Children's Sexual Assault Telemedicine Program Assessment

Report prepared by the

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I. Executive Summary

The purpose of this review is to assess pilot users' current experiences with the Children's Justice Act telemedicine project and to identify factors that may affect the project's expansion to numerous additional rural sites. The premise of the proposed expansion is that medical personnel in the "centers of excellence" would provide support to rural sites by consulting with them based on images transmitted from medical examinations. This raises issues not only of the suitability of the hardware and software for transmitting and subsequent evaluation of these images, but also of the logistical and institutional arrangements that would be necessary for a broader telemedical network to function smoothly. An evaluation of the software used in the pilot phase, *Second Opinion* , was a focus of this research. Our primary observations are the following:

- *Second Opinion* software was easy to use and satisfactory for the purposes of peer review and remote consultation;
- *Second Opinion* is an excellent training tool;
- There are important differences across medical sites using colposcopes and *Second Opinion* software that influence how the software is used, in addition to how well an expanded system of support for remote consultations would operate;
- Experiences in other states illustrate ways in which medical peer review, programs that train sexual assault examiners, and routine remote consultations can be integrated into comprehensive services.
- Some major problems facing expanding the CJA project include obtaining remuneration for services provided by medical personnel, and handling legal issues surrounding liability matters for physicians providing services based on transmitted images.

We offer some detailed recommendations on expansion issues in the final chapter of this report. They include:

- Establishing a regularized program of training for sexual assault identification would be worthwhile, and the Children's Justice Act has an opportunity to fill a need in Texas by taking a lead role in establishing such a statewide training and service program. One critical feature of this role should be the creation of an ongoing means of communication among the practitioners and service providers undertaking sexual assault examinations. This may entail the creation of an "electronic listserve" for these individuals, convening quarterly peer review meetings (perhaps facilitated using videoconferencing technology), and holding annual in-service workshops that can support maintaining skills and sharing information.
- Investigate strategies used in other states for financial support, including state budget items available for these sorts of programs; liaison with other states may illuminate useful models for financial support as well as opportunities to join with them in negotiating with software and hardware vendors.
- Create a working relationship with *Second Opinion* vendor in order to obtain a product that works for data collection, archiving and retrieving purposes; bulk discounts from the vendor may be possible if CJA worked with users of *Second Opinion*, both within Texas and outside of Texas as well.
- At the state level, take a leadership role in establishing continuing education and licensure or credentialing programs for sexual assault examiners, with continuing medical education units or other appropriate credentialing as part of the program; this will provide linkages with existing telehealth programs. Formalize and institutionalize ongoing training through existing continuing education networks such as the Area Health Education Centers. Such networks can handle the telecommunications aspects of a statewide program for training.

II. Introduction

A. Children's Justice Act Project Goals

The Children's Justice Act has provided funds to support a remote diagnosis project that involves linking physicians in rural areas of Texas to selected medical professionals who have specialized expertise in interpreting the signs of sexual abuse in children. The pilot phase of this program was underway from 1996 through 1998. As part of the pilot project, cooperating medical personnel from five initial sites around Texas organized an informal peer review network in which they shared images from medical examinations of patients and consulted with each other on their evaluations of those images. The peer review process is common in the medical field, and it serves to maintain professional standards as well as build a contact network of physicians to whom others can turn for questions and advice in sexual abuse cases. The core elements common to all sites that participated in the pilot phase were the examining instrument -- the colposcope -- and the software used to transmit images, *Second Opinion* software. Each site used its equipment in slightly different ways.

This pilot phase served to give the participating institutions expertise with the equipment and software used to transmit the images, and to reveal some of the opportunities and difficulties of working with this system inside their respective institutional settings. Insofar as the long term goal of the project is to connect various centers of excellence with rural sites for purposes of peer review as well as for consultation, experience with the software even on a limited basis was absolutely necessary. It revealed some of the deficiencies of the software and also underscored some of the unique constraints each site might bear in a possible expansion effort.

The purpose of this review is to assess current experiences with the pilot phase of this telemedicine project and to identify factors that may affect its expansion to rural sites. The premise of the proposed expansion is that medical personnel in several "centers of excellence" would provide support to rural sites by consulting with them based on transmitted images from their medical examinations. This raises issues not only of the suitability of the hardware and

software for transmitting and subsequent evaluation of the images, but also of the logistical and institutional arrangements that would be necessary for a broader network to function smoothly.

B. Research Questions and Methodology

The core research questions we address in this report include the following:

1. Is *Second Opinion* the best software product to use to support CJA's project expansion in terms of cost, image quality, and ease of use?

We contacted the Texas-based *Second Opinion* participants in the pilot project to obtain some independent feedback about the software and its advantages and disadvantages. We also queried other members of the U.S. telemedicine community using or considering using *Second Opinion* in order to obtain their assessments. While an independent objective trial regarding the utility of this software was outside the scope of our research, we do report on Alaska's trial evaluation of alternative software for telemedicine. Other states also have undertaken various assessments of transmission capabilities for medical purposes and we highlight their findings as well.

2. What are the telecommunications issues CJA might want to consider as it expands to 300 or more sites around the state?

Answering this question involved an examination of several related telemedicine projects in Texas -- including institutions with established telemedical and network operations.

3. What are the institutional and administrative opportunities and risks associated with expanding the CJA telemedicine project from its current five centers of excellence?

We assessed both the opportunities and risks entailed in CJA's expansion plans, with a view to considering alternative institutional arrangements and technical considerations (networks, software). We offer some evaluation considerations CJA may wish to implement as it expands to new sites.

C. Outline of Report

This report contains several major sections. Section III reviews the telecommunications-related dimensions of the project and it offers a review of relevant telemedical networks and their operations in Texas. Section IV provides an overview and evaluation of *Second Opinion* software and notes briefly the equipment needed to use the software, the product's features, and CJA project participants' assessments of the software. The section concludes with assessments from users of the software in other states or programs. Section V examines how organizational settings dictate ways in which the software is used; it also describes several important training and operational considerations related to software use. Section VI examines issues pertinent to CJA's plan to add more sites and more utility to its telemedical network and offers recommendations.

Several Appendices have also been included in the report. Appendix A provides a comparison of evaluations of the software by each participating site. Appendix B contains the interview protocol used by researchers at the Telecommunications and Information Policy Institute (TIPI), and Appendix C provides a list of those individuals whom were interviewed as part of this project. Finally, Appendix D contains a series of maps relevant to descriptions in various parts of this report.

III. Telemedical Networks

A. Overview

A broad array of telemedicine applications is available to health care. Traditional telemedicine applications range from consultations by telephone or email to interactive real-time videoconference consultations or examinations. Recent advances in telecommunications and computer technology, cost declines, as well as a mandate to extend Medicare/Medicaid processing across electronic data networks all have enhanced the promise of telemedicine and the use of transmission networks for various medical and medical record-keeping purposes. New remote medical instrumentation capabilities and software allow for sophisticated consulting and diagnoses for a variety of medical specialties.

However, there has been little coordination among telemedicine efforts across the country. A Government Accounting Office report found that between 1994 and 1996 alone, the federal government had invested nearly $650 million in telemedicine without coordination or a goal.

Most of the literature on telemedicine to date has dealt with its role in distance education for medical training, rather than its specific use for medical applications (Crump & Pfeil, 1995). In addition, much of the research on applications of telemedicine is limited to results of pilot projects, and there is little research that examines the challenges in setting up new telemedicine services (Taylor, 1998). In general, however, a variety of benefits offered by telemedicine have been recognized:

- Improved access to healthcare in unserved or underserved areas.
- Reduced cost for patients or healthcare providers, by reducing or eliminating travel and decreasing duplication of services, technologies, or specialists.
- Reduced professional isolation of medical providers by providing peer and specialist contact (Hartman and Moore, 1992).
- Improved quality of care with access to specialists and collaborating medical professionals (Williams & Moore, 1994).

The federal Office of Rural Health Policy undertook the first survey of rural telemedicine in 1996 and released its conclusions in 1997. Among the important findings were that about 30% of the 159 rural hospitals surveyed expected to use some telemedicine technology to deliver patient care, most often (68% of the time) involving teleradiology. Most of the teleconsult programs they found were very young, in fact, less than a year old. Radiology and cardiology were the most common clinical applications reported. Over half the hospitals also had used their systems for continuing education or other non-clinical applications. Contrary to other reports, this survey found that 90% of the hospitals that had telemedical facilities used real time transmission of data and images; two thirds also had store-and-forward technologies. This is a contrast to the conclusion of another overview of telemedicine, which concluded that

telemedicine works best in two groups: prisoners, and physicians consulting one another (Sorelle, 1998).[1]

Recently, telemedicine has become a useful tool for consulting and diagnosing child sexual abuse. It has been estimated that over 2 million reports of child abuse and neglect are made in the U.S. each year (Sagatun & Edwards, 1995). Some of the research literature on this subject notes the importance of documenting sexual abuse evaluations (Frasier, LD, 1997; Parra et al., 1997). Because the medical expertise to recognize abuse and consult on these cases is a unique specialization, telemedicine applications have been developed to allow specialists to apply their expertise via telecommunications. In addition to the Texas Children's Justice Act Project, a number of state-run telemedicine projects have utilized their networks for teleconsulations on cases involving child sexual abuse. Some of these programs were profiled in this report as part of a discussion of *Second Opinion* software.

1. Benefits of Telemedical Technology

In child abuse cases, medical findings have implications for the medical community, the judicial system, the victim, and the family (McCann, 1990). The literature on telemedicine use in child abuse evaluation comments on the following benefits. All of these benefits have been reported alongside positive outcomes of using *Second Opinion* software.

- *Sharing Expertise*

Medical expertise in the evaluation of children with alleged sexual abuse is a relatively new specialty (Adams, 1992). While an overall assessment including history and behavior of the victim is essential, the medical findings of a expert physician are crucial to any evaluation of child abuse patients. Telemedicine allows for child abuse medical specialists to remotely diagnose their patients.

[1] UT Medical Branch at Galveston provides medical care to prisoners in the eastern half of the state while Texas Tech University Health Science Center in Lubbock provides it in the western portion. They treat around 130,000 patients.

- *Facilitating Timely Evidence*

Evaluation of suspected child abuse victims via telemedicine allows timely remote diagnosis and documentation and/or expert confirmation of sexual abuse. Some of the physical attributes of child abuse are present for only a brief period. Timely gathering of necessary physical evidence is crucial for later judicial proceedings (Kaufhold, 1993).

- *Educating Local Practitioners*

Repeated telemedical evaluations educate remote providers so they become more knowledgeable about the specifics of child abuse diagnosis (Siwicki, 1997).

- *Building a Case File*

Immediate diagnosis with the ability to store data (both images and descriptive text) provides a record for later referral for continuing medical care or as evidence in a judicial proceeding.

- *Easing the Difficulties of Examination for Victims*

Rather than forcing traumatized abuse victims to travel to unfamiliar locations and be treated by unknown medical practitioners, telemedicine allows physicians to collaborate with child abuse specialists and treat patients locally in familiar surroundings (Siwicki, 1997).

