Comprehensive Osteopathic Medical Variable Purpose Examination followed by criminal records checks, current or pending or absence of disciplinary proceedings and verification of specialty board certification as well as professional experience).

as the Federation Credentials Verification Service, to check the credentials of all physicians.³²⁹ Even though the FSMB encouraged states to initiate this abbreviated process and issue medical licenses to those who qualify, it did not go so far as to guarantee that a qualifying physician who met all of these requirements would get a license.³³⁰ Although this scheme has great potential to make licenses more portable between states that choose to adopt it, it leaves open the possibility that one or more states might decide not to issue a license, even if the physician met all the necessary qualifications.³³¹

If that is the case, then it is debatable whether such a licensing scheme actually increases the portability of medical licenses between any states. More importantly, the committee did not formally address licensure issues related to the practice of telemedicine or teleradiology across state lines. Thus, it remains an open question whether state boards may grant licenses by endorsement or continue to resist the practice of telemedicine or teleradiology.

Perhaps, the experiences in the field of nursing with the Nurse Licensure Compact suggest that adoption of the FSMB proposal could, after all, increase the portability of medical licenses, at least for physicians planning to practice across state lines in a brick-and-mortar location.³³² The National Council of State Boards of Nursing created a mutual recognition of licensure scheme in the form of the Nurse Licensure Compact (NLC), which was passed into law by four states on January 1, 2000.³³³ States wishing to participate in the NLC must adopt it, and as of March 31, 2006, twenty states have enacted it.³³⁴ Not only is the NLC being enacted by states, but it has also shown an ability to undergo modification to improve the quality of care. For example, on July 1, 2005, the NLC barred applicants for initial licensure from obtaining multistate privileges unless these new candidates passed the NCLEX examination.³³⁵ The NLC also may improve patient safety and quality of care

³²⁹*Id.* (identifying the Federation Credentials Verification Service as one service that could provide verification of the core credentials of a physician in a timely fashion, which would include evaluation of the examination and disciplinary history of the candidate).

³³⁰*Id.* (defining the minimum requirements that a candidate with an unrestricted license must meet for endorsement as: submission of a completed application, initiation of transmission of a FCVS physician profile to the board, and expeditious meeting of all other state board specific requirements, such as an interview, orientation, and remittance of required fees, which upon completion give the candidate every consideration for an expedited issuance of a full and unrestricted license).

³³¹*Id.*

³³²NATIONAL COUNCIL OF STATE BOARDS OF NURSING, *Nurse Licensure Compact* (November 6, 1998), available at <http://www.ncsbn.org/1100.htm>.

³³³NATIONAL COUNCIL OF STATE BOARDS OF NURSING, *Nurse Licensure Compact (NLC) Implementation*, <http://www.ncsbn.org/158.htm> (last visited Apr. 18, 2007) (supplying a list of twenty states that have officially enacted the Nurse Licensure Compact and indicating an additional two states, Kentucky and New Jersey, in which the enactment is pending implementation, as it has been signed by the governors of these states).

³³⁴*Id.*

³³⁵NATIONAL COUNCIL OF STATE BOARDS OF NURSING, *Nurse Licensure Compact*, *supra* note 332.

delivered by allowing the professional boards of participating states to share information on disciplinary matters pertaining to participating nurses.³³⁶

Apparently, states are enacting the NLC to satisfy their nursing needs, which suggests they do not manifest the same levels of reluctance toward nurses practicing across their borders that they do for physicians. Perhaps one explanation for this apparent difference in attitude toward licensure for the different groups lies in the economic motives of the states that choose to enact the NLC. These states may be motivated by their own self interest, which is one related to supply and demand, where the NLC allows them to recruit nurses in a time of shortage.³³⁷ If this is the case, then it seems that states should be willing to adopt a more liberal policy toward radiologists practicing teleradiology across state lines since there is a shortage of radiologists.³³⁸

If a shortage of diagnostic radiologists truly exists within the majority of states, then it seems reasonable that states should consider mirroring their experience with the NLC and adopt licensure by endorsement to alleviate any shortage of diagnostic radiologists within a given state.³³⁹ One alternative solution applicable to diagnostic radiology and its teleradiology services could be reliance on the American Board of Radiology (ABR) specialty certification requirements. Currently, American and Canadian-trained physicians must attend accredited medical schools that have similar curricula, where all graduates must pass standardized examinations administered by the National Board of Medical Examiners or other governing bodies before entering the specialty of diagnostic radiology.³⁴⁰ After completion of training in diagnostic radiology, a candidate may undergo the process of primary certification by the ABR, which sets its own requirements for candidates wishing to obtain primary certification within the specialty of diagnostic radiology.³⁴¹ The ABR offers primary certification or board certification to both domestic and foreign radiologists who meet all of its certification requirements.³⁴²

