Telepsychiatry: Critical Dimensions for Forensic Services

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The use of telepsychiatry technology and services has gained attention among legal and clinical practitioners. In the current article, telepsychiatry is defined, and an innovative model of telepsychiatry care delivery that is in use in a child and adolescent forensic evaluation clinic is examined. Critical factors specific to forensics services are examined, as are those specific to telepsychiatry, including transmission mode, privacy and confidentiality, expense, quality of care, face-to-face versus video transmission, user satisfaction, and liability concerns in the use of telepsychiatry.

The clinical practice of forensic psychiatry has led to applications for consultation that enhance the opportunity to reach underserved clients through telepsychiatry. Baker[1] and Whitten and Cook, among others,[2–5] have addressed the use of telemedicine applications with children. Through this medium, clients in need of specialized care that might not readily be available to them can have the specialty consultation of experts. Our purpose in this article is to provide a model of this emerging forensic service and highlight the use of psychiatric telepsychiatry services as a vehicle for improving access to needed consultation for clients with legal concerns who are in need of mental health and health care services.

Defining Telepsychiatry

Telepsychiatry is an evolving concept based on models of telemedicine. It is conceptualized as a practice of health care delivery that can include diagnosis, consultation, treatment, and transfer or exchange of medical and other data and educational materials through interactive audio, visual, and data communication.[6] While elements of telepsychiatry have been used in medical diagnosis, patient care, and professional education for more than 30 years in the United States, interest surged when digital-imaging technology became widely available, costs of transmission and equipment were reduced, and some reimbursement barriers were eliminated.

In 1991, there were four telemedicine networks in the United States. About five years later, there were approximately 160. In 1994, there were 2,083 teleconsultations; in 1998, more than 52,000. Video consultations increased from 1,750 in 1993 to 18,766 in 1996.[6] The most active specialties for teleconsultation have been psychiatry (17.9%), cardiology (16.7%), ophthalmology (9.6%), and orthopedics (5.7%). The costs of the hardware, software, and signal transmission were high in the beginning, but have dropped dramatically. In 1992, interactive video equipment cost more than $100,000; in 2000, the same equipment could be purchased for less than $20,000.[7] Today the use of videotelephones costs less than $500.00 and existing telephone lines can be used.

Delivery of telemedicine services has been considered a partial solution to the problems of accessing health care in remote areas and in areas underserved by health care professionals. Various projects have demonstrated a wide variety of clinical tasks that can be accomplished successfully by a telemedicine network comprising interactive television and voice communication systems. The need for such systems

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Table 1 Trends in Forensic Consultation

	Past Trends	Contemporary Trends
Administrative paradigms	Forensic referral to medical centers, independent clinical practices, and independent providers	Forensic clinics establish partnerships, networks, and alliances, contracting through an integrated services delivery system of service providers
Clinical models	Provider-focused: clinicians are individual providers/specialists who provide services on an independent basis to courts and lawyers.	Patient-focused: clinician and team of providers and specialists provide services to courts and judicial systems.
Information models	Paper clinical records; provider-developed record systems; local accessibility in the courts to records	Interactive television consultation; electronic health records; on-line support systems; e-mail, electronic files, and information exchange for comprehensive and integrated clinical care

is obvious in the face of the major obstacles clinicians face in providing a high standard of health care delivery in a time-efficient and cost-effective manner.[8–10]

Clinicians and forensic specialists are experiencing several paradigmatic changes in administrative, clinical, and information systems and interventional models. Some of the emerging trends in each of these categories are summarized in Table 1. Most notable among these changes are the multiple uses of telepsychiatry in criminal justice and clinical models of health care delivery.

A Telepsychiatry Forensic Model

The Child and Adolescent Forensic Clinic located in the Child Psychiatry Outpatient Clinic, Department of Psychiatry, University of Kentucky Medical Center, University of Kentucky, Lexington, Kentucky, is the model presented. Child psychiatrists, clinical social workers, clinical psychologists, and child psychiatry residents work cooperatively in assessing and treating forensic patients referred to the clinic. Generally, at least two or three disciplines participate in all evaluations. The multidisciplinary component allows the opportunity to offer a variety of psychotherapeutic approaches, including interpersonal therapies, individual therapies, psychological testing, and a range of medical interventions that include hospitalization, residential treatment, medication management, and medical evaluation.