- *Extending Urban Expertise to Rural Settings*

Since physicians with the expertise to diagnose child abuse cases tend to reside in cities with large medical centers, many rural medical facilities lack the expertise to evaluate child abuse patients. This is particularly a problem for Texas where only 12 percent of the primary care physicians practice in rural areas, which geographically makes up 80 percent of Texas.

2. Criteria for Selecting Technology for Child Abuse Evaluation

Based on the technology benefits highlighted above, the process of selecting the specific technology-both software and hardware-for telemedicine use in evaluating child sexual abuse must consider several key issues.

- *Confidentiality*

Using public networks for sending medical information is problematic because of the need for confidentiality. Child abuse cases present an even greater degree of concern in this regard. Secure networks employing encryption to prevent unauthorized access are important for telemedicine applications (Makris, Argiriou, & Strintzis, 1997).

- *Bandwidth*

The bandwidth of the network and its ability to technically reach all potential sites affordably and to transmit high-quality images are important considerations in developing a telemedicine project for child abuse teleconsulting. For example, if the public switched telephone system is the network utilized, the technology (software and hardware) must have the ability to transmit via low bandwidth. The public switched network is the typically available, relatively inexpensive option. High capacity lines can be leased from either local or long distance carriers, but this is only necessary when there are frequent, high bandwidth applications among sites.

- *Image Quality*

The technology's ability to transmit and/or record colposcopy imagery is a crucial consideration for adoption (Slaughter & Brown, 1992). In addition, the resolution quality of the images may be important in helping physicians and courts to decide whether sexual abuse has indeed taken place (Ricci, 1991). The image-capturing ability of the workstation and the compression capability of the software for transmitting images are crucial factors.

- *Ease of Use, Compatibility*

A primary criterion in evaluating the purchase of new telemedicine software is its compatibility with existing management and medical software. For example, does the telemedicine software interface with the existing hospital information system? If large institutions have their own Hospital Information System (the case in Dallas and Ft. Worth, for example), how will the software interact with it?

- *Costs*

Planners should consider how much of an organization's existing equipment and software could be used in conjunction with any proprietary telemedicine software. The longevity and specifics of the software license are also important factors. For example, do costs include training, periodic software upgrades, or on-going maintenance?

3. Recent Applications at the State Level

As already mentioned, several states have been operating different telemedicine configurations for several years. While this is not an exhaustive list, it does indicate the range of places and services that have been incorporated into various configurations using telecommunications networks. More detail on each is provided elsewhere in this report.

Possibly the best known uses in Texas include an extensive network of services for the state prison system. Because transportation is very costly for prisoners, telemedicine makes a great deal of financial sense. In the wake of a court case that demonstrated inadequate health care in the prisons, the state system was put under the jurisdiction of a federal court. The telemedicine operation that was devised has UT Medical Branch at Galveston providing care to prisoners in the eastern portion of the state while Texas Tech University Health Science Center in Lubbock covers the western portion of the state. Together, they are responsible for 130,000 patients.

Alaska

The Alaska Telemedicine Project, founded in 1994, is a consortium of Alaska health care providers, telecommunications carriers, the University of Alaska Anchorage, and the State of Alaska. The project permits personnel in rural clinics to consult with doctors at urban health centers via desktop video teleconferencing. South Peninsula Hospital, in Homer, Alaska, has used telemedicine networks for remote child abuse evaluation from far-away specialists (Telemedicine Dateline, 1997).

California

The Center for the Vulnerable Child at the University of Southern California uses audio conferencing and high-resolution imaging to connect diagnostic centers with hubs staffed by physicians specializing in child abuse diagnoses (Rosen, 1998).

Utah

Utah's Primary Children's Medical Center in Salt Lake City is using telemedicine to enhance access to specialists and improve health care for remotely located child abuse victims (Siwicki, 1997). Using standard phone lines, images are transmitted from remote locations to a specialist at the urban hospital.

Missouri

The Missouri Telemedicine Network connects 12 hospitals, 4 primary care clinics, two medical schools, and one Area Health Education Center through an interactive television system. The University of Missouri Health Science Center serves as the hub of that network.

Oregon

The Oregon State Office for Services to Children and Families (SCF) has been awarded a $108,000 grant to help rural health care providers consult with medical experts on suspected child abuse cases.

4. Policy Issues

Many policy issues must be faced as telemedicine expands its reach in the U.S. Chief among them are how telemedicine services fit into insurance reimbursement procedures and policies; how remote consultation specifically fits into the panoply of services that may be eligible for reimbursement, particularly if it is not "real-time;" and finally, how services that overlap state jurisdictions are handled legally. The Telemedicine Report to the Congress released by the US Department of Commerce in 1997 surveys many of the policy issues facing telemedicine.

1996 Telecommunications Act

The 1996 Telecommunications Act requires that the FCC and states revise the Universal Service system based on seven principles, one of which is that schools, libraries and rural health care providers should have access to advanced telecommunications services. Rural areas were singled out with provisions that require the FCC to assure that health care providers there have access to telecommunications services "necessary for the delivery of health care" at rates that are comparable to those paid in urban areas for similar services. The Universal Service funds provide for discounted telecommunications connections for qualifying facilities. Currently, a Rural Task Force is elaborating some of the issues and policies that pertain to the goal of providing rural areas with equitable services and with ensuring the success of the discounted lines made available for schools, libraries and rural health facilities. (Mr. Rowland Curry of the Texas PUC is a member of that Task Force.)

Remuneration for Telemedicine

Most current telemedicine projects are funded through government or foundation grants. It is expected that more private firms will fund telemedicine as it gains wider acceptance among medical practitioners. Currently, details for telemedicine reimbursement remain unsettled. The Health Care Financing Administration (HFCA) is responsible for determining reimbursement guidelines for telemedicine under Medicare, Medicaid, and Child Health Insurance Programs. Both HFCA's telemedicine policies and reimbursement policies for private insurers are inconsistent. As telemedicine becomes more widely utilized, these policy issues will have to be addressed.

Beginning in 1999, Medicare and Medicaid reimbursement for various telemedicine services will be implemented. Certain third-party insurers also are beginning to reimburse telemedicine.

Consulting and Licensing

Rural areas, in particular, are concerned about the ability to receive specialized medical care via telemedicine consulting. Medical consulting through telemedicine technology has proven to be problematic because the physician does not, in fact, physically examine the patient (Young, H.J.

& Waters, R.J., 1998). Some have questioned whether remote consulting should even be considered medicine. In addition, current HCFA guidelines are unclear as to whether medical services provided under "store-and-forward" technologies are reimbursable. Some critics believe that policy should recognize the legitimate diagnoses of licensed specialists whether they are transmitted live or "stored and forwarded."

Related to this issue is the status of a physician's license for offering consultation or services through telemedical facilities. Each state licenses physicians practicing within its borders. However, telemedicine offers the capability to pull in specialists from outside the state on certain cases. While Texas does have enough "experts" to satisfy any need to consult with a specialist in the state, there may be occasions when either access or convenience factors lead medical providers to consult with people outside of the state. The ability of such physicians to offer services to Texas patients when they are not licensed within Texas may be subject to professional and state scrutiny. Overall, states vary in their regulation of medicine and their requirements for, and acceptance of, telemedicine. Federal policy has been slow to rectify this issue, but it is beginning to be addressed as the use of telemedicine continues to grow. The provisions under Universal Service under the 1996 Telecommunications Act should help this process insofar as they provide some funding for telemedical efforts.

B. Telemedicine in Rural Texas

Rural Texas lacks sufficient medical facilities and personnel. A 1995 report notes that 24 rural Texas counties have no primary care physician, and 21 have only one; another 55 counties have no hospital, and shortages of health care personnel exist in more than 107 rural Health Professional Shortage Areas (Zetzman, 1995). Eighteen percent of Texas' population lives in 204 counties but only ten percent of the registered nurse population serves them. The nurse-to-population ration in rural Texas is 1:369, while that in urban areas is 1:183, as cited in Pickard and Bond (1995). Most of the state's telemedical applications have been conceived to redress such shortages.

Texas Tech University Health Sciences Center in Lubbock is representative of some of the telemedical facilities around the country. It operates HealthNet, a multiple application network

that provides interactive video consultations, teleradiology and data services throughout the surrounding geographic region (about 135,000 square miles). It uses dedicated T-1 lines (which are the equivalent of 24 typical phone lines) to link rural hospitals and clinics to the intercampus telemedicine backbone network. Nurse practitioners, important providers in rural health clinics, are linked to regional hospitals via interactive video, where physicians can supervise their care-giving. Direct diagnostic and consultative support by specialists or emergency room physicians at one of four Texas Tech campus sites is provided on a scheduled or an as-needed basis either to the rural health clinic or to doctors at rural hospitals. The TTUHSC Rural Health Satellite Network also uses satellite links to provide various services (educational) to rural sites. Various continuing education efforts are routine on the HealthNet network, many of them satisfying Continuing Medical Education requirements.

Other telemedical efforts in Texas include:

- A distance education program for training nurses (University of Texas at Arlington School of Nursing plus Texarkana Community College, East Texas State University at Texarkana, McLennan Community College in Waco, Grayson County Community College, and Paris Junior College);
- Separate programs providing Emergency Medical Services Training to rural areas through a clinical campus of Texas A&M University Health Science Center (audiographics, a narrowband service), the Texas Tech HealthNet system (using satellite broadcasts for one-way video and audio), and a consortium of A&M campuses, NASA and the Mid-Continent Technology Transfer Center using real-time satellite video and audio;
- Tex-Link, a state program under The Texas Center for Rural Health Initiatives, that has supplied funds to help rural hospitals obtain equipment to purchase telecommunications equipment such as satellite dishes, video monitors, and so forth;
- The creation of a consortium of the state's academic health sciences institutions, state agencies and the Center for Rural Health Initiatives in order to enable hospitals in rural Texas to receive on-site, cost-effective continuing medical and health education;
- The South Texas Distance Learning and TeleHealth Network Telecommunications Systems links the UT Health Science Center at San Antonio with remote clinical training sites

throughout South Texas. This operates through the Area Health Education Center program; and

- The Golden Crescent Interactive Network, a high speed data, voice and video network serving a 15-county region of Southeast Texas, provides information and communication access to business, education and health care organizations in the region. Partners include rural hospitals, community colleges, and the UT Medical Branch at Galveston.

Area Health Education Centers

Area Health Education Centers (AHEC) are part of a federal program that is administered by the Department of Health and Human Services, Bureau of Health Professions, Division of Medicine. The program's mission is to "improve the supply and distribution of health care professionals, with a multidisciplinary approach to primary care, through community/academic educational partnerships, to increase access to quality health care" (Texas Journal of Rural Health, Volume 14, 2nd Quarter 1995, p. 88). Texas has three AHEC territories: West Texas AHEC (4 regions, 105 counties), South Texas AHEC (5 regions, 38 counties), and the East Texas AHEC (8 regions, 111 counties). An academic health sciences center serves as the hub of each AHEC region. A map of the Texas AHECS can be seen in Appendix D.