To qualify for primary certification in the specialty of diagnostic radiology, a candidate must have a minimum of one year of postgraduate clinical training in a primary care area followed by an additional four years of training in an approved diagnostic radiology program.³⁴³ In order to qualify for graduation from an

³³⁶*Id.*

³³⁷Ronald L. Scott, *Cybermedicine and Virtual Pharmacies*, 103 W.VA. L. REV. 407, 464 (2001) (suggesting an economic motive behind some states adopting the Compact allowing nurses to practice across state lines as compared to their reluctance to do the same for physicians, a possibility suggested by Dr. Micheal Ewer, a former student at the University of Houston Law Center).

³³⁸*See* Covey et al., *supra* note 100.

³³⁹*See* Jarvis & Stansberry, *supra* note 50, at 841.

³⁴⁰*See* Gulick, *The Development of a Global Hospital*, *supra* note 274, at 206.

³⁴¹American Board of Radiology, *Diagnostic Radiology Requirements* (2005), http://www.theabr.org/DR_Pri_Req.htm (last visited Apr. 18, 2007) (listing the requirements for American and Canadian graduates wishing to achieve primary certification in the specialty of Diagnostic Radiology).

³⁴²*Id.*

³⁴³*Id.*

accredited radiology program, a candidate must also meet all of the training requirements as promulgated by the ABR.³⁴⁴ Once a candidate meets all of the training requirements, she must pass all portions of a written and oral national examination.³⁴⁵ Although the ABR primarily certifies American and Canadian graduates, it also offers certification to international medical graduates from foreign training programs; international graduates also must satisfy all certification requirements of the ABR.³⁴⁶ The requirements for international graduates parallel those of their American and Canadian counterparts.³⁴⁷ Not only must the international medical graduates meet all of the training requirements, but they must also pass all portions of the written and oral exams conducted by the ABR.³⁴⁸ In effect, the ABR has created a de facto international standard by which it can evaluate the clinical competence of all physicians it certifies as qualified to practice diagnostic radiology.

Although the ABR focuses on primary certification of candidates within diagnostic radiology, the ABR also provides certification programs in subspecialty areas within the field of radiology, such as neuroradiology, pediatric radiology, nuclear medicine, and interventional radiology.³⁴⁹ To be awarded a subspecialty certificate, a candidate must have completed an additional year of advanced fellowship training within one of these specialty areas along with several other requirements. For instance, the program director of the training program in the subspecialty discipline must certify that the candidate completed the mandatory year, and the candidate must document his work experience in that field.³⁵⁰ Next, the candidate must pass an examination to demonstrate his proficiency within a given area.³⁵¹ Ultimately, the process serves as one more level of quality control on those practicing diagnostic radiology.

American, Canadian, and foreign-trained candidates must go through a rigorous training and certification process before receiving a primary certification or

³⁴⁴*Id.* (listing the additional requirements for primary certification as completion of mandatory five years of training, cardiac life support certification, high moral and ethical standards, and proof of valid state licensure (training license is acceptable)).

³⁴⁵*Id.*

³⁴⁶American Board of Radiology, Diagnostic Radiology International Medical Graduates (2005), http://www.theabr.org/DR_IMG.htm (last visited Feb. 2, 2007) (detailing numerous requirements for a foreign graduate wishing certification by the organization).

³⁴⁷*Id.* (listing the following requirements for international medical graduates: satisfaction of the country's training requirements, receipt of appropriate certification in the country of training, completion of a clinical year of training, completion of a full residency and Faculty/Fellowship Verification Forms completed by the department chair and program director on a yearly basis).

³⁴⁸*See id.*

³⁴⁹American Board of Radiology, Diagnostic Radiology Requirements, *supra* note 341 (listing the requirements for subspecialty areas within Diagnostic Radiology which offer special certification).

³⁵⁰*Id.*

³⁵¹*Id.*

subspecialty certification from the ABR. More importantly, the ABR certification requirements include most, if not all, of the requirements promulgated by the Special Committee on License Portability sponsored by the FSBM.³⁵² Both the training and licensure requirements for ABR certification create a de facto national training standard, which is validated by nationally administered written and oral examinations.³⁵³ If one also considers that United States jurisdictions are replacing the locality standard of care with the higher, more universal, national standard of care, that implies that physicians within the states are being held to a more uniform national standard of care.³⁵⁴ In fact, some commentators believe that a “virtual national standard of care” would further promote the state of health care within the United States.³⁵⁵ Thus, it seems reasonable that states should consider adopting the ABR primary certification as a proxy license for the practice of teleradiology within the given state as long as the bearer of an ABR certificate also has an unrestricted license to practice medicine in one of the sister states.

