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Article 28

Requisite Computer Technologies and Infrastructures for Providing Live, Remote, Clinical Cybersupervision

Paper based on a program presented at the 2007 Association for Counselor Education and Supervision Conference, October 11-14, Columbus, Ohio.

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Introduction

The meteoric rise of computer technologies and infrastructures during the past three decades now makes it possible to deliver live, clinical supervision from virtually any place on Earth. This capability is, of course, no small accomplishment and stands as a crowning achievement in a long history of technology use to deliver clinical supervision. Since the 1950s, counselor educators have slowly but consistently adapted emerging technologies to enhance the quality of supervision. During that decade, telephones were used to provide supervisory feedback during live counseling sessions. Although intrusive, this technology has stood the test of time in supervision practice with only minor modifications to the hardware employed (e.g., cell phones, digital telephones with text/video messaging). Advances in audio technologies gave rise to the use of audiocassette recorders and “bug-in-the ear” devices for supervision. Other improvements in video technologies prompted the widespread use of video cameras and videocassette recorders to tape counseling sessions for post-session reviews as a component of clinical

supervision. However, it has been the upsurge in digital technologies that now enables clinical supervisors to not only view counseling sessions from remote locations in “real time,” but also to provide “live” evaluative feedback both during and after counseling sessions.

Live, remote clinical supervision, a form of cybersupervision (Miller & Miller, 2008), is a constellation of processes by which counselor supervisors provide real-time evaluative feedback to supervisees who are delivering counseling services in another (i.e., remote) location. In these processes, a supervisor uses her computer and a broadband Internet connection to access a digital video camera, microphone, and computer monitor housed in a remote counseling room. With a full view of the supervisee and client(s) and access to verbal communications through her computer monitor and speakers, the supervisor observes the counseling session and provides evaluative feedback during or after the session, or both. Depending on location, type of supervision process desired, hardware and software configurations, and the speed, reliability, and security of the Internet connection, feedback can be delivered in several formats. Figure 1 depicts a common hardware configuration for delivery of cybersupervision from an observation room (e.g., located in a counseling clinic) to a supervisee who is providing counseling in one of the clinic’s counseling rooms.

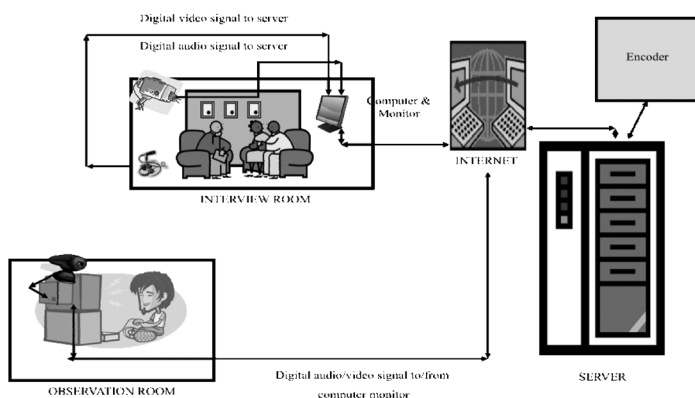


Figure 1. Common Hardware Configuration for Delivery of Live, Remote Cybersupervision to a Single Supervisee in a Training Clinic.

System Feasibility

Live, remote clinical supervision is technically feasible using current equipment and video protocols. The authors conducted a pilot project using notebook computers and Polycom® cameras and software over a broadband wireless network to simulate supervision of a mock counseling session. Although audio and video qualities are subjective factors, participants were able to communicate clearly with good video quality. Videoconferencing equipment has been successfully utilized for conducting live, remote, clinical supervision (Miller, Miller, & Evans, 2002). This equipment is similar to that used in telemedicine (Mora, Cone, Rodas, & Merrell, 2006) and distance education (Trauner & Yafchak, 2005) applications. A number of companies offer hardware, software, and services that can be adapted for the delivery of live, remote cybersupervision.