The clinic provides a Child and Adolescent Forensic Clinic Seminar via telepsychiatry technology to multiple hospital and training sites across the state. The seminar is held two hours per month and focuses on a wide variety of topics, including evaluation strategies, treatment approaches, courtroom testimony, child competency, court-ordered evaluation

in sexual abuse cases, child litigation, fire-setter cases, and dangerousness assessments.

The telepsychiatry forensic clinic provides clinical consultation through the Telecare Network to mental health practitioners throughout the state. The interactive television model is used for case consultation weekly, for mental health practitioners to present cases to or request consults from forensic clinic faculty. Rural clinicians throughout the state can schedule a video link consultation with a specialist in forensics from the university site. The clinic provides access to nearly all the counties in the state but primarily focuses on 60 counties in the southern, northern, and eastern regions. The types of agencies involved with the university-based forensic telepsychiatry clinic include community mental health centers, the state Department of Social Services, and several schools.

Interactive teleconferencing has also been useful in courtroom testimony, making it possible for mental health practitioners to testify in courts too remote for travel to be feasible. Telepsychiatry can be applied when giving depositions or when providing actual testimony in the court and direct consultation with the attorney.

Figure 1 summarizes the model for using clinic-based telepsychiatry technology in serving forensic populations. Clients with special needs in rural settings are seen in their community setting through the rural clinic and, in the case of children, through the school system. When there is a need for psychiatric consultation services from a tertiary-care medical center clinic, a telecare link to the primary care clinic, regional hospital, or rural school clinic through the telemedicine network is established. In an Internet-based model, clinical records can be shared electronically with consulting clinicians, providing them
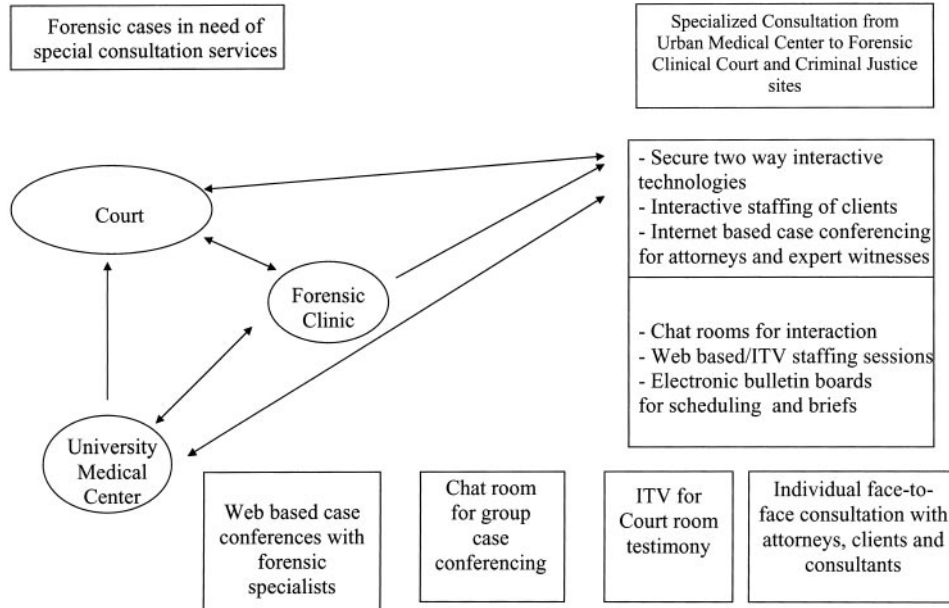
Figure 1. Forensic consultation through telepsychiatry technology.

with an opportunity to review information individually and to respond to relevant clinical matters.

Specialty clinics in the Department of Psychiatry at University of Kentucky Chandler Medical Center utilize the Kentucky TeleCare Network, which includes a telecommunications high-bandwidth (T-1) link between the medical campus and an offsite Department of Psychiatry. Kentucky TeleCare Network sites can also link to other telemedicine network sites by connecting with network hubs, including the St. Claire TeleCare Network, the Appalachian Regional Healthcare Network, and the Eastern State Mental Health Network. Future plans include the linking of developing telemedicine sites in western Kentucky through connections to the University of Louisville telemedicine hub.

The telepsychiatry forensic clinic has been functioning for five years, with case consultations conducted on 30 to 50 cases per year. The clinic continues to evaluate forensic cases via telepsychiatry video teleconferencing when appropriate.

Critical Problems With Telepsychiatry Technology

Despite certain advantages, telepsychiatry is subject to many of the same shortcomings associated with face-to-face care as well as several technology-specific limitations. As with face-to-face care, telepsychiatry may not allow individuals to get what they need from the clinical process. Beyond these generic concerns are several challenges that occur as a result of introducing telemedicine technology through forensic services.