Currently, some postgraduate training program directors are recommending that diagnostic radiology create a new specialty in electronic imaging and technology, which could provide additional training to physicians in electronic communications and Picture Archiving and Communication Systems (PACS).³⁵⁶ Such specialization in technologies related to teleradiology and advanced imaging would foster the creation of a distinct subspecialty in teleradiology, where certification might serve as a basis for a national-international license to practice teleradiology. Licensure and the practice of teleradiology could be made contingent upon completion of specialty training directed toward electronic communication as further assurance to the states that the physician is competent. A similar process could be applied to hospitals and groups performing teleradiology services. Currently, certification and quality assurance programs are conducted in technology-based specialty divisions.³⁵⁷ For example, the American Institute of Ultrasound in Medicine (AIUM), one of the principal governing bodies responsible for maintaining quality practice in diagnostic medical ultrasound, which is also a specialty area in diagnostic radiology as well as other medical specialties, provides a rigorous ultrasound practice certification program. The AIUM awards certification to members who achieve successful

³⁵²See FEDERATION OF STATE MEDICAL BOARDS, *supra* note 323.

³⁵³*Id.*

³⁵⁴*Sheeley v. Memorial Hosp.*, 710 A.2d 161, 165 (R.I. 1998).

³⁵⁵See Kelly K. Gelein, Note, *Are Online Consultations a Prescription for Trouble? The uncharted Waters of Cybermedicine*, 66 BROOK. L. REV. 209, 250-52 (2000) (discussing the need for a “virtual national standard of care” to promote cybermedicine).

³⁵⁶See Bartholmai et al., *supra* note 60, at 184-85.

³⁵⁷AMERICAN INSTITUTE OF ULTRASOUND IN MEDICINE, STANDARDS AND GUIDELINES FOR THE ACCREDITATION OF ULTRASOUND PRACTICES (Nov. 13, 2005), <http://www.aium.org/accreditation/standards.asp> (setting forth the voluntary accreditation standards and guidelines for accrediting medical staff and personnel who perform and interpret diagnostic medical ultrasound imaging studies, which apply to personnel performance, scientific interpretation, quality assurance of equipment, staff performance, record keeping, and space management for practice performing these clinical studies).

completion of their certification review process.³⁵⁸ Not only is the certification process rigorous, but it also provides assurance that the services provided meet the standard of practice within the discipline.³⁵⁹ Successful completion of a similar process for practices that provide teleradiology services throughout the several states could provide one more layer of assurance to the states and the public that services provided from a teleradiology practice in a sister state should be no different from those delivered by a similar certified practice in the home state.

If teleradiology services were treated as a technology-based specialty area within diagnostic radiology, then these intensive certification processes could reassure states that teleradiology services are worthy of acceptance, regardless of their location. Since all teleradiology programs would be held to the same licensure and certification standards, any teleradiology service beaming into or out of a particular state would have the same quality as any other service within the given state. Thus, states may be less likely to object to out-of-state service providers based on their belief that these out-of-state providers pose a risk to the health and safety of the state citizens receiving services.

Such an intensive certification process should also allow states to forego the need for the additional scrutiny of their licensure process for the individual physician performing radiology services, because physicians who lack teleradiology certification would not be qualified to practice, regardless of their location. By adopting this scheme, states could still regulate physicians, as the teleradiology license would serve as a *de facto* license to practice within the state. Issues of applicable law could be resolved through agreements in the form of choice of law selection clauses, where the practicing radiologist would agree to be subject to the law of the state where the patient resides. Thus, the state board in the state receiving transmissions would have jurisdiction over the reading physician, regardless of the location of the reading radiologist. In effect, any additional licensure review by a state board would seem redundant, and needlessly extracting state resources away from more important functions of the board, such as investigating and monitoring bad physicians.

