New Developments in Technology-Assisted Supervision and Training: A Practical Overview

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Clinical supervision and training are now widely available online. In this article, three of the most accessible and widely adopted new developments in clinical supervision and training technology are described: Videoconference supervision, cloud-based file sharing software, and clinical outcome tracking software. Partial transcripts from two online supervision sessions are provided as examples of videoconference-based supervision. The benefits and limitations of technology in supervision and training are discussed, with an emphasis on supervision process, ethics, privacy, and security. Recommendations for supervision practice are made, including methods to enhance experiential learning, the supervisory working alliance, and online security. © 2014 Wiley Periodicals, Inc. J. Clin. Psychol.: In Session 70:1082–1093, 2014.

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Psychotherapy supervision and training are rapidly moving online. A Google search reveals psychotherapy training via Internet-based videoconference in virtually all major psychotherapeutic modalities, including acceptance and commitment therapy (ACT), cognitive-behavioral therapy (CBT), dialectical-behavioral therapy (DBT), emotion-focused therapy (EFT), eye-movement desensitization and reprocessing (EMDR), intensive short-term dynamic psychotherapy (ISTDP), and psychoanalysis, among others. Clinical supervisors are quickly integrating numerous new technologies into their practice, including webcams, tablet computers (e.g., the iPad), the Internet "cloud," web-based software for tracking clinical outcomes, and smartphone applications, or "apps" (e.g., www.isupelive.com).

As the development and integration of technology into supervision proceed, research on its effectiveness is attempting to keep pace. Over 25 clinical research studies on technology-assisted supervision and training (TAST) have been conducted since 2000 in training sites around the world, including Australia, Canada, England, Norway, and the United States (e.g., Reese et al., 2009). The potential benefits of TAST are clear, including greatly increased flexibility, reduced travel costs, and the opportunity to address the limited availability of clinical training in rural, remote, and underserved areas. However, many supervisors have questions about TAST that remain unanswered, including concerns about security, confidentiality, ethics, regulations, supervision process, and technological competence (Rousmaniere, 2014).

The goal of this article is to provide clinical supervisors with a practical and accessible overview of three of the most widely adopted, newest Internet-based developments in TAST: videoconference supervision, cloud-based file sharing software, and clinical outcome tracking software. These technologies will be discussed in the context of their potential benefits and risks for supervisees, supervisors, and clinical treatment.

Videoconference Technology

Of all the new technologies being applied to supervision and training, videoconferencing has quickly become the most widely used medium in practice. Originally, videoconference was

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largely used to provide individual supervision to trainees in rural or remote areas (e.g., Stamm, 1998), or in international settings (e.g., Panos, Panos, Cox, Roby, & Matheson, 2002). However, videoconference is increasingly being used by urban clinicians for a wider range of purposes, such as seeking training in advanced psychotherapy from geographically distant experts (Abbass et al., 2011) and providing live one-way-mirror supervision (Rousmaniere & Frederickson, 2013; www.isupelive.com).

Recent advances in videoconference software permit group videoconferencing from multiple locations simultaneously and the option for digital recordings to be shown within videoconference software, permitting supervisors to provide video recording-based group psychotherapy training for an international pool of trainees. Recently, some large supervision and training organizations have adopted videoconference as a primary means of providing international supervision to large cohorts of supervisees (e.g., Fishkin, Fishkin, Leli, Katz, & Snyder, 2011).

Research on Videoconference Supervision and Training

Recent empirical research suggests that videoconference may be effective for individual supervision and group supervision (e.g., Rees, Krabbe, & Monaghan, 2009) as well as for didactic trainings (e.g., Weingardt, Cucciare, Bellotti, & Lai, 2009). Research also suggests that videoconference may benefit supervision in unexpected ways. For example, in one study (Sørlie, Gammon, Bergvik, & Sexton, 1999), both trainees and supervisors reported preparing more thoroughly for videoconference supervision, perhaps because of uncertainty about the new supervision format. The same study found that some supervisees reported increased self-disclosure, which they attributed to a feeling of safety due to the increased experienced distance from their supervisor (e.g., Sørlie et al., 1999). Anecdotal experience and case reports suggest that videoconference can be effective for international and cross-cultural supervision (e.g., Panos et al., 2002), and live one-way-mirror supervision (Rousmaniere & Frederickson, 2013).

On the other hand, research has also indicated some potential concerns about videoconference training. The most frequently cited concern about videoconference supervision is the potential for reduced accuracy or depth of communication between the supervisor and supervisee because of the visual constraints and inconsistent audio quality inherent in videoconference (e.g., Kanz, 2001). However, the effect of this factor is unclear; although some research has found the limited visual range to be potentially problematic (e.g., Sørlie et al., 1999), multiple studies have found the videoconference supervision format to maintain the supervisory working alliance at an equivalent level to in-person supervision (e.g., Reese et al., 2009).