AHEC regions undertake various telemedicine programs linking the academic health sciences hub with regional facilities for training and/or medical services. For example, the Golden Crescent Interactive Network in the East Texas AHEC (the hub is the University of Texas Medical Branch at Galveston) created a high-speed data, voice and video network in a 15-county region of Southeast Texas. The core of the network is the Golden Crescent Interactive Video Network Inc., a nonprofit regional consortium incorporated in 1993 with over 75 public and private sector organizations in the Gulf Coast region. Broad access and use are integrated into the network design, which links five rural communities (Beeville, Cuero, Hallettsville, Port Lavaca, and Wharton) with Victoria and UTMB in Galveston. The idea is to share various facilities within the region, including libraries, Internet access and education.

The AHECs could be very useful in providing the network and institutional support for regular training in conducting sexual assault examinations. Their infrastructure and locations make them potentially excellent resources for various continuing medical education purposes. Beyond this, the model of the Golden Crescent consortium is one we expect to be replicated around Texas as more interest in and resources for community networks grow. The Telecommunications Infrastructure Fund plans to fund community networking efforts, and certainly telemedicine should be incorporated into those community services provided through network capabilities.

C. Telecommunication Infrastructure

The telecommunication requirements for consultations in the current CJA project are minimal at this stage; the system basically depends on a dial-up modem that can access a line attached to a computer so that images can be transmitted and received. The image files are not unduly large. There is not a real time aspect to this particular use, and indeed, store-and-forward modes for medical consultation are widespread across the nation, with good reason: they offer physicians a great deal of time flexibility and allow patients to go on with examinations on normal local clinic schedules.

Telemedical efforts that depend on real time for examinations, treatment recommendations or consultations are much more difficult to organize, and insofar as they may entail live video images of patients and physicians, they are much more bandwidth-intensive. The amount of bandwidth required for a particular application is directly proportional to the cost of the connection: more bandwidth means a greater cost. Thus, sending an image file over computer lines is relatively cheap (the cost of a long distance phone call) whereas a two-way video conference could be thousands of dollars, depending on the session's duration.

One particular element that is important in Texas is the cost entailed in crossing Local Access and Transport Areas, or LATA lines. These boundaries define when a call becomes a "long distance" call. Texas is a large state and has several LATAs. Whenever a call crosses these boundaries, costs escalate. Nonetheless, we can expect many new wireless services to emerge in the next two years which may offer some relief from the charges entailed in crossing LATAs. Additionally, the long distance carriers that are required to carry cross-LATA traffic are

deploying more "points of presence" or POPs throughout the state so that costs may eventually decline.

The NTIA report on telemedicine noted earlier provides suggestive cost information (p. 72) as noted in the table below. The problem with considerations of advanced infrastructure in Texas is that it may not be available in rural areas. Southwestern Bell is the state's dominant carrier (77% of access lines), followed by GTE (13% of access lines); much of rural Texas is served by smaller phone companies. The capabilities of systems serving rural areas do not match those in urban areas. Where advanced facilities are available, their cost may be considerably higher than the comparable capability cost in urban regions. Nevertheless, costs for long distance services (those that cross LATAs) generally are becoming lower.

An expanded sexual assault examination program that may require more training time could entail more extensive telecommunications requirements, both in terms of users' time and bandwidth. Were training to be conducted in real time, in particular, dedicated lines would be essential and relatively costly as well, particularly if they cross LATAs.

Table 1: Suggestive Costs for Bandwidth Capacities

Bandwidth	State/ site	Dedic'd Line	Cross LATA	Miles	Installation Charges	Fixed mo. cost	Per use cost
112 kbps	MT-Ronan	N	Y	600	200	200	$0.53/min
ISDN (>128Kbps)	KS-Atwood	N	Y	80	0	545	$0.04/min
T-1 (1.5 Mbps)	Mt-Glendive; NC-Edenton NE-Callaway	Y Y Y	N N N	72 53 63	$1200 1250 427	$1,187 1,869 1,917	--- $0.25- 0.70/min
ATM (155Mbps)	NC-Chapel Hill	N	NA	NA	3300	2992	$0.38/min

Source: US Department of Commerce, National Telecommunications and Information Administration. (January 31, 1997). Telemedicine Report to the Congress, p. 72.

One final aspect of the telecommunications infrastructure that should be noted is the potential use of the statewide backbone network managed by the General Services Commission (GSC). The GSC provides support services to state agencies in acquiring telecommunications services and facilities. The Telecommunications Services Division of GSC manages the state-owned

telecommunications services used by state agencies and operates TEX-AN, the Texas Agency Network.

TEX-AN, the largest state telecommunications network in the nation, is a statewide network for voice and data with nodes within each Local Access and Transport Area (LATA) of the state. The GSC leases its facilities from various telecommunications providers such as Southwestern Bell and AT&T, obtaining bulk discounts through its bid process because it commands so much telecommunications traffic. TEX-AN serves over 4,500 locations with more than 25,000 circuits statewide. The GSC supports many regional 911 commissions with six nodes of their TEX-AN network. It also provides access to the State Poison Control Center network. One particular advantage of GSC's system for state agencies is that it is able to command very good rates for its network because it obtains bulk discounts from its vendors.

This network could be useful if CJA's expansion plans include regional training. Because the network has nodes at various universities as well as other sites, it may be possible to use it to provide cost-effective, shared continuing education to multiple sites. The network also may be useful for various other purposes as long as there is a state-related agency that accepts the bill. In other words, the network is not available to a rural health clinic that is not somehow affiliated with the state. However, if that clinic is in communication with a state university, and the university is responsible for the telecommunications costs, the network could be used.

D. Additional Resources

The table below lists some sources for additional telemedical information. Many of the offices listed maintain grants programs that may be available for CJA's expansion projects. Numerous telemedicine-related journals maintain online resources that could be useful in staying current on telemedicine developments.

Table 2: Websites for Additional Resources

Office of Rural Health Policy	www.nal.usda.gov/ric/richs/
National Telecommunications and Information Administration, including their TIIAP program	www.ntia.doc.gov www.ntia.doc.gov/otiahome/tiiap
Federal Drug Administration	www.fda.gov http://www.fda.gov/cdrh/telemed.html
Telemedicine Information Exchange (TIE)	http://208.129.211.51/
Journals: Journal of Telemedicine and Telecare; Informatics Review (available through Medscape); Telemedicine Today	http://www.qub.ac.uk/telemed/jtt/index.htm http://www.informatics-review.com/l http://news.medscape.com/LWW/TVR/public/TVR-journal.html http://www.telemedtoday.com/
Rural health Care Corporation (under Universal Service)	http://www.rhccfund.org/

IV. *Second Opinion* Software

Second Opinion is a software product developed, marketed, and supported by Computer Based Alternatives, a software development company based in Harbor City, California. *Second Opinion* was developed specifically for use by physicians and health care professionals as a way for them to document and consult with each other about suspected incidences of child sexual abuse. Computer Based Alternatives offers other products in addition to *Second Opinion;* however, by design, *Second Opinion* is the least technically advanced. This is because the end user population for which the product has been developed does not need traditional telemedical support tools that allow real-time, high-bandwidth graphics telecommunications capacity. Instead, research shows that this user population requires a user friendly, accurate, reliable, secure, and "low-tech" tool that can facilitate the ad hoc, on-demand, sharing of images among examiners. Guiding the development of product features has been an established pediatrician in California and expert on child sexual abuse, Dr. Astrid Heger. Dr. Heger sought out a vendor that could develop a software application specifically to support this medical specialty.

In most instances, *Second Opinion* is used as a communications device whereby images indicating possible child sexual abuse are sent and received by health care professionals working in distant locations. In other words, *Second Opinion* allows health care professionals practicing

in diverse geographic locations to capture, store, and then forward electronically to each other, images captured during examinations of suspected child sexual abuse.

A. What Is Needed To Get Started

The current practice of conducting child sexual examinations requires the use of some sort of photographic device accompanied by image and data capture tools and equipment that allows those images and data to be shared with other healthcare professionals, regardless of location. What follows is a description of both the equipment and tools necessary to use *Second Opinion* software. Note, however, that this discussion does not address image devices such as digital cameras, colposcopes, or video cameras.

1. Hardware Equipment and Telecommunications Capacity Needed

For security reasons, using *Second Opinion* in a clinical setting requires that the computer that actually runs the *Second Opinion* software be a dedicated computer (used for no other purpose). For storing and processing images and patient data, all of the following are required:

- An IBM-compatible computer (486DX-33 or faster) equipped with the following: 1) a minimum of 16 MB of RAM; 2) at least 50 MB of available hard disk space to enable the facility to store images directly on the computer hard drive (the software requires 1 megabyte (MB) of disk space for each images stored on the computer's hard drive); and 3) an accelerated SVGA graphics board;
- A computer monitor, a keyboard, and a mouse;
- A modem and modem connection (at least a serial analog modem with a standard telephone line, or an Integrated Services Digital Network (ISDN) terminal adapter with an ISDN line); the modem's telephone connection is usually in the same room where the computer is located (the modem has to be installed before adding *Second Opinion* to it);
- Operating software: Microsoft Windows® 3.11 or newer;
- Graphics software to interpret graphic images.

Depending upon how a medical examination facility chooses to capture images, any or all of the following equipment are also required:

- If the facility plans on scanning images into *Second Opinion* software, the facility will need a TWAIN-compliant scanner with its Windows driver installed on the computer being used for *Second Opinion*.
- If the facility plans on videotaping images and then inputting them into *Second Opinion*, the facility will need a VCR and a monitor.
- If the facility plans on capturing images using a colposcope, then appropriate cabling is required, along with a video card.

2. Software

The *Second Opinion* product consists of several distinct software modules, each of which is priced separately.

Required module:

- **Image Management Program** - this software module 1) handles the capture and management of all image and patient data, and 2) provides interactive email capabilities for sending/receiving images (sending images using email avoids expensive long distance charges).

Optional modules:

- **The Communications Program** supports customized communications functions, i.e., the sharing of images among other *Second Opinion* users on a point-to-point basis. The program also includes real-time viewing (again, point-to-point) and annotation of images between communicating sites. This program can be run as a stand-alone product.
- **Customized DataBase Plug-Ins** are also available. These are developed based upon customized requests from users.
- **The Public Conferencing Program** supports point-to-point and multi-point real-time conferencing about images captured and stored on participants' computers.

B. Product Features

The entire suite of software just described is a stand-alone (not networked), PC-based (using Microsoft Windows), image management software program with a communications capability

allowing the storage and forwarding of images obtained from a medical examination. What follows is a general overview of software input, processing, and output features.

As later findings will demonstrate, the way the software product is configured and its accompanying tutorial do not directly map over the users' experience of the software. Most users are very concerned with output features, but *Second Opinion*'s documentation is geared for the typical functionalities that each separate aspect of the software provides.