System Requirements and Costs

Technologies that support the delivery of cybersupervision have expanded at explosive rates and include high-speed computer chips, mass-storage devices, broadband Internet access, instant messaging programs, wireless technologies, and videoconference software. In order to implement a system that supports live, remote supervision, the supervisor (minimally) and both supervisor and supervisee (in order to maximize options) must have access to computers equipped with the hardware and software options identified previously. It is important to note that many notebook and desktop computers sold today in the United States are equipped to support most forms of live cybersupervision as part of an overall videoconferencing system. Specifications for each computer system must be selected to meet the hardware (e.g., type of video camera) and software (e.g., videoconferencing program) requirements of the videoconferencing system.

In addition to the computer requirements identified above, consideration must also be given to hardware/software requirements

in the counseling room, counseling center, and at the university. The counseling room must be equipped with a digital camera accessible by a wireless signal, a digital microphone, and (in some methods described below) a stand-alone, flat-screen monitor that can be wall mounted. Figure 2 illustrates a common hardware configuration for live, remote cybersupervision of multiple sessions within a training clinic.

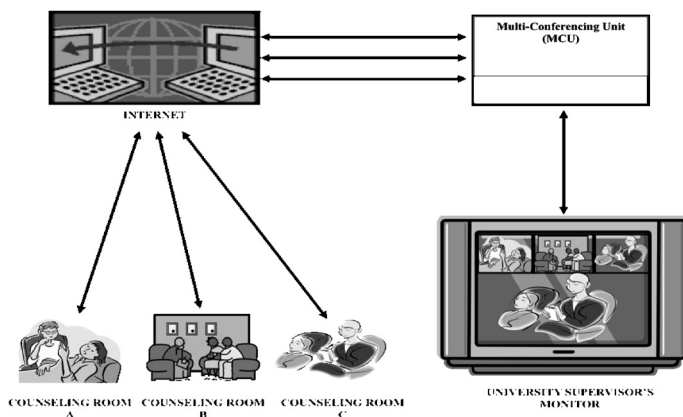


Figure 2. Common Hardware Configuration for Delivery of Live, Remote Cybersupervision to Multiple Supervisees in a Training Clinic.

Initial set-up costs vary considerably depending on existing equipment and infrastructure and desired capability. The actual costs of implementing a wireless videoconferencing system will also depend on the number of remote sites connected. The information that follows was obtained through discussion with technical personnel (J. Brandenstein, personal communication, October 2008; J. Paolucci, personal communication, September 2007) to identify key components and approximate costs of a videoconferencing system.

- Multi-conferencing Unit (MCU; Optional), \$50,000-\$100,000. More cost-effective options include foregoing the MCU and registering CODECS with videoconferencing services to provide conferencing to multiple sites at a cost of approximately \$150/month/CODEC.
- Encoder-Decoder (CODEC), \$10,000-\$15,000. One per counseling session room to be monitored. Some onboard options

may decrease other costs. For example, some onboard CODEC options may facilitate multi-site calling.

- Digital cameras, \$1,000. One per counseling session room. Less expensive portable cameras for each supervisor's computer will be necessary if not "built in."
- Personal Computers (notebook or desktop), \$1,000. One per supervisor – optional for each counselor station depending on capabilities desired. Video displays (\$500) are needed at each counselor station as a minimum.
- Headsets, \$30. One per supervisor.
- Bandwidth (T1 example), \$25/month/per 1MB.
- Video Encoder (PC System), \$2500.
- Server Storage, \$3,000-\$10,000.

Components necessary for wireless Internet access may add to the cost of the system if such access is not already in place and a wireless connection is desired. The costs for wireless components are not provided because they are highly variable depending on the physical characteristics of the area and distances from the counseling site to the receiver.

The authors advise consulting with institutional technical experts and with representatives from common commercial vendors such as AT&T, Life Size, Polycom, RADVision, Tanberg, and Trinity Global L.L.C. These vendors are a small sample of companies that supply such equipment and services.