Transmission Mode

Telemedicine technology involves a spectrum of interactive video transmission modes. Currently, transmission is provided in the analog or digital modes. The analog mode, transmitted in the form of waves, uses the technology of broadcast television on the high end of the scale and the regular telephone line on the lower end of the scale. Among its advantages are the transmission of high-resolution video images via high-bandwidth capacities, such as satellite, microwave, and T-1, or slower-speed video and still images via the low-bandwidth capacities of a phone or fax line. Disadvantages of interactive video transmission include the lack of industry standards; the expense associated with transmission; and the difficulties encountered in the different transmission modes, from the complexity of the hardware in high-bandwidth transmission rates to the jerky video or delayed audio at the lowest-bandwidth rates.

The working components of interactive video transmission include image and data capturing and transmission. Critical in this transformation is the coder-decoder (CODEC). This equipment transforms the analog signal to digital at one end of the network and back to analog at the other end. To

transmit live video images, a video camera is needed at each site. It is augmented by microphone to pick up speech and other audible information so that those on each end can see and hear what is being sent to each site by the other.

The digital mode takes advantage of developments in computer science, and transmits in the form of a digital byte-stream of zeros and ones. Its advantages are lower transmission costs, reduced equipment size, simplicity of operation for those who are computer literate, easy interface with computers and computerized systems, and nondegradation of the video image. Some relative disadvantages of the digital system include the lack of industry standards, the echoes of motion that appear at slow transmission speeds, large image file sizes that could incapacitate a network, access to technology, and privacy and confidentiality issues.[11] Most recently, evolution in computer equipment and accessories, compression algorithms, and easier access to higher levels of bandwidth to the home or office, have made the personal computer, equipped with camera and microphone, the communications tool of choice for busy practitioners who can provide e-health consultations via Internet protocol (IP).

Privacy and Confidentiality

In an electronically mediated environment, concerns regarding confidentiality may take on new dimensions. According to Stamm *et al.*[12] security risks fall into two basic categories: (1) risks directly from people and (2) risks from technology. Risks from people may come in the form of criminal and malevolent intent or accident or curiosity. One of the most serious risks is unauthorized access to confidential information.[13] Fortunately, these risks may be reduced by utilizing secure or closed networks and encryption programs and by adhering to the standards set forth in the Health Insurance Portability and Accountability Act (HIPAA), which provides national standards to reduce health care inefficiencies by encouraging the use of information technology to secure and protect patient information. Within the context of telemedicine and telepsychiatry, any discussion of health-related information through the supervisory process must be disclosed to patients with the assurance that their privacy will be protected.[14] Under HIPAA, and as a part of the informed-consent process, patients should be advised of uses and disclosures of health information, including health care operations that involve quality assessment, evaluating practitioner and provider performance, conducting training programs, and providing clinical supervision.

In addition to risks that come directly from people, there are technological risks that originate from software or computer systems. For example, computer viruses may be designed to destroy data or disrupt computer systems. To avoid these dangers, system managers must continually update their virus scan programs, be alert for system glitches, and work to ensure compatibility of all system components.[15,16] Another area of possible concern is the use of "bridge services" to connect multiple sites. Some networks may purchase a bridge service through contracting with a systems integrator or national telephone company. Companies that provide bridge services have access to and can record network activity. Practitioners can require the supplier to sign a written agreement demonstrating their efforts to protect confidentiality.

Costs of Equipment and Technology

In programs seeking to implement a system of telepsychiatry, the cost of acquiring and maintaining the necessary technology may also be of concern. There are numerous options for creating virtual connections. The use of the Internet, e-mail, and chat rooms may serve as an alternate medium of communication. Data can be sent on secure, closed "intranets" or encrypted to ensure confidentiality.[17] Equipment needs are minimal, with only a computer and Internet access needed at each location.

Face-to-Face Versus Video Transmission

In technology-mediated, face-to-face contact, several types of videoconferencing applications exist. The quality of these units can be measured in frames per second (fps). Broadcast quality is usually 30 fps, but fairly clear resolution can be achieved at speeds of 15 to 20 fps. As fps increases, so does the quality of the transmission, but the cost of the system increases as well. When selecting a videoconferencing application, it is important to consider the clinical demands on the system. In psychiatric consultation, if detecting fine motor movements is critical, then a system with higher fps may be important. Slower frames might be more appropriate when movement is not an important factor or when the cost of higher frame rates is prohibitive.