1. Capturing Images and Patient Information

Second Opinion can accept a variety of inputs: x-rays, slides, negatives, photo prints, image files captured by other image processing programs, and video. Methods for capturing images created in a variety of ways include

1) scanning still images directly from photographic negatives, developed prints, and/or slides;
2) capturing video images from a VCR tape or from a videoscope device of some kind;
3) importing into *Second Opinion* still images that have been generated by numerous other software programs (using a wide variety of file formats), and
4) feeding still images directly from a digital camera.

The process of capturing and storing images using *Second Opinion* software is a step-by-step process as described below.

a. Step 1: Establishing Image-Processing Controls

A few steps must precede the actual capture of video images. The user first needs to set certain controls so that the image will have the right magnification.

b. Step 2: Setting Up a Patient Folder

Before an image can be captured and then stored by *Second Opinion*, the user must also set up an electronic patient folder into which the patient’s images will be placed/stored. There are three different screens for adding this patient information. The "Identification" screen contains the only required pieces of information: first name, last name, and patient ID. All remaining patient information is optional. Other information on the Identification screen includes social security number, ethnicity, language, religion, and any private notes that the medical examiner wishes to

add. The "Address" screen carries mailing information, and the "Information" screen allows users to enter information about the patient's guardian, next of kin, examiner, insurance, and referral data.

c. Step 3: Capturing Images

Once the patient's full name and patient ID have been entered into a patient folder, the user is free to add images to that patient's folder. Depending upon the storage capacity of the computer being used, any number of images can be stored. (According to the software documentation, users should allow one megabyte of storage capacity for each stored image.)

The patient's folder must be opened in order to carry out the steps that follow. If the medical expert is using a colposcope to examine the patient, a variety of displays is possible depending upon the preference of the examiner. Some examiners prefer to capture images while actually conducting the patient examination. Others prefer to conduct the examination, capture images on videotape or other sources, and then later review the video, prints, or slides and decide which of these they want to store in *Second Opinion*.

1. Capturing Images During the Examination

Examiners typically use a digital camera or a colposcope to magnify the area being examined. Either of these devices allows the images being created to be displayed by a VCR, a computer monitor, or a camera attached to the colposcope. Examiners differ as to what kind of image they feel best represents the quality they are seeking. Some prefer to view the patient through the colposcope's eye piece and to take pictures using the colposcope's camera. Others prefer to view the image being captured by the colposcope on a VCR (referred to as "live" video). Still others like to view the image being captured by the colposcope on a computer monitor. Whichever method is preferred, the examiner must decide when s/he wants to capture a still image to be stored in *Second Opinion*. If the image is going to be a print produced by the camera attached to the colposcope, the examiner presses a foot pedal or a hand tool to snap the picture. If the examiner wishes instead to capture the image directly into *Second Opinion*, then either the space bar or the 'enter' key on the computer keyboard must be pressed.

2. Capturing Images After the Examination

Some physicians prefer to decide which images they want to store in *Second Opinion* after they have completed an exam. In these cases, images from the colposcope or digital camera are processed as slides, negatives, or prints, and then scanned into *Second Opinion*. Likewise, videotape footage can be played and specific parts can be captured as still images in *Second Opinion*.

d. Step 4: Saving Images in Patient Folders

After capturing an image, but prior to "saving" it in the computer, *Second Opinion* requires that the user set image compression instructions. Image compression settings affect how much time it takes to transfer an image over telecommunications lines.

2. Working with Images and Associated Patient Data

a. Image Manipulation

Once an image has been stored in a specific "patient folder," users can use various software tools to highlight and annotate an image prior to sharing it with another medical expert. For example, the user may want to comment about a suspected finding and do so by adding text, drawings (lines, rectangles, polygons, circles, or freehand graphics), and measurements directly on top of the stored image. Measurement tools allow users to

b. Managing Patient Information

Information about specific patients is managed in patient folders. The list of folders can be displayed alphabetically or by patient ID. Deleting a patient folder results in deleting all images stored within that folder. Examiners and their staffs may add, change, and delete information on the Identification, Address, and Information screens.

3. Sharing Images and Data with Other Medical Experts

Second Opinion allows users to send images directly to other medical professionals directly using a privately held list of modem numbers. Users can also send images using email. At present, there is no standard reporting feature for the software; however, the Computer Based

Alternatives has developed some prototype applications for specific users in a beta test environment. These are available upon request from the software company.

C. CJA Project Participants' Assessment of Second Opinion™

As previously mentioned, TIPI researchers conducted in-depth interviews with medical professionals working at all of CJA's designated "centers of excellence," with some of CJA's satellite sites, as well as with medical professionals using *Second Opinion* software in other states. (For a complete listing of those interviewed as part of this evaluation process, consult Appendix D.) In every case, interviews revealed overwhelming satisfaction with *Second Opinion*. What follows then is a synthesis these various assessments organized into several key topic areas. The section concludes with a discussion of enhancements to *Second Opinion* that were proposed by interviewees.

1. Product Pricing and Cost

We were surprised to learn that software product pricing and the telephone line charges associated with peer review and consultation sessions were not a major concern for most of our interviewees. Most sites had never had experience with any other software for this purpose, so they had little basis for comparison or "sticker shock." Most of the examiners we spoke to work within an existing clinic or hospital setting. Few had information about the actual technology and telecommunications costs associated with their examination program and its role in the CJA pilot project.

At the Lubbock site, for example, none of the second opinions provided to participating telemedical network sites are billed: the "normal" channels pay for these exams. At present, Lubbock doesn't log their costs. To date, the person we interviewed reported that no one had made inquiries into operational costs; hence, participants are not tracking these charges. We did learn, however, that their dedicated line charges for current monthly transmissions run anywhere between $25-30. When asked, this monthly charge seemed consistent among most sites.

San Antonio was the only site that expressed some concern about project costs because this site had been convening regular peer review sessions among the other Texas participants in the pilot

project. For example, one AT&T conference call bill totaled $118. As a result, the program director, Dr. Nancy Kellogg, has decided not to host any more multi-call sessions.

2. Installation, Startup, and Training

TIPI researchers asked about the training required to enable new staff to gain expertise using *Second Opinion* software. Medical personnel at the San Antonio site reported that this requires about one week of training. During that week, participants not only learn to use *Second Opinion*, but they also review slides, observe exams, and master certain criteria for detecting abuse. A staff nurse who was on site during this interview remarked however that one to two months is actually required to become fully conversant with the software.

When asked how long it took to set up and learn *Second Opinion*, participants at the Galveston site expressed disappointment that *Second Opinion* is not a complete "turn-key" system. Tasks such as getting the approproate hardware purchased and installed is difficult for computer novices. It is time consuming to determine the appropriate interrelationship between/among all of the peripheral equipment needed. Urban sites that have staff dedicated to helping with computer hardware and software problems might not find this to be a major problem. However, the same may not be true for participating rural sites. For example, an outside vendor was required to set up the software system for the Galveston program because Computer Based Alternatives is only a software, not a hardware vendor. After installation, the Galveston program had difficulty with its equipment and had to interact with outside vendors who were not very skilled at setting up the system properly. Interviewees noted that installation would be a trouble spot for satellite centers with little technical expertise.

3. Overall Usability

There appeared to be a wide variety of levels of familiarity with specific features of the software. Also, several sites had not updated their software with the most recent version. The issue of a varying level of expertise is an important one when determining how *Second Opinion* training might be conducted for a potentially much larger network of users.

a. Capturing Images and Patient Information

Responding to our questions about accuracy, several users noted that the software is only as good as the colposcope or digital camera that serves as the capture device for the images to be stored in *Second Opinion*. In other words, to capture "accurate" images, the user must already be skilled with the image capture tools themselves. Another user added that capturing an image requires pressing a computer key and that this requires having another person present during an exam. This becomes somewhat cumbersome for examination sites with only one trained examiner.

Other users reported that the areas for capturing patient data on *Second Opinion* aren't very extensive; very few input fields are required. These users felt that the software works more like a court reporting machine than an archival tool. Also, some data fields present slight stumbling blocks. For example, the software doesn't accept multiple date formats; the full year must be entered, instead of simply some such as "98." Several user also commented that they don't fill out all of the demographic information because of confidentiality; they may use only initials to link up the images with actual physical medical records so later only *they* can match up the image with the specific case.

Another input issue that emerged during the interviews with users of *Second Opinion* was the fact that the magnification levels of images shared between sites using *Second Opinion* may not match. Less experienced sites need to be informed that they must note before sending an image what magnification level was used so the receiving site can adjust the received image accordingly.

b. Working with Images and Associated Patient Data

Some users found it cumbersome and somewhat limiting from an operational perspective to require a dedicated computer for *Second Opinion*. Those sites that have the dedicated computer in an exam room can't input, update, or print out needed images and/or patient data while that room is in use for other purposes during the day or in the evening. Also, some users found updating *Second Opinion* to be somewhat cumbersome. For example, they mentioned the inability to import images into a new account. They also mentioned that they would like to be

able to delete images already stored. (Apparently, for legal reasons, it is important to disable manipulation of captured images that have been time/date stamped.) Other users indicated that the images received from other sites are often too red. This is not correctable in the software, that is, it is not possible to manipulate an image that has been received from another site. It is possible only to brighten, darken, or change the contrast of an image. Many users commented that the images never resemble the color of real skin. Instead, the skin is always pale or dark red. Still others added that the overall resolution could be better, and that moist tissues render too many highlights. Finally, several users reported that it is easier to work with video than with still images. For this reason, if not already on the drawing board, Computer Based Alternatives might want to consider the use of "streaming video" in addition to still image support. Also, a different end-user noted that a slight "glitch" in the software was its default setting to "female" when the patient's gender is not key-entered. Most, but not all, patients are female. The software users that reported this default feature said they did not notice until some time later that their male patients were being coded as females.

c. Sharing Images and Data with Other Medical Experts

Given that sharing images among medical practitioners is the primary reason for using *Second Opinion* software, this area of usability rendered the most comments from the users that we interviewed. For example, a major area of concern was the inability to produce output reports reflecting patients' demographic information. Several users mentioned that initially they had been inputting patient data, but because *Second Opinion* does not produce any preformatted reports, they stopped entering patient information altogether (with the exception of the required data fields). Other users expressed concern about the time required to send images to participants in a peer review situation, for example. They reported that it is time consuming to dial each number and wait for a response in order to send images. And because not every site in the closed network leaves its system in "unattended" mode, it is not possible to store and forward images without first having to call the receiving site and ask them to set their software to receive images. Peer review is the only instance in which the multiple-send feature is required. Consults are usually conducted between one, two, or three people. However, with expansion, peer review and consult volume will most likely increase and this may be of concern to network participants.

Related to this issue is the fact that, for confidentiality reasons, *Second Opinion* is a closed system: its users cannot transfer images over the Internet, except as attachments using email which are not entirely confidential. For some users, it becomes difficult to review or transmit images during normal working hours.