Other concerns about videoconference supervision include heightened anxiety in some supervisees (e.g., Sørlie et al., 1999), the impaired ability of supervisors to provide help from a distance because of unfamiliarity with local laws and regulations (e.g., Abbass et al., 2011) and possible reduced effectiveness when compared to in-person training (e.g., Sholomskas et al., 2005). Given these concerns and challenges, it is recommended that supervisors using videoconference emphasize a collaborative approach to supervision, especially in light of recent data that highlight the importance of collaboration for maintaining a positive supervisory working alliance (Rousmaniere & Ellis, 2014).

One of the promising benefits of videoconference is facilitating international supervision (e.g., Fishkin et al., 2011). However, there is a chance that the geographic distance between the supervisory dyad could increase the risk of cultural misunderstandings (Powell & Migdole, 2012). Panos et al. (2002) proposed the "triad model" of supervision, in which supervisees have two supervisors: one onsite who is well versed in local culture, and one online who possesses the needed competence in clinical supervision.

It is worth noting that most of the research on the use of technology in supervision and training has been done by "early adopters" of those same technologies, who may be subject to a pro-technology bias (Rousmaniere, 2014). As the field moves forward, it is increasingly important for additional research to be completed by neutral parties.

Required Equipment

Until the turn of the century, videoconference was available only through dedicated hardware systems (e.g., Stamm, 1998), whose prohibitively high cost made it largely impracticable for use by individual clinicians. However, the recent decrease in computer costs and increase in Internet connectivity speeds have made the accessibility of videoconference nearly ubiquitous. The new generation of supervisors entering the field "grew up" with Internet technology, and thus they are more likely to be comfortable integrating videoconference into their supervision practice. Many large technology companies now provide free software for individual or group videoconferencing (e.g., Skype, Google, Apple). Virtually all new personal computers, smartphones, and tablet computers come with videoconference software preinstalled: The website www.telementalhealthcomparisons.com has a free list of videoconference software that is searchable by feature (e.g., HIPAA-compliant security).

Videoconference for Individual and Group Supervision

Although the medium is different, the format for individual and group videoconference supervision can be essentially the same as in-person supervision. Supervisees can present cases using notes, audiotapes, or videotapes, have group discussions, and engage in clinical role-plays or skill-building exercises. For supervisors who want to watch video recordings of supervisees' sessions, multiple options exist. The technologically simplest option is to have the supervisee mail a copy of the video to the supervisor before their meeting time, in any format usable by both parties. Both parties can then watch the video simultaneously while discussing it via videoconferencing. The video can be played on the computer that is used for the videoconference, or a separate device (e.g., a television).

The advantages of this option are very high-quality video and avoiding the use the Internet, thus reducing security concerns; however, it is still possible that patients' protected health information may be discussed via videoconferencing. The disadvantages are cost and the hassle of mailing videos (especially for group supervision).

Another option for watching videos during videoconference supervision is for the supervisee to play the video on his or her computer while using the "share screen" option available in most videoconference software (e.g., Vsee). An advantage of this option is that it is technologically simple, especially for group supervision. However, screen sharing may use more Internet bandwidth, which can reduce the quality of the videoconference.

A third option is for the supervisee to send a copy of the video electronically, over the Internet. For this method, it is recommended to use a file-transfer service that is compliant with the standards of the Health Information Portability and Accountability Act (HIPAA, see below for a list) and/or encryption software (e.g., www.truecrypt.com or www.boxcryptor.com). This method is a very fast and economical way of sharing videos, especially for group supervision, but is technologically more challenging. (See below for further discussion on file-transfer programs). While watching videos, supervisors may use a text-chat window or "whiteboard"–a software feature that lets users draw or write on a blank screen during a videoconference–to comment on the video while it is playing.

Following is a partial transcript of a videoconference-based supervision group. The supervisor specializes in intensive short-term dynamic psychotherapy. In this transcript, the psychotherapist and supervisor are discussing a psychotherapy session video, via text chat while the video is playing. In the video, the client had visualized hitting her husband, with whom she was angry. The psychotherapist was unsure if this was therapeutic for the client, because she seemed detached during the visualization. The supervisor watched the client's physical signals on the videotape (e.g., body tension, movement) and dialogued with the psychotherapist via text chat. The other members of the group watched the video and text chat in real-time. This transcript demonstrates how subtle and nuanced aspects of psychotherapy can be effectively addressed via videoconference supervision.