Some commentators continue to promote the adoption of a national medical licensing scheme for telemedicine practice. A purely federal scheme would preempt state licensing laws and thus, effectively remove the states from the regulation equation.³⁶⁰ Again, most paradigms advanced by these commentators use the military medical license as a model.³⁶¹ The problem with the military medical practice model is the location of the practice is considered to be on federal soil, not state lands.³⁶² Unlike a purely national license scheme, the military physician must still have a valid state license issued from a state licensing authority, which means a military provider must successfully complete the licensure process for at least one state.³⁶³ Any national license model that is adopted will likely require the creation of

³⁵⁸*Id.*

³⁵⁹*Id.*

³⁶⁰*See* Sulentic, *supra* note 152, at 37.

³⁶¹*See* Gulick, *The Development of a Global Hospital*, *supra* note 274, at 204.

³⁶²*Id.*

³⁶³*Id.*

a brand new agency responsible for certifying physician credentials and tracking licenses. Alternatively, these duties could be incorporated into an existing federal entity to utilize its preexisting experience with national licensing schemes and enforcement.³⁶⁴ If Congress were to create or delegate these responsibilities to an existing agency, such as the FDA, then it might impose new burdens on an agency already ill-equipped to manage its primary task, which is drug safety.³⁶⁵

The principal advantage of any national license scheme is its uniformity, which promotes free movement of physicians between the several states.³⁶⁶ Prosecution of any violation related to licensure or the interstate practice of medicine may be problematic, especially if the licensing scheme mirrors the military license paradigm where the physician is held accountable in the state that originally issued the license.³⁶⁷ Unfortunately, a federal licensing scheme will require a responsible federal agency to bring an enforcement action in an area that is traditionally left to state regulation.³⁶⁸ Because the states traditionally regulate the practice of medicine within their borders under the Tenth Amendment, some states may resist the loss of power.³⁶⁹

States may challenge this federal intrusion into an area that they traditionally regulate by invoking health and safety concerns related to out-of-state providers under the Tenth Amendment.³⁷⁰ Of course, the federal government has rebutted this challenge by invoking the Commerce Clause as a basis to regulate the interstate commerce.³⁷¹ In the past, neither Congress nor the Supreme Court has shown much interest in utilizing the Commerce Clause to regulate the intrastate practice of medicine.³⁷² Perhaps a Supreme Court decision in 2000 supporting the right of Congress to control how states use personal information associated with a driver's license might support the role of the Commerce Clause in regulating medical

³⁶⁴*Id.*

³⁶⁵See Amanda Spake, *A Sick Agency in Need of a Cure?*, U.S. NEWS & WORLD REPORT, Dec. 13, 2004, at 32 available at <http://www.usnews.com/usnews/health/articles/041213/13fda.htm> (reviewing the recent problems at the FDA related to agency oversight in new drug approval process related to drugs, such as Vioxx, where the agency was considered unable to protect Americans from unsafe drugs and the FDA did not have leverage to go against major drug manufacturers).

³⁶⁶See Sulentic, *supra* note 152, at 35-36.

³⁶⁷*Id.* at 36.

³⁶⁸*Id.*

³⁶⁹Vyborny, *supra* note 48, at 95-98 (citing state and federal issues related to the Tenth Amendment where states have a nearly century of precedence backing their right to govern the practice of medicine within their borders).

³⁷⁰*Id.* at 96-98.

³⁷¹*Id.*

³⁷²Lars Noah, *Ambivalent commitments to Federalism in Controlling the Practice of Medicine*, 53 KAN. L. REV. 149, 16-70 (2004) (discussing the past history of the lack of interference by the Supreme Court in the issue of regulating the practice of medicine since it did not generally involve interstate commerce and did not invoke the powers of Congress under the Commerce Clause).

licenses.³⁷³ The Court held in that case that information derived from a driver's license was an article of commerce, and the Commerce Clause gave Congress the power to regulate how states treat the driver information of its citizens.³⁷⁴ If a medical license could be treated as a commodity, like the information associated with a driver's license that has value, it could allow Congress to regulate a medical license as part of commerce. Some commentators also emphasize that the purpose of the Commerce Clause is to prevent states from erecting economic barriers.³⁷⁵ Clearly, state licensure regulations and laws act as a barrier to physicians who wish to participate in teleradiology services across state lines practices, but cannot because the state refuses to issue a license. This activity may be considered protectionist, especially if it favors local physicians over out-of-state physicians, where the qualifications of the physicians involved are the same.³⁷⁶

Obviously, teleradiology and any images beamed between states should qualify as interstate activity, since both telephone and power transmission lines are involved in the process of transferring digital information from one state to another.³⁷⁷ Teleradiology digital transmissions might be analogized to electrical transmissions through electrical lines that move electricity between the several states.³⁷⁸ The Supreme Court recognized the power of Congress to regulate this activity under the Commerce Clause.³⁷⁹ Moreover, the transactions surrounding teleradiology transmissions generate money for the participating parties because some services are compensated.³⁸⁰ This is precisely the situation where the Supreme Court might support a federal initiative for a federal medical license, if Congress passed such an Act.³⁸¹

³⁷³Reno v. Condon, 528 U.S. 141, 148-49 (2000) (affirming the right of Congress under the Commerce Clause to regulate how information associated with a driver's license was utilized by the South Carolina State Department of Motor Vehicles because the information was commerce).