In this latter case, two relatively inexpensive videoconferencing options include the use of videophones and desktop computer systems. Videophones that are H.324-compatible units, also referred to as POTS (plain old telephone service), transmit data at up to 15 fps across analog phone lines. Stand-alone units typically feature a built-in handset and LCD (liquid crystal display) screen, whereas set-top videophones (which resemble a small cable box) utilize existing televisions and telephones to transmit data. Because these units can operate on analog phone lines, they may be ideal for areas without access to digital phone lines. Desktop videoconferencing systems involve the use of a personal computer equipped with a camera, microphone, and videoconferencing software.[15]

Internet Computer Models Versus Videoconferencing

Internet-based computer models are less expensive and vary from 30 to 15 fps, depending on Internet traffic and computer processing speed. Sites that require broadcast quality transmission may incorporate either a set-top or integrated videoconferencing system. Set-top systems are designed to sit atop a dual or single monitor and can be maintained on a mobile station, making it possible to move the system to different locations as necessary. These systems deliver high-quality, real-time audio/video data and work well with auxiliary equipment (e.g., document cameras). Integrated videoconferencing systems are used for group conferencing, most often in conference rooms or classrooms designed to accommodate multiple participants. These applications usually consist of a centralized location for wiring and processors. The main camera, displays, and peripheral video sources are usually mounted in the main conference area. Integrated systems may be customized and equipped with multiple features allowing them to be used for a variety of functions. Given the rapid pace of advances in technology, prices for the equipment vary from a few hundred to several thousand dollars. Fortunately, federal programs such as the Universal Service Program for Rural Health Providers may help to defray the operating costs of telepsychiatry systems by providing partial reimbursement for methods of connectivity for health care consultation, health data transfer, and Internet access.

User Satisfaction

Regardless of the specific type of technology implemented, the success of a telepsychiatry system most often hinges on its acceptance among participants. Although early studies of telepsychiatry applications have typically demonstrated significant rates of satisfaction among both clients and providers, findings in several studies have suggested that, when compared with face-to-face communication, clinical service providers may be more anxious during technology-mediated contacts.[18] Such anxiety may be attributed to several factors, including lack of experience with technology or poor understanding of how telecommunication equipment works. Training may serve to increase acceptance among patients and clinicians. Telepsychiatry training can provide staff with a working knowledge of the physical features and functioning of the system, to allow them to use the technology with relative ease and to train users in appropriate and inappropriate uses of telepsychiatry services. These suggestions could also help in risk management and reducing the potential for liability.

Liability in the Use of Telepsychiatry

Liability for practitioners and agencies in the use of this new technology involves two potential problems that providers must recognize and address in the provision of clinical services: negligence and abandonment. Practitioners must be cognizant of the risk of liability for negligence whenever they provide services to patients via telepsychiatry technology. A "reasonable care" standard is still applicable, despite the limitations of the telepsychiatry methodology.

Liability may be incurred when practitioners, primary caregivers, and/or patients do not thoroughly understand the operation of the telepsychiatry equipment. For example, assurance must be given regarding the provision of services should the equipment fail. In such a situation, will the services still be provided in a reasonable and acceptable way for both the patient and the practitioner? There are some practical strategies that agencies can use to manage risks of liability for abandonment in the event of equipment malfunctions and/or failure. These include an evaluation on admission as to whether patients can care for themselves in the event of equipment malfunction or failure. What are the risks to the patient if the equipment malfunctions? What steps should the patient take when the equipment is malfunctioning? Admissions agreements or letters can document these re-

sponsibilities. Patients should be asked to sign these documents to confirm their understanding of their responsibilities.

Quality of Care

To date, the quality of telepsychiatry care has been examined in relatively few studies. In an attempt to assess consultation via videoconferencing qualitatively, Gammon and colleagues[19] compared five videoconferencing supervision sessions to five face-to-face sessions. In this investigation, hospital-based supervisors utilized videoconferencing equipment to conduct individual supervision sessions with six psychiatry residents. Following the completion of 10 sessions (alternating videoconferencing with face-to-face contact) participants were interviewed. The authors reported that the quality of supervision was satisfactorily maintained by using videoconferencing for half of the required supervision hours with the precondition that supervisor-supervisee pairs initially met face-to-face to establish a working relationship. While subjective accounts such as this one are encouraging, there remains a lack of quantitative outcome-based data on the use of telecommunications technology for clinical care.[20]