Supervision Options

Depending on technological capabilities and the supervisor's preference for providing live evaluative feedback during or after counseling sessions, a variety of live, remote supervision options are available. Bug-in-the-Eye (BITE) supervision is an adaptation of an approach described by Neukrug (1991) and more recently implemented by Miller et al. (2002). BITE supervision requires that the counseling room be equipped with a digital camera and microphone, as well as a computer monitor that is mounted either

behind the client(s) or on a swiveling wall mount and positioned so that only the counselor can view the screen. As the supervisor remotely views the counseling session from her computer, she uses an instant messaging program to provide immediate feedback on the supervisee's performance. Appearing as either text or iconographic messages (see Figure 3) that are digitally transmitted by the supervisor onto the monitor in the counseling room, the supervisor looks for evidence that the supervisee has read the message, then uses a combination of keystrokes on her computer to withdraw the message in preparation for the next.

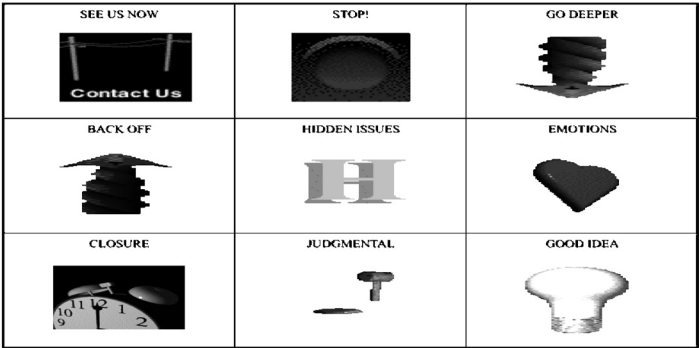


Figure 3. Examples of Iconographic Messages Used in BITE Supervision. Source: Miller, Miller, & Evans, 2002. Copyright 2002 by the American Counseling Association. Reprinted with permission. No further reproduction authorized without written permission of the American Counseling Association.

Audio-Track Overlay Protocol (ATOP; Evans, Miller, Miller, & Lucey, 2005) is a process that enables supervisors to provide comprehensive audio feedback in real time during counseling sessions for post-session review by supervisees. In this process, a supervisor remotely observes the counseling session from her computer (as described above) and uses a digital microphone to record substantive feedback regarding the supervisee's performance at specific points during the session. The supervisor's comments are synchronously recorded as a digital audio file with the digital video file of the session, which are saved to a server. Because the audio signals are recorded in

real time as the session progresses, supervisees are able to play back the video digital file of the session and hear the supervisor's evaluative feedback at junctures that correspond to communications that occurred during the session.

Perhaps the most comprehensive option for delivering live, remote, clinical supervision is through post-session videoconferences. This method requires that both the supervisor's computer and the one located in the counseling room be equipped with digital video cameras, microphones and speakers, broadband Internet access, and videoconferencing software. In this approach, supervisors observe the live counseling session from a remote location as described previously and use any number of live supervision options previously noted. Following the session, the supervisor opens a live videoconference with the supervisee in order to provide evaluative feedback. During this process she may examine portions of the counseling session that are retrieved from the server and viewed on both computers, review supervisor feedback saved in ATOP files, or discuss a host of other supervision issues.

Benefits and Limitations

Several benefits can be realized from the use of live, remote, clinical supervision. These include time, cost, convenience, and efficacy advantages. Time is an important resource and remote supervision offers opportunities to conserve time by eliminating travel to counseling sites. Live, remote supervision is economical: saving mileage, tolls, parking fees, and other travel expenses. In situations where the supervisor visits multiple sites, savings are magnified. Live, remote, clinical supervision is convenient. Imagine the ease of supervising from the office; no driving, parking, packing a lunch, and so forth. Taken together, these advantages yield increased efficiency in the delivery of clinical supervision.

Live, remote supervision allows supervisees in remote locations and rural environments access to a greater pool of professional talent. Because qualified supervisors are in demand, they

can provide more supervision services to larger numbers of supervisees. Live, remote supervision also permits counselor supervisors to observe sessions that are not practical to visit in person due to cost or travel limitations. Figure 4 illustrates a common hardware configuration for delivery of live, remote cybersupervision from an off-campus site (hotel) to an agency site.