Another usability concern is the fact that sending an image stored in *Second Opinion* must first be "opened" as a file before it can be sent. This is apparently very time consuming. At present, one must first open an image file, send it, close that image file, open another, send that one, and so on. One user asked if it would be possible to select several (but not all) images from the images available for a specific patient, and then send those images as a group, or "batch," of images.

Other users pointed out that the "dedicated terminal" configuration of *Second Opinion* means that the user must go where the computer terminal is, not where the user is located. This makes *Second Opinion* very site specific, unlike telemedical applications in radiology, for example, where images can be sent to a physician at home. This complaint relates to the fact that, at present, the product is not network compatible and that the dialup modem issue is a barrier to more frequent use of the software.

The software's proprietary file format also is somewhat cumbersome in that it is not easy to export to another program, to prepare a PowerPoint presentation that uses images from *Second Opinion*, or to make a slide from an image stored in *Second Opinion*. Images stored in *Second Opinion* are very large datasets, and often it is necessary to move an image from the hard drive dedicated to *Second Opinion* and onto a diskette and then move the image to another computer. However, to get the best image, more than one diskette might be needed. Also, to some users, it is a nuisance to carry a diskette; some participants suggested that it would be better to load *Second Opinion* software onto a "live" network with the right kind of security in place which would enable the review of images from a remote computer, for example.

4. Best Uses & Features

Users identified substantial benefits using *Second Opinion* that related to training, to the software's potential for organizing case information (particularly longitudinal, aggregated information), to the software's flexibility in offering delayed consultation (non-real time), and to its potential for aiding rural areas that lack the necessary medical expertise.

Most agreed that *Second Opinion* is an excellent teaching/training tool for medical residents, nurses, and physicians because it makes it possible to "show" what is "normal" and to compare this with "abnormal" findings. In many instances, capturing images of a patient that do not result in any abnormal findings can be useful because if there is a repeated instance of abuse, the software allows the capture of a baseline with which to compare more recent findings. Also, *Second Opinion* allows a student to "see" and to ask questions without having to look at the patient's anatomy directly, which is sometimes uncomfortable for the patient.

Another benefit is the software's potential to serve as a medical evidence casefile. Because the software doesn't allow the saving of new images without first capturing a minimum amount of information about the patient (the "required" input fields discussed earlier), data capture of patient information is a natural stepping stone to the use of images. In other words, it is not possible to create a new image file until identifying patient information has been entered. Further, the advantage of the colposcope image stored in *Second Opinion* is that it actually labels the images with a time and date stamp. This information is captured as part of the image stored in *Second Opinion*.

Peer review is a third important application for *Second Opinion* software. One of the most important requirements for child sexual abuse examiners is staying current. Because current guidelines and national standards are revised every two years, and because the medical terminology changes as expert consensus is reached, it is difficult for practitioners to stay up-to-date. When practitioners do not stay current, this hurts future opportunities for prosecution and investigation. With this in mind, peer review needs to be carefully conducted and controlled. If not done in a controlled fashion with good educational models, and most importantly, if there are

not major incentives to maintain connections with medical hubs, individuals might simply train and then practice independently. What is important, according to the people we interviewed, is improving the quality of care for children by capturing and maintaining images that can be peer reviewed on an ongoing basis. Reviewing with these images improves quality of care because the process increases education, individual experience, and communication among practitioners who no longer have to travel to be in contact with one another. Several of our interviewees mentioned that rural areas are most likely to benefit from using *Second Opinion* software because it is more difficult for them to come into contact with expertise in this medical area. Increased peer review helps to close the isolation gap among practitioners in distant locations and build and support their expertise. Also, the continued use of *Second Opinion* validates the people doing these exams as expert witnesses.

Another aspect that one user thought was *Second Opinion*'s best feature was the flexibility it offers in using either real time or delayed (store and forward) review of images. Unfortunately, however, few are using the product's "interactive link" feature for some very pragmatic reasons, i.e., when confronted with the schedule disparities among consulting physicians. Finally, it was mentioned that the software allows examiners to make comments on images; this was viewed as an attractive feature.

In summary, nearly everyone interviewed mentioned in one way or another that it is a benefit to be able to view images for multiple purposes, be it resident training, parental education, or reassurance to children (to alleviate fear when they can now see what is happening during an exam). Essentially, images make it possible to prove to a parent or others that what the physician saw was not just an opinion, but an actual physical finding.

4. Recommended Product Enhancements

While it is clear from the comments already noted that most users think *Second Opinion* is easy to use, several people made suggestions about ways to enhance the software. Regarding installation and startup, Galveston users commented on the fact that while the software was rather easy to install and u se, the associated hardware is not. They suggested that both software

and hardware be “bundled” so that sites don’t have to muddle through so many technical installation issues. A single vendor relationship was suggested instead of each site having to piece together vendors for each aspect of the technology needed.

Regarding output capabilities, several users reported that they were not using the software’s demographic capture screens (beyond those required to enable image capture) because there was no way to produce output reports. They commented that what was needed was a link to a common database system or program for capturing and maintaining confidential patient data. One user added that linkages to other databases are required as part of this type of work, for example, the Child Fatality Review. Echoing this interest in database support, Dr. Coffman in Longview recommended maintaining regional statistics.

A question remained as to how *Second Opinion* might be able to “feed” such a database so that double-entry would be required, making a log/audit trail available to CJA’s telemedicine network for recordkeeping. Users described how each site maintains its own statistics and uses different data collection forms. At present, most sites re-key CPS report information that is not captured by *Second Opinion*. For one user, preparing the monthly CPS audit report requires more than four hours (or 1 day per month). In summary, because funding for child sexual abuse examination programs seems an ongoing challenge, more cohesive data collection may enhance the efficacy of the program through better documentation. As a result, funds might be easier to secure on a long-term basis.

Several users made other suggestions about enhancements to the software, but it became apparent that those features already existed and simply weren’t being used, or they had been included in a software update that these users hadn’t yet installed. An example of such a suggestion was one user’s need to be able to capture on videotape and then later be able to play that tape and save only certain images in *Second Opinion*. Other users in CJA’s telemedicine network are already doing this, but for some reason, this user hadn’t tried this feature yet.

With this in mind, another enhancement that TIPI researchers concluded would be of some assistance to end users would be a videotape accompanying the software that teaches users about the product's different features. The instructional topics on such a videotape, however, should mirror how this user population employs the software, not a generic description of features and functions as is reflected in the company's current software documentation. Additionally, updates to software could be accompanied by a one-page written tutorial that users could quickly learn. Second Opinion provides a written tutorial, but it does not reflect how these medical practitioners actually use the software in the course of a typical day. Along these lines, another user said that it would be helpful to have an expanded on-line HELP feature that indicates which fields are required and which are optional (ex., for demographic information). Also, this user expressed a desire for more troubleshooting assistance (more "how to" guidance) for sending and receiving images.

Finally, there were two suggestions focusing more specifically on enhancements affecting overall usability. First, a foot pedal was suggested that could be linked to the personal computer in the same way that a foot pedal attachment is available for colposcopes. At present, the technology requires two people in an exam situation (one to activate *Second Opinion*'s capture key and the other to work with the patient). Another user suggested that *Second Opinion* incorporate an audio feature whereby examiners would be able to talk about and see images at the same time, using the computer as a kind of speaker phone. This user added emphatically that making a diagnosis doesn't just depend on obtaining a good image.

D. Other Assessments of Second Opinion Software

TIPI researchers were not able to obtain substantial comparative product or evaluative information from participants in CJA's telemedicine pilot project because most, if not all, of these participants had never used anything other than *Second Opinion* software. For this reason, researchers contacted child sexual abuse programs in other states (contacts made available to TIPI by Computer Based Alternatives) who had either conducted formal evaluations of various software alternatives or who were willing to talk about their experiences so far using *Second Opinion* software.

The Alaska Telemedicine Project was the most informative source, and apparently the only program that seems to have conducted any formalized comparative evaluation selection process. Overall, it appears that most users of *Second Opinion* outside of Texas are very pleased with the product's performance, especially with the level of support provided by the company to end-users. In general, very little training is necessary to begin to use the product and any necessary upgrades and product enhancements are provided by *Second Opinion* upon request. Product documentation seems satisfactory, and different institutions are coping with the costs of acquiring the requisite hardware and software in unique ways.

1. The Alaska Telemedicine Project

The Alaska Telemedicine Project is a public-private consortium of health care providers, telecommunications carriers, representatives from the University of Alaska Anchorage, and the State of Alaska. Formed in 1995, the Project's goal is to improve the delivery of health care in the state through the use of telecommunications and information technologies. Alaska is a prime test case for telemedical applications because it is challenged with a large terrain, few roads and many rural villages with access to varying degrees of telecommunications services. Two projects in particular share a common goal of linking the Alaska Native Medical Center in Anchorage to five regional hospitals, which in turn link twenty-seven villages in rural parts of the state. Several needs were identified to enable health care professionals in these different locations to communicate and share information with each other using a unified software solution that offered, minimally, the following features: store-and-forward of medical-grade images, patient records, email, and the ability to port patient information into existing hospital information systems. (A more extensive list of specific features and functions can be obtained by referencing the actual evaluation report.)

To find a unified software solution for Alaska's telemedicine initiative, in the summer of 1997, a statewide meeting was held in Anchorage to evaluate a software vendor. This meeting involved health care providers, administrators, information systems professionals, and representatives from the state's public health agency, the telecommunications industry, and non-profit and for-

profit tertiary health care facilities. A thorough search of all software vendors that either designed or distributed telemedicine software supporting store-and-forward technology was conducted. Qualified vendors were then invited to come to Anchorage for a 3-day demonstration period. The following companies accepted this invitation:

- Access Radiology Corporation, Mt. Vernon, Washington
- American Medical Development, Lowell, Massachusetts
- Computer Based Alternatives (*Second Opinion* Software, LLC), Harbor City, California
- First Class/CHAIN, Barrow, Alaska
- Global Telemedix, Westford, Massachusetts
- Image Labs, Bedford, Massachusetts
- Medvision, Inc., Minneapolis, Minnesota
- Multimedia Medical System (MMS), Reston, Virginia
- VCOM Systems, Sausalito, California

At the 3-day meeting, evaluation participants were placed into one of six evaluation teams, depending upon their expertise: 1) the user interface as evaluated by community health aides and practitioners, 2) the user interface as evaluated by medical personnel, 3) forms and the hospital information system (HIS) interface, 4) connectivity/compression, 5) system administration, and 6) import/export features. (Note: the forms used for this evaluation, information about the composition of each evaluation team, scoring methods, and other details about the evaluation itself may be obtained from TIPI, if necessary.) What follows is the final outcome of Alaska's software evaluation:

- *Overall Impression*: *Second Opinion* ranked most often as “best software”
- *Ease of Use:* Again, *Second Opinion* ranked most often as “best software”
- *Overall Capability*: MMS ranked higher than *Second Opinion*. The evaluation report explained this as a “trade-off between software capability and ease of use. As software becomes more complex and offers greater capabilities, it often becomes more complex and more difficult to use” (Ferguson, 1997, p. 76).