Scope of Practice and Licensure

The question of licensure requirements, as a limitation to interstate telemedicine practice, is often cited as a major barrier to the development of telemedicine networks and services, including telepsychiatry services. As with most health care professionals, telecare providers are licensed on a state-by-state basis, which requires that a practitioner hold a full, unrestricted license in all states in which he or she practices. For many professionals, acquiring and maintaining multiple licenses is a significant professional and financial burden that falls particularly hard on rural health care providers who often experience significant travel, lost work time, and other costs in complying with multiple state regulations. The primary issue for interstate psychiatric consultation is whether they "enter" State B from State A and "practice" a regulated profession via a telecommunications link.[15] Given that individual states differ in their definitions of practice, it is important that practitioners review the state's regulations to determine whether or not telepsychiatry is considered to be part of professional practice. In some cases telepsychiatry activity may be covered under "consultation" services

and therefore might be time-limited or exempt from licensure. Regardless of the status of interstate practitioners, it is important to remember that the direct and immediate delivery of patient care is always the responsibility of the on-site licensed professional.

Critical Questions in Forensic Telepsychiatry

Several questions have emerged in considering the application of telepsychiatry specifically to the forensic arena. How should appropriate cases be selected? How does examination of witnesses occur? How do judges respond to the use of telepsychiatry technology? What are the strengths and limitations of the technology?

The child psychiatry forensic clinic has had experience with civil cases accepted by the court for testimony using interactive TV. The decision to allow interactive TV instead of direct testimony in the courtroom was the decision of the presiding judge, who reported a positive response to the experience.

In the cases using telepsychiatry technology to date, clinicians were court witnesses. Both attorneys involved agreed to the use of telepsychiatry technology. From this perspective, no major inconveniences were encountered. There is sometimes a delay of a second or two in receiving the response of the testifier, but one can accommodate that from both the sender's and receiver's perspectives. The savings of time, travel, and money are regarded as positive outcomes. The disadvantages observed involve the realization that witnesses may not directly see the judge or the jury. The system is voice activated and therefore the person on the other end can see only the person talking, usually the attorney, but not the judge or the jury.

There may be objections because the attorneys cannot control who else might be in the room when the witnesses testify, and the attorneys cannot control the material the witness has in his/her possession except through witness cooperation. Some attorneys have expressed concern about the potential for "coaching" of the witnesses. This could be resolved by having persons serving as court-ordered monitors in remote sites to assure the court that no coaching takes place. To date, no problems in cross-examination have occurred with the use of telepsychiatry technology, but we can see the possibility of objections. Efforts to study judge, witness, and attorney

satisfaction with the use of this technology are in the pilot stage at this point.

Conclusions

Telepsychiatry services provided through a forensic clinic offer a contemporary method of giving standardized and universal coverage to clients in need of such services by linking the forensic clinic, the courts, and health care providers in their efforts to supply more effective and efficient services to the judicial system. As an alternative way of providing traditional services, telepsychiatry technology is considered by some to be a solution to America's toughest health-related challenges, including increasing access to psychiatric services involving health care experts, while decreasing the costs involved in providing quality care.[17] The future of telepsychiatry in providing psychiatric consultation involves a spectrum of questions and problems, including confidentiality and professional licensure.[21] The day may come when telepsychiatry technology is put to a variety of uses, but all decisions about such interventions must be informed decisions made by the consumer. Those in the fields of psychology, psychiatry, and social work must resolve the complex problems confronting the provision of health care through telemedicine.[22] Practitioners and researchers must encourage policy makers to account for the special needs regarding the use of behavioral health records and services when developing national health information policy.

Likewise, examining standards of care becomes critically important, and the matter of setting standards for telemedicine is complex. Policy makers who are seeking to protect consumers while responding to the marketplace's demand for clinically appropriate and cost-effective telemedicine interventions are beginning to clamor for both clinical and technological standards.[23]

The need for evidence-based standards of care will continue and the health care professions are likely to be called on to develop practice guidelines for their clinical telemedicine providers. If these guidelines are not developed, professionals using telepsychiatry risk having the government, or perhaps another monitoring group, develop the standards to which they would be required to adhere.

The impact of cost on the provision of standard-based clinical services must be evaluated through clinical research and outcome studies, to assess the effectiveness of the use of telemedicine in the provision of such clinical services.[24] Within the model and the limitations noted, telepsychiatry and its applicability to forensic services provide new avenues for delivery of clinical and consultation services to the courts, correctional systems, and legal profession for underserved populations in need of forensic psychiatric expertise.

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