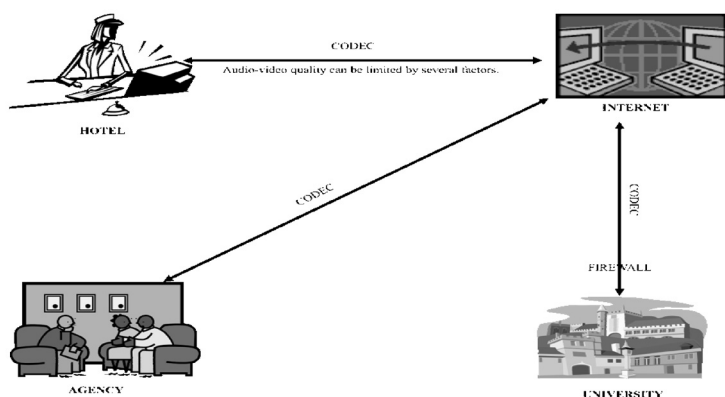


Figure 4. Common Hardware Configuration for Delivery of Cybersupervision From an Off-Campus Site to an Agency Site.

An advantage of digital audio and video communications, an element of live, remote cybersupervision, is the ease of archiving and retrieving digitally recorded counseling sessions for review in supervision sessions. Counseling sessions that are monitored via a videoconferencing system can be saved to a hard disk or other media storage system. Compared to analog systems (e.g., videotape), digital storage (i.e., files saved to a server) permits more precise retrieval of files and file segments, which can be indexed by date, time, or digital counter.

Despite the advantages of live, remote cybersupervision, supervisors must consider a host of potential technical, legal/ethical, and interpersonal limitations before adopting its use. These limitations include potential breeches of confidentiality through unauthorized access to live counseling or supervision sessions, constraints on the development of the supervisor-supervisee relationship, and lack of

research on the use of theoretical models in online environments. Although authors address technical issues in the following paragraphs, other limitations are addressed in the professional literature (e.g., Kanz, 2001; Layne & Hohenshil, 2005; Mallen, Vogel, & Rochlen, 2005; Miller & Miller, 2008; Wegge, 2006).

A major technical concern results from insufficient bandwidth and varying traffic through available bandwidth. Insufficient bandwidth can result in problems such as pixelization and freezing of the video and audio transmission during live supervision sessions. Insuring sufficient bandwidth dedicated to the videoconference is the best way to avoid or minimize these problems. This problem may be more likely to occur in off-campus settings (e.g., hotel) and while using wireless mobile computing where the background traffic, location, and other unpredictable factors may cause fluctuations in the transport channel (Liu & Zarki, 2006).

Even with dedicated bandwidth and ideal configurations, live, remote digital communications are characterized by a slight but perceivable delay as audio and video signals are transmitted. In order to address this problem, practice (plus patience) on the parts of supervisor and supervisee are critical. If not addressed, videoconference participants may inadvertently “talk over” one another. Depending on the speed of the video transmission, video may blur at high rates of movement. Avoiding sudden movements of the head, limbs, or body can reduce this problem. Background noise can be a problem if multiple sites are connected and those not involved in the conversation fail to mute their microphones. Training on how to operate the conferencing equipment, including when to open or mute the microphone, is necessary for all parties involved in the videoconference.

Guidelines for Use

Supervisor and supervisee training in the use of online and conference technologies is a simple solution to many of the aforementioned technical issues. The necessity of such training is

addressed in *Technical Competencies for Counselor Education Students: Recommended Guidelines for Program Development* (http://ehe.osu.edu/paes/couned/technical_competencies.htm) published by the Association for Counselor Education and Supervision (ACES). One implication of these guidelines is the need for counselor education programs to provide direct technology training, increase the frequency of technology-based assignments, and ensure that graduates can communicate effectively (Alleman, 2002). A lack of program responsiveness does not absolve counseling students from the responsibility to acquire technical competencies (Mallen et al., 2005).