The report concluded by stating that "*Second Opinion* offered the best combination of customizable and flexible features as well as one of the better import functions tested."

2. The Center for Child Protection in San Diego, California

TIPI researchers also interviewed Dr. Marilyn Kaufhold who is director of the sexual assault program at the Center for Child Protection in the San Diego Children's Hospital. The Center is using *Second Opinion* software as part of its three-year grant from the State of California to provide training related to physical abuse of children and the elderly, including sexual abuse. An immediate goal of the program is to increase the number of health care practitioners who are trained to perform child sexual abuse examinations.

What is interesting about this program as a model for Texas is the way in which San Diego is developing a common statewide curriculum for different types of health care professionals: physicians, physicians' assistants, nurse practitioners, and SANEs. Equally interesting is how the program is organized to support rural professionals involved in child sexual abuse examinations and how examiners are reimbursed for their services.

The program's strategy is first to identify leaders in the field and then to make sure that these leaders are in touch with one another. The challenge then becomes how to extend their expertise into other parts of the state. The San Diego program believes that having a state examination protocol is important. However, to put that protocol into practice, hands on training and supervision are required. At present, practitioners come to the San Diego center for a one-week training session. Also, once back in the field, satellite sites conduct exams and then the San Diego center reviews all of these exam results, not just the best or the worst cases. Regular peer review sessions are then held with satellite centers twice a month. Because these case reviews are conducted in the context of a hospital committee, the images used during the process are protected and not available to law enforcement or social services. In other words, individuals doing exams must stand behind their opinions, and the case review process provides these examiners with a certain level of comfort in the event that their cases ever go to court. If a case does go to court, Dr. Kaufhold suggests to the satellite site that they instruct the district attorney

to request a formal second opinion from the San Diego center. In the event that this happens, any previous peer review on the same case is never mentioned. According to Kaufhold, this is practicing good medicine in that the Center can ensure that 100% of their cases are peer reviewed which "covers the bases." The Center can provide this backup confidently because it was involved in the case review and therefore is equally knowledgeable and qualified about the case in question.

Dr. Kaufhold would prefer that all physicians testify, but she added that the reality is that there are more nurses willing to do this than there are doctors. According to Kaufhold, in many cases, nurses are "put on a line that a doctor isn't." Hence, the Center supports those nurses in doing exams, going to court, and writing reports. Courts use the information and physical evidence stored in the patient's record or chart, not the *Second Opinion* images.

On the subject of reimbursement, California law states that anyone who is a victim of sexual assault is entitled to an exam at public expense. Exams are billed by the hour at a rate of $200 and the district attorney's office pays for these. Examiners also bill for court testimonies. When asked to go out of county in a criminal court case, a bill is sent to the attorneys that order the subpoena.

The San Diego Center selected *Second Opinion* primarily out of concern about the quality of images. Dr. Kaufhold thinks that the image resolution is excellent and that transmitting images over the network is almost as good as a photograph. However, she indicated that the Center plans to migrate to a digital camera instead of a 35mm camera because a digital camera allows magnification without losing clarity. Another reason for selecting *Second Opinion* was its encryption process that safeguards confidentiality to a certain extent.

3. The "CARES Northwest" and "CAMI" Projects in Oregon

TIPI researchers interviewed users of *Second Opinion* software at both the CARES (Child Abuse Response and Evaluation Services) Northwest Program based in Portland and the CAMI (Child Abuse Multidisciplinary Intervention) program in Salem, Oregon. The CARES and CAMI

programs provide CJA with some unique examples of how state-level coordination and support might be achieved.

CARES is a demonstration project funded by a statewide grant that helps support three regional assessment centers that act as consulting facilities for 10-12 rural clinics in outlying communities. CARES' aim is to establish a statewide telemedicine network in Oregon. CAMI is a legislatively authorized statewide grant fund that distributes monies to multidisciplinary teams in each of Oregon's 36 counties. These monies are available to support programs for investigation and prosecution of child abuse. As a participation requirement, each county is required to maintain an investigative protocol and a local child fatality review team. A 1998-1999 grant from the federal NTIA/TIIAP (within the U.S. Dept. of Commerce) program funds CAMI's hardware and software purchases. CAMI provides a program match by picking up local line costs.

CARES selected *Second Opinion* as a result of word-of-mouth recommendations by state-level personnel; no in-depth comparisons were conducted in their selection process. This was because the CARES program did not need anything complex; instead, the program required a low-tech product that did not require much technical or administrative support. Although CARES did consider *Second Opinion* rather expensive, they chose it over the option of piecing together something on their own which would have required considerable in-house expertise on an ongoing basis.

CARES project personnel use *Second Opinion* to share images between regional assessment centers and rural clinics. The rural clinics are equipped with an exam room, a colposcope, and *Second Opinion*; they do not anticipate obtaining any video equipment. The uniqueness of the Oregon program, in operational terms, is the fact that the regional center contact personnel carry pagers that alert them when rural sites want to send them images. Consults such as these are available from the regional centers between 9am and 4pm, Monday through Friday. Exam teams using the product at the regional centers include two physicians and one pediatric nurse practitioner. After paging the regional center, field personnel in the rural sites send an image.

Then, within about an hour, the regional center staff tries to respond with a phone call after having consulted the image that was sent to them.

The CARES program has its own program evaluation component and is also in the process of developing a research program focused on child sexual abuse. *Second Opinion* is part of its demonstration project. Beginning in February 1998, each of 12 outlying sites participated in an evaluation project by designating one individual as the *Second Opinion* lead person. Results from the First User Satisfaction Survey indicate that the majority of participants found software training helpful and sufficient. Additional highlights (both positive and negative) follow:

- Five centers said the costs of installing *Second Opinion* far exceeded their budgets.
- Users recommended the development of an ongoing mechanism for refresher training.
- A "hands on" component to training that closely mirrored the intended use of the software was also recommended.
- Eight centers reported examiners experiencing discomfort/uncertainty in using *Second Opinion* software.
- Half of the users reported installation barriers involving such things as having to wait longer than expected for equipment delivery, needing installation support, and having to fix hardware that was damaged when someone placed keys in the wrong ports.

Like CARES participants, CAMI representatives also gave *Second Opinion* high marks. They reported that *Second Opinion* support has been excellent. Also, when CAMI experienced some initial hardware problems, they noted that *Second Opinion* was "there for us all the way!" They added that the *Second Opinion* support team has been "wonderful to work with."

4. Utah's Indian Health Services Center

TIPI researchers contacted another user of *Second Opinion* software: a primary care provider who works for the U.S. Public Health Service in a family practice clinic on an Indian reservation in Ft. Duchesne, Utah. There was clearly a need for a sexual assault examination program there. The closest other facility for child sexual abuse exams is 150 miles away and over a mountain

pass, and this facility is also closed in the wintertime. On the reservation, the population served is all native Americans, both children and adults. The Center provides medical, dental, optometry, x-ray, and full service outpatient services. Because there are only two people in northeast Utah and west of Denver who have training in the identification of child sexual abuse, the public health worker we interviewed also serves the non-Indian community in surrounding counties.

Patients are referred to the Center by social services, the state or tribe, and/or the police. Since establishing the Center, word-of-mouth has resulted in an increase in referrals and more patients coming forward. What's unique about the Center is that Computer Based Alternatives has designated it as one if its beta test sites and has donated the software that is being used there. At present, the Center seeks four to five consults a month from either Dr. Astrid Heger in California or Dr. Leah Lamb in Texas.

The examiner is equipped with a colposcope which she uses to produce 35mm photos. She develops those photos and then scans them into *Second Opinion*. She saves the negatives as part of a permanent patient record, but not as part of a patient's chart. The negatives are kept under special security. The exam team is incident-specific which means it may involve a mother, a social worker, a nurse practitioner, nursing students, or medical residents.

Depending on nature of the injury, different numbers of images are saved. If the exam is normal, the examiner may capture 3-5 photos. If it is abnormal, there is more to document. Depending on the nature of an injury, there may be a need to document healing 1, 2, or 6 months later. As far as data collection is concerned, the Center does not use *Second Opinion* software for this. Although the state of Utah does not have an official child sexual abuse exam form as do California and Arizona, one is currently under development. At present, the only use being made of *Second Opinion* software is image capture.

When we asked whether the $6,000 software price tag was expensive, the response was, "compared to what?" For a small rural clinic, our informant reported that "that's a 'chunk of

change' and with managed care, you have to consider cost." The site can't even afford a video capture board which costs around $800, but according to the interview, experts in the field seem to believe that the 35mm has higher quality images than video. The gold standard at present is the colposcope, not video or a digital camera.

The center uses *Second Opinion* primarily as a communications tool. When asked why *Second Opinion* was selected over other software packages, our informant answered that she uses it because the people who trained her used it. Also, the one other person who works with this application of telemedicine in the state also uses it.

The features that received the highest praise included the fact that the new software edition captures voice which can be played back as part of the image; in other words, it is now possible to store and forward voice annotated images. Also, the ability to measure things right on the screen and the ability to calibrate the software were both highly valued features. Training takes little time, the software is very easy to use, very accurate, and the people at *Second Opinion* received high marks for their software support services. Our informant noted, however, that if users are computer illiterate, it might be more difficult for them to learn *Second Opinion*.

To justify expenditures, the examiner noted that *Second Opinion* could also be used for other medical subspecialties, for example, dermatology and gynecology. For reference purposes, it is also equally valuable. An examiner could create a file of "normal" images to serve as a standard against which to compare other images. The only criticism offered regarding image quality was the fact that photos often appear to be too red.

When asked to comment on the overall impact of using *Second Opinion*, the examiner we interviewed remarked that all cases had been settled before requiring testimony. As yet, actual pictures have not been taken to court or shown to the judge.

Overall, having this technology has enabled children to stay in an environment that is familiar and to receive care from a provider whom they know and trust. Because travel is no longer

required, the family can be with the child during the examination process. Moreover, having access to national expert review lends credibility to the examiner's findings. As a result, perpetrators often plea bargain because they think they have been caught.

5. The University of Missouri School of Medicine at Columbia

The child sexual examination program in Missouri provides an interesting model of how one state has managed to organize and sustain its network of professionally trained sexual abuse examiners. Missouri is a largely rural state, so their sexual examination program at first, like Texas, was more of an informal network of experts in the state that supported medical professionals who only infrequently were called upon to do exams. Eventually, in 1989, the Sexual Assault Forensic Exam (SAFE) Network was established at the state department of health as a way for health care providers to be trained to do sexual assault exams despite where they lived. Operational funds were pieced together from numerous sources. Eventually, the department of health decided to discontinue funding for full-time personnel, so advocates of the program approached the state legislature, which eventually provided sustaining funds for the network.

The Council that helps direct the SAFE network meets quarterly and advises the program's director. Its members represent different geographic areas of the state, and they are seen as local/regional specialists. Since 1997, Dr. Lori Frasier has been SAFE's medical director. She has an academic appointment at the medical sciences campus in Columbia as an assistant professor of child health. The program began with nine health care providers and has now expanded to 200 individuals practicing at different levels of expertise.