³⁷⁴See *id.*

³⁷⁵Scott, *supra* note 337, at 465.

³⁷⁶Vyborny, *supra* note 48, at 107-08.

³⁷⁷Pliskin, *supra* note 64.

³⁷⁸Federal Power Comm'n v. Union Electric Co., 381 U.S. 90, 94 (1965) (standing for the proposition that the transmission of electricity across state lines falls under the jurisdiction of the Commerce Clause); see also Ira D. Wiener, Note, *Mouse-To-Mouse Resuscitation: Cybermedicine and the Need for Federal Regulation*, 23 CARDOZO L. REV. 1107, 1136-37 (2002) (noting that the Internet may be analogized to a super highway, telephone lines, or electrical transmissions where these events could act as an instrumentalities for interstate commerce).

³⁷⁹See Wiener, *supra* note 378.

³⁸⁰Forman, *Offshoring Teleradiology and the Future of Our Specialty*, *supra* note 94 (discussing the reimbursement issues related to teleradiology, the offshoring of teleradiology, and imaging costs).

³⁸¹See *Gonzales v. Raich*, No. 03-1454, 2005 U.S. LEXIS 4656, at **29 (U.S. June 6, 2005) (explaining that Congress may regulate the channels of commerce as well as regulate and protect the instrumentalities of commerce, and it may regulate intrastate commerce that substantially affects interstate commerce).

Much of this controversy could be avoided if the states would adopt one of the more reasonable and flexible licensure schemes. If states accepted the ABR primary certification certificate as a proxy for licensure within the state receiving teleradiology transmissions, then image data could flow freely to physicians available to read twenty-four hours a day. More importantly, states could reduce their costs associated with the individual licensure process. States could be fairly confident that they will be getting a high quality product without giving up control over it. Parties could agree to make the federal court proper jurisdiction and venue through the use of forum selection and choice of law clauses, if states were concerned that they could not obtain jurisdiction over foreign readers. If states adopted a "check the box" electronic license request procedure, states could receive electronic notification from the provider that the provider was certified and wished to practice within the state. Any violation of the medical practice act of the state could subject the physician to disciplinary action in every state in which the physician is designated as active for practice. Because states now have electronic profiles on their physicians, they could easily be notified by their sister states when a physician was subject to discipline for the practice of teleradiology. The only difference between this scheme and the current individual licensure system of most states is the removal of a redundant license verification procedure and likely a reduction in cost and manpower at a given state board.

VI. CONCLUSION

Love it or hate it, teleradiology is here to stay. The existing manpower shortage in diagnostic radiology and the costs related to medical imaging are driving this technology forward, as parties seek comparative advantages. Although the threat to domestic diagnostic radiology jobs in the near future may be more hype than substance, potential problems loom on the horizon as this technology goes global. Prudent practice dictates that societies seek out the advantages of this technology, but also set reasonable regulatory limits to buffer its negative impact. Although many proposals have been made, the majority of states still cling to full and unrestricted licensure for providers of teleradiology services. By adopting the American Board of Radiology's primary certification scheme as a form of national licensure, society may achieve a standardized practice, which would ensure the quality of service and practice of teleradiology.

Moreover, adoption of such a scheme could promote cooperative efforts between all nations, which could eventually lead to global licensing as a way of improving the standard of care. In effect, countries could exchange their night-shifts for day-shifts, where no tired physician would be responsible for reading emergency studies in the middle of the night.

Think about the possibilities. An Australian physician arrives for work one morning to read the work of an American colleague that has gone to bed. When daylight comes in the United States, the American physician arrives at work to read the night-shift work of the Australian colleague who has left work for the day. Essentially, no film would be read by a sleep-deprived physician. Could this change in lifestyle lead to fewer errors due to reader fatigue? Could it lead to improved manpower availability or costs reductions? The answer is probably yes, but states must answer a critical question. Will states seize these advantages or continue to erect useless barriers that may actually hurt the quality of health care its citizens

receive? It is time to adopt sensible regulations, and ride the Internet wave into the future.