Supervisors who opt to deliver live, remote supervision over wired or wireless systems must be familiar with the operation of the computer system they are using and with the procedures used to connect and participate in a videoconference. They must know protocols for providing a user ID and password to access the videoconference or the network. They must further be able to establish connections to the camera/microphone in the counseling room and to focus the camera (if this option is available). Supervisors must also know and use videoconferencing etiquette (e.g., communicating in a personable manner, allowing adequate time for others to finish speaking).

Insuring the security of audio/video transmissions is a critical consideration. Authors recommend consulting with information technology specialists and commercial vendors to identify a system that provides the use of firewalls and encryption software to protect sessions from unauthorized access. Using videoconferencing equipment and software from the same vendor may ensure compliance with HIPPA requirements (J. Paolucci, personal communication, September 2007; Williams, Ellis, Middleton, & Kobak, 2007).

Conclusion

Live, remote cybersupervision is a technological marvel whose emergence holds enormous promise for the counseling

profession. Advantages of this approach appear to outweigh limitations, which can be addressed through education, policy, and practice. Live, remote cybersupervision has the potential to enhance the quality, quantity, and effectiveness of supervision while making it more accessible and efficient with reduced expenditures of time, money, and resources.

References

- Alleman, J. R. (2002). Online counseling: The Internet and mental health treatment. *Psychotherapy: Theory/Research/Practice/Training*, 39, 199-209.
- Evans, W., Miller, K. L., & Miller, S. M., & Lucey, C. (2005, October). *Enhancing live clinical supervision through the use of audio*. Poster session made at the National Association of Counseling Educators and Supervisors: Pittsburgh, PA.
- Kanz, J. E. (2001). Clinical-supervision.com: Issues in the provision of online supervision. *Professional Psychology: Research and Practice*, 32, 415-420.
- Layne, C., M., & Hohenshil, T. H. (2005). High tech counseling: Revisited. *Journal of Counseling & Development*, 83, 222-226.
- Liu, H., & Zarki, M. E. (2006). An adaptive delay and synchronization control scheme for Wi-Fi audio/video conferencing. *Wireless Networks*, 12, 511-522. DOI archived at <http://dx.doi.org/10.1007/s11276-006-6549-7>
- Mallen, M. J., Vogel, D. L., & Rochlen, A. B. (2005). The practical aspects of online counseling: Ethics, training, technology, and competency. *The Counseling Psychologist*, 35, 776 -718.
- Miller, K. L., & Miller, S. M. (2008). An integrated instructional and clinical model for intranet and internet live supervision. In S. P. Ferris & R. Zheng, (Eds.), *Online instructional modeling: Theories and practice* (pp. 223-241). Hershey, PA: Idea Group, Inc.
- Miller, K. L., Miller, S. M., & Evans, W. J. (2002). Computer-assisted live supervision in college counseling centers. *Journal of College Counseling*, 5(2) 187-192.

- Mora, F., Cone, S., Rodas, E., & Merrell, R. C. (2006). Telemedicine and electronic health information for clinical continuity in a mobile surgery program. *World Journal of Surgery*, 30, 1128-1134. DOI archived at <http://dx.doi.org/10.1007/s00268-005-0204-9>
- Neukrug, E. S. (1991). Computer-assisted live supervision in counselor skills training. *Counselor Education & Supervision*, 31, 132-138.
- Trauner, M. & Yafchak, M.F. (2005). *Video conferencing cookbook. Video development initiative*. Retrieved October 23, 2008, from <http://www.vide.net/cookbook/cookbook.en/>
- Wegge, J. (2006). Communication via videoconference: Emotional and cognitive consequences of affective personality dispositions, seeing one's own picture, and disturbing events. *Human-Computer Interaction*, 21(3), 273-218. DOI Archived at http://dx.doi.org/10.1207/s15327051hci2103_1
- Williams, J. B. W., Ellis, A., Middleton A., & Kobak, K. A. (2007). Primary care patients in psychiatric clinical trials: A pilot study using videoconferencing. *Annals of General Psychiatry*, 6, 24. DOI Archived at <http://dx.doi.org/10.1186/1744-859x-6-24>