The uniqueness of the program as a possible model for CJA's network in Texas is two-fold: SAFE is legislatively funded (with a current annual budget of $160,000), and as an incentive for participation, SAFE reimburses examiners for their services: a provider's level of reimbursement is tied to the level of CME that s/he has completed. At present, approximately 80% of examination services are reimbursed, and two-thirds of this reimbursement comes from

Medicaid. CPS, Medicaid, and law enforcement pay $175 for an exam although Dr. Frasier has asked that this be increased to $250.

The SAFE program is similar to CJA's program in Texas in that it operates in coordination with Children's Advocacy Centers, or CACs, at various locations throughout the state. In many cases, the CACs perform the interviewing function and then they call upon SAFE providers for any necessary sexual abuse exams. In situations where exams are performed at the CAC, medical providers contract directly from the SAFE program. This is a benefit in court when experts are asked "are you a SAFE care provider?" As a formal link to state CAC operations, the SAFE program sends a liaison to the CAC working group that meets every four months.

Dr. Frasier does not use *Second Opinion* to store patient data; she uses it mainly as a consulting tool, as a way to communicate with less experienced providers in the SAFE Network. In the past five years, research has shown that there is great variation in what examiners call "normal" findings. This research also indicates that 80-90% of children examined show normal exams even when there is a history of sexual abuse. This is because children usually heal completely.

According to Dr. Frasier, 20 of the 200 SAFE Network participants now have *Second Opinion* installed. All 20 sites also use a portable colposcope. With funds from the SAFE program, Dr. Frasier has provided five of these sites with $10,000 colposcopes. Examiners who receive a colposcope from the SAFE program must commit to sending images as part of their participation in the SAFE network. Originally, Dr. Frasier funded computers in addition to colposcopes, but has since determined that sites providing their own computer hardware indicate a stronger commitment to the SAFE program. Some of the examiners' computers might be at home, in academic offices, or in clinics.

The "still" sites use *Second Opinion* with a camera, not a video link, so a scanning device is also required. These sites might also use a digital camera. The fifteen "video" sites are similar to Dr. Frasier's installation which consists of a colposcope with a video camera feed. Dr. Frasier thinks that it is easier to use video capture with *Second Opinion* than to take still images and then scan

them. Video is more flexible because it allows the examiner to review the images later and then decide which of them to capture. Postponing that decision-making makes it easier to focus on examining the child, not simply obtaining the best image. Also, video provides a baseline in the event of a recurring sexual assault.

Most of SAFE's participating sites are clinics with a nurse available to perform sexual abuse examinations. Nurse practitioners working alone usually staff examination functions at CACs. Dr. Frasier believes that the best quality exams require two people. She never works alone but is usually assisted at least by a nurse practitioner, a nurse, and/or a medical student. Overall, SAFE care providers perform approximately 3,000 exams per year in Missouri.

For image-sharing purposes, Dr. Frasier leaves *Second Opinion* in "unattended mode." She also emails images without using *Second Opinion* although she understands that *Second Opinion* has an email component but she hasn't used it yet. Because the legislature monitors the program (requires a periodic report), soon Dr. Frasier will need to initiate a peer review process because the programs that she is funding are not sending her images at present. Some sites haven't installed the software yet.

Overall, Dr. Frasier thinks that *Second Opinion* is the best choice for her particular program, noting that there are not many other vendors that provide the same capability with as much security. Additionally, her assessment is that *Second Opinion* is fairly inexpensive in comparison to state-of-the-art telemedicine technology in general. At the same time, Dr. Frasier thinks that her program hasn't taken off as much as she had hoped because of the computer phobia associated with working with technology products in general.

6. The University Health Sciences Center at San Antonio

TIPI researchers also interviewed telemedicine/telehealth experts at the Center for Distance Learning and Telehealth at the San Antonio Health Sciences Center because of the Center's active involvement with the Area Health Education Center's telehealth projects in southern

Texas. At present, the Center is involved in developing its own image capture and management software. Features that the Center wishes to incorporate into their software include the following:

- store and forward capacity that includes video
- video and image capture using Microsoft Windows™
- audio and text capture
- voice annotation
- an "open systems" technology policy

In the process of development, these developers had an opportunity to review *Second Opinion* software and one of its competitors, MedVision. MedVision was eliminated early in the selection process because Center researchers discovered numerous software "bugs." After reviewing *Second Opinion* in some detail, the Center decided to develop its own software to support the 85 outlying health centers involved in their project. They indicated the following reservations about *Second Opinion* software:

- The email program, Eudora, can do everything that *Second Opinion* can do.
- All of the components of *Second Opinion* are free or next to free.
- *Second Opinion* doesn't do anything more than most computers cannot do right now (except for the capture card for a camera interface, which is purchasable for $200-220).
- *Second Opinion* is basically an integration product.
- *Second Opinion* is a closed system.

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Appendix A: *Second Opinion* Evaluations - Texas

SECOND OPINION EVALUATIONS: TEXAS SITES			
Location*	**Difficulty Level**	**Software Support**	**Comments**
Austin*	N/A	N/A	I don't have any experience with software; I'm completely "computer illiterate." I don't even know how to word process. And I don't have an email address. I like the fact that *Second Opinion* can come and set it all up. I've heard also that it's easy to work with.
Beaumont	1	1	You shouldn't put this equipment just anywhere. You need to establish some very strong guidelines.
Bryan	N/A	N/A	We have *Second Opinion* but no computer yet. We'll need major training.
Burnet			Being in a rural area with SANE nurses without *Second Opinion* makes me uncomfortable. They're called in when I can't help for some reason. Most of the cases in our areas are adults, so that means less exposure to rural SANEs of child sexual abuse. They're not experienced enough. With *Second Opinion*, there's no problem.
Corpus Christi*	2	4	*Second Opinion* is great on troubleshooting after you've gone through installing everything, but what's more important (especially for satellite sites) is up-front support in installation. On the other hand, it's a great way to build consensus and to provide a quality control mechanism. It's a great teaching tool as well. It's limitless how many sites could take advantage of it.
Dallas*	N/A	N/A	We're not using *Second Opinion* right now, but have learned a lot about it at peer review meetings. The medical quality is good, but not excellent, but then, there's not much to compare it to. Those doing peer review using pictures should keep in mind that pictures don't capture everything you see. That's not a function of the equipment.
El Paso*	2	1	We only use *Second Opinion* to share information among examiners. You have to keep your skills up. It's a fluid science. Within five years, things will change even more. Using *Second Opinion* helps demystify this work.
Ft. Worth*	?	?	I'm pretty sold on *Second Opinion*. From a medical perspective, the images are very accurate. It's also a very useful training tool. Customer service has been very supportive and responsive. *Second*

Key:

Difficulty Level

1=Very easy to use
2=Somewhat easy
3=OK
4=Somewhat difficult
5=Very difficult
N/A=not applicable; *Second Opinion* not installed yet

Software Support

1=Excellent
2=Very good
3=Good
4=Not very good
5=Not good at all/unsatisfactory

			Opinion even helped me design a database component for my own purposes.
Galveston*	1	1	It's great to be able to "view" the images for multiple purposes/people, ex., resident training, parents, kid themselves (to alleviate fear). Images make it possible to prove to a parent that what the physician saw wasn't just their opinion, but an actual physical finding.
Gonzales	N/A	N/A	CPS in our county approached me to setup a clinic to do these types of exams. I trained with Nancy Kellogg and am eager to start doing exams. We'll support the CAC nearby that will also be using *Second Opinion.* That way, people won't have to travel so much.
Lubbock*	N/A	N/A	We use *Second Opinion* mostly for peer review. It helps build consensus and a sense of reassurance that a judgement call is correct.
San Antonio*	2	1	We're having some trouble adjusting the color on the images, but we think it's probably more a monitor than a software problem. Dan at *Second Opinion* has been great, easy to follow, and VERY patient.
Longview	2	1	For remote diagnosis, using *Second Opinion* is not as good as actually being there. It's not even as good as 35m slides. However, for peer review, it's very helpful.
Wichita Falls	N/A	N/A	One of my anticipated benefits is being able to do peer review without driving!

**Indicates CJA Hub or "center of excellence"*

Appendix B: Interview Protocol

Date of Interview:
Site and site type:
Person(s) Interviewed:
Specialization(s):
Project designation: Hub or satellite?
Team:

If you support satellite sites (for consultations and training), where are they located? (In Texas, which counties/towns? Out of state - how many miles away? Radius of catchment area?) In other words, how many other sites/areas are medically supported by your site? Locations of those sites:

How are satellites technically and physically set up? What types of facilities are these? What kind(s) of support do you provide?

How many sites do you support currently for CME purposes using SO?

Who is your medical sponsor for this project? (supervising/mentoring physician? who trained you?)

Is respondent part of the Texas peer review network? What is periodicity of peer review sessions?

Any regular contact with similar programs in other states? If so, where/with whom?

Part of CJA's telemedicine task force?

Forms collected (for interview file):

Section 1: History with the Project

History with involvement in this project (how s/he got involved and why; etc.)

How much previous experience had you had with this kind of technology before you got involved in this project?

What does s/he think are/will/would be the benefits of participating in this project?

If program is OUT-OF-STATE: About his/her state's telemedical technology used to support child sexual abuse examination and prosecution process
Is there an organized project as there is in Texas (ex., Children's Justice Act) to increase prosecution of child abuse offenders? Who's the lead person/institution?

How have they funded their telemedicine project? (Ex., NTIA?, etc.)

How many institutions are part of your state's network? How is the network structured? (ex., hub/spoke; centralized service bureau, etc.?; referring vs. examination/consultation agencies/institutions, etc.)

At present, what part of the network is comprised of rural sites/institutions? (ex., how are rural sites configured/supported?)

Are you part of any <u>national</u> peer review network for child sexual abuse examinations?

Section 2: Current Setup/Operation

Population(s) served:

Where do his client referrals come from (CPS, ER, DA, PD, PARENTS, CAC, OTHER PHYSICIANS)?

Exam site's hours of operation/availability:

#Frequency of Examinations at your site (ex., 2-6/week?):
How much do these exams cost? How are they paid for?

#Frequency of Consultations that you provide (with or without SO) to other sites (ex., 1-3/month?). About how long does each consultation take?

Where are these <u>consult calls</u> that you receive coming from? (ex., rural sites? Urban? Other states? Who is in the 'network'?):

How often do you request a *Second Opinion* for your own work using *Second Opinion* to send the images to the consulting colleague?

Where are physical exams conducted?

What's your site's setup like where you do the physical examinations? *(Where are exams done; what's the technical configuration in the exam room, elsewhere? All component pieces/connections, etc. Should be able to draw a picture from this description. How is Second Opinion situated within the site?)*

What's your typical exam process like? What's the PROTOCOL? Who does what/when, etc? Typical scenario? Current examination team? (Their different roles?)

What works/doesn't work with this setup? What are the glitches, if any?

What about your recordkeeping process? Do you use any <u>special</u> data collection forms, etc? How are these stored? Is *Second Opinion* part of this? Does *Second Opinion* facilitate this or hinder it? Describe.

What unique/specific expenses are involved in your participation in the CJA project?

Current monthly modem costs (for transmitting images)?

Current monthly long-distance costs (for consults/peer review conferences)?

One time costs (ex., what were CJA funds used to purchase?):

Ongoing expenses:

Section 3: Technology Evaluation

At present, how many patients/images do you currently have archived in your SO datafile?

Installation and training: How much training is required to get a new staff person up to speed using *Second Opinion* software?

How long did it take you to set up and to learn how to use SO?

Do you usually leave SO in "unattended" mode during the day?
What about after hours?

How would you rate SO's difficulty level?

- Very easy to use
- Somewhat easy
- OK
- Somewhat difficult
- Very Difficult

How would you rate SO's software support?

- Excellent
- Very Good
- Good
- Not very good
- Not good at all/unsatisfactory

What do you think are the best uses for *Second Opinion* software?

- Medical findings exams
- Peer review
- CME
- reference
- resident training
- Other?

What have you discovered are the best features of SO?

What features of SO need enhancement? Have you encountered any particular problems?

How would you rate *Second Opinion* for your medical purposes (from a medical accuracy perspective)?

- Very accurate/reliable
- Somewhat accurate/reliable
- Neutral
- Not very accurate/reliable
- Not at all accurate or reliable

How would you rate *Second Opinion* for your peer review purposes?

- Very helpful/useful
- Somewhat helpful/useful
- Neutral
- Not very helpful/useful
- Not at all helpful/useful

How would you rate *Second Opinion* for your CME review purposes?

- Very helpful/useful
- Somewhat helpful/useful
- Neutral
- Not very helpful/useful
- Not at all helpful/useful

How would you assess the impact of the use of *Second Opinion*? In your state? Nationally?

How often are you asked to testify? Do you usually take images with you? Are images usually asked for?

How many of your images actually have been subpoenaed over the past 5 years?

What kind of data have been collected statewide about prosecutions, etc? Are you involved in contributing to that data pool? In what ways have the images created by SO assisted in this?

Section 4: Expansion Considerations

Is SO the best software produce to use to support the project's expansion?

How do you see your role long-term? Hub/Satellite/other?

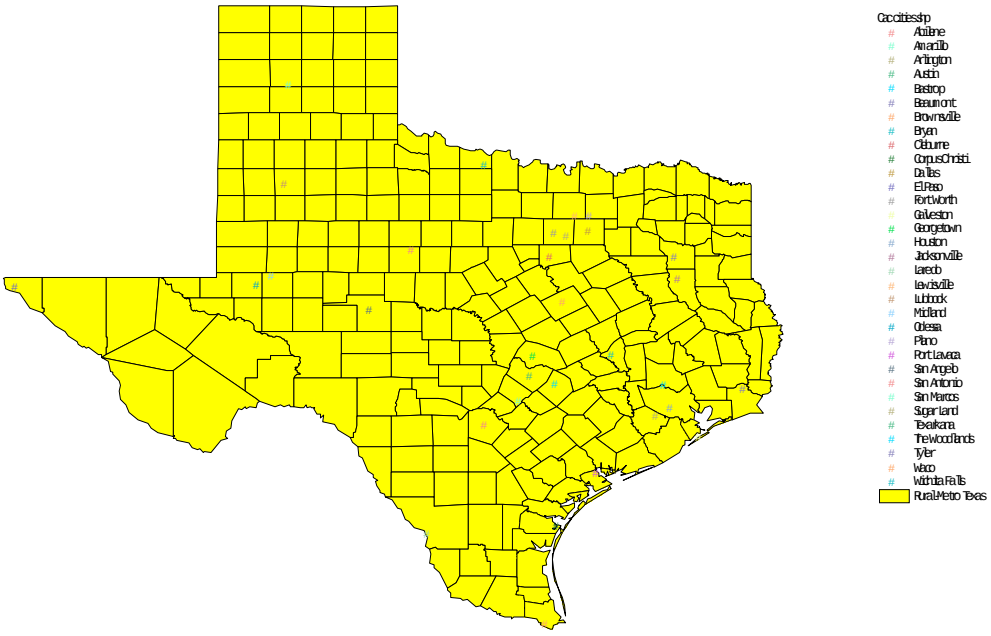
What kinds of additional requirements will come with expansion? (software, hardware, funding, staff, etc?)

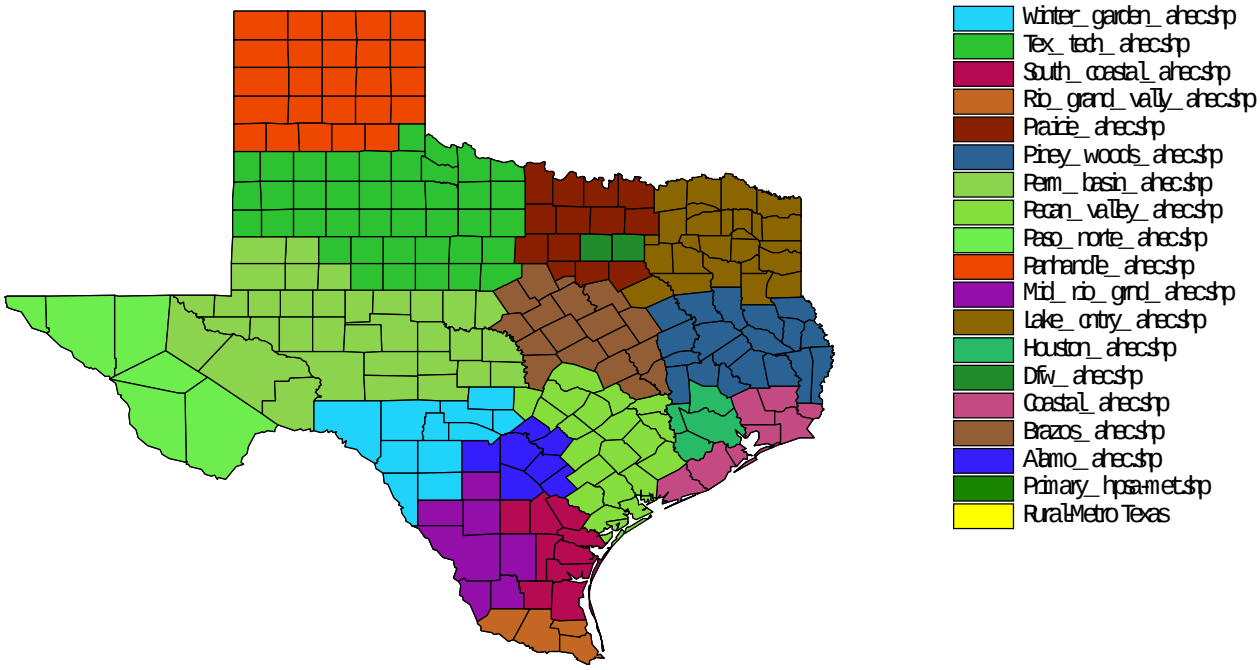
Are you aware of other telemedical networks in the state?. Do you have any working relationships with health professionals at these locations?

Are there any downsides to expansion? If so, what are they?

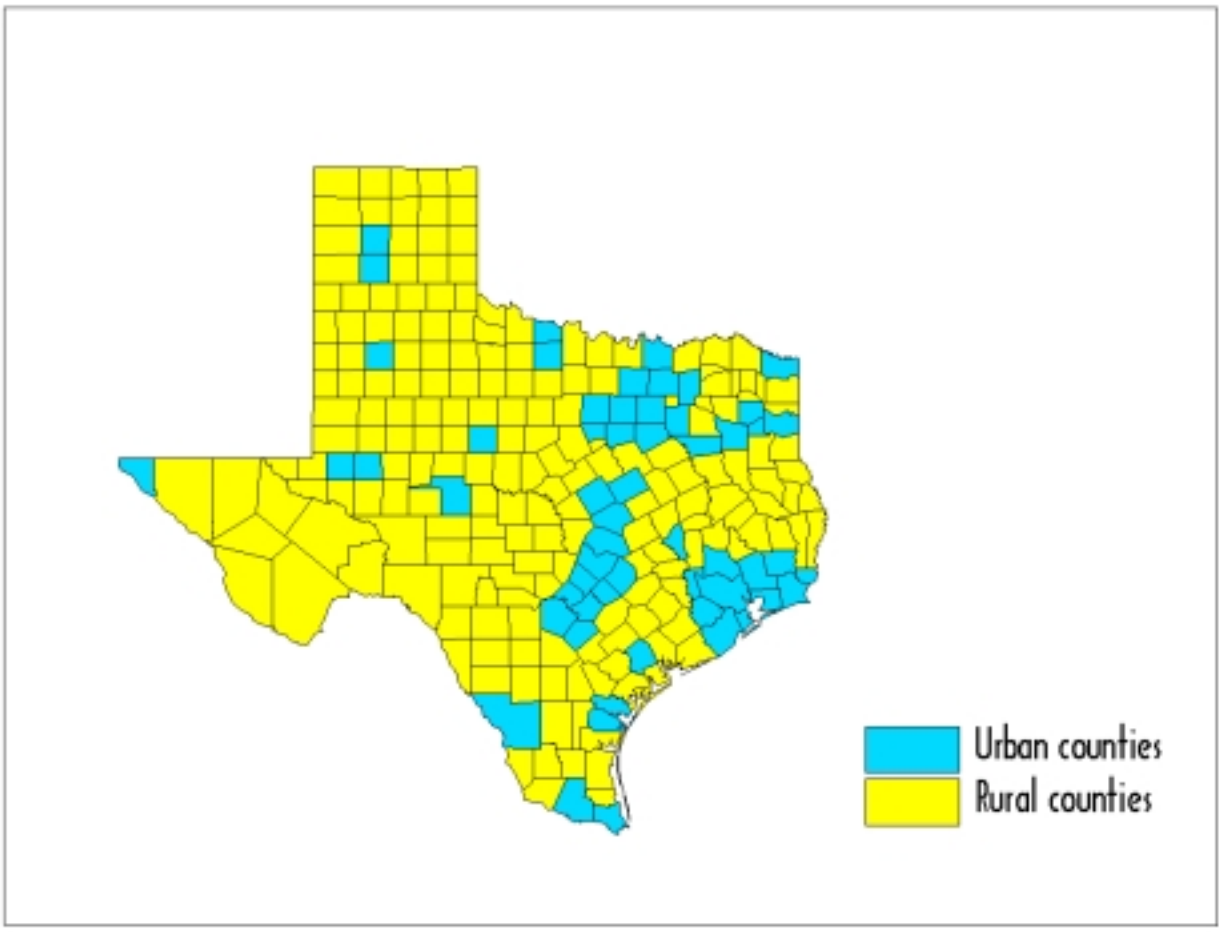
Section 5: Other Issues/Concerns To Consider?

Appendix D: Maps





Area Health Education Center Regions



Rural and Metro Texas Counties

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