[10:06:59] Therapist: she's talking about her husband here
[10:07:23] Therapist: she has very short portrait then guilt [a "portrait" is the client's visualization of hitting her husband]

[10:09:00] Supervisor: she is a bit of an actor [suggesting she is not connected to emotions]
[10:09:06] Therapist: compliance?
[10:09:08] Supervisor: not sure how attached she is to the feelings here
[10:09:27] Therapist: what tells you that in her presentation?
[10:09:46] Supervisor: it seems superficial. lack of [verbal and visual] signals throughout
[10:09:55] Therapist: what would you do here?
[10:10:09] Supervisor: what problems inside does she have?
[10:10:18] Therapist: anxiety re conflict with husband and others
[10:10:19] Supervisor: is she hitting a projection?
[10:10:34] Therapist: husband repeatedly says things that bother her
[10:10:44] Supervisor: I'm not certain here about what psychic structure we are seeing here
[10:10:58] Therapist: I don't understand
[10:11:30] Supervisor: no signals of unconscious anxiety so either no neurosis or she is splitting and using projection
[10:11:39] Supervisor: so is this compliance?
[10:11:47] Therapist: that was my guess. her father was extremely physically violent throughout her childhood
[10:12:06] Supervisor: need an intrapsychic focus: this seems external
[10:12:36] Therapist: this felt real to me - the guilt. What do you think here?
[10:13:56] Supervisor: not certain yet

Later in the same supervision session, the group watched a video of the same psychotherapist working with a different client. The supervisor described the difference in behavioral signals between the two clients, via text chat.

[10:23:08] Supervisor: look at the differences here vs the last person
[10:23:18] Therapist: yes I see that
[10:23:22] Supervisor: tense, smiling, inhibiting, sighing, laughing, hands tense
[10:23:37] Supervisor: hesitation in speech
[10:23:46] Supervisor: this is a neurotic person for sure
[10:24:35] Supervisor: she has unconscious anxiety and unconscious defenses = neurosis or character neurosis

Videoconference for Live One-Way-Mirror Supervision

Live "one-way-mirror" supervision was originally developed for training in family therapy, but is now used widely, across a range of training programs (Bernard & Goodyear, 2014). The use of videoconference for live one-way-mirror supervision has been termed Remote Live Supervision (RLS; Rousmaniere & Frederickson, 2013). RLS requires the same equipment as regular videoconference supervision. The client and supervisee sit across from each other, similar to a traditional therapy room. A webcam transmits live video of the client during the therapy session to the supervisor in another location, via videoconferencing.

There are two formats for RLS: visual and audio. In visual format RLS, the supervisor types text interventions into a chat window in the videoconference software. A laptop computer sitting next to the client displays the supervisor's interventions in large type, like a teleprompter for the supervisee. Alternately, in audio format RLS, the supervisor speaks interventions into the computer's microphone, which are heard by the supervisee via an earpiece. The supervisee decides which interventions to integrate into psychotherapy. If the supervisor wishes to save a video of the session, a separate device may be used for this purpose (Rousmaniere & Frederickson, 2013). Although RLS was developed to provide distance training, it may also be used as an alternative to a one-way-mirror to provide live supervision to supervisees in the same location as the supervisor. Similarly, Angela Yu recently developed ISup, an innovative app for live one-way-mirror supervision (www.isupelive.com), in which the supervisor's interventions appear on an iPad sitting on the psychotherapist's lap.

Most supervision occurs some time after a psychotherapy session, with the use of aids to help recall what occurred during the session (e.g., process notes, video recordings). This kind of

supervision engages a cognitive method of learning, which helps the supervisee better understand psychotherapy processes and models. In contrast, live supervision occurs during a psychotherapy session, so it also engages an experiential method of learning. Because the supervision is in real-time, the supervisee can experience the supervisor's ability to make moment-to-moment clinical assessments and interventions. Because the supervisee receives the supervisor's guidance at the exact moment it is needed, live supervision facilitates state-dependent learning, which can help build procedural psychotherapy skills while simultaneously advancing cognitive learning.

Likewise, in live supervision the supervisee can "walk in the supervisor's shoes" and feel the psychotherapy model in action. For these same reasons, however, live supervision is a very challenging training method. The supervisee must simultaneously track communication from both the client and the supervisor. New clinicians may risk feeling confused or lost during the session, or may passively obey the supervisor's instructions (Bernard & Goodyear, 2014).

Furthermore, the distance component of RLS may heighten the potential challenges or risks inherent in live supervision. For example, if beginning clinicians do not have the skill (technical or interpersonal) to apply the supervisor's interventions, a clinical problem could be created in a future psychotherapy session when the supervisor is not online for assistance. For example, if a supervisor helps a psychotherapist focus on a client's previously avoided trauma, then it is critical that the psychotherapist have the skills necessary to assess the client's emotional stability and safety in future sessions when the supervisor is not present. (It is worth noting, however, that all supervision formats are subject to the risk of supervisees incorrectly implementing the supervisor's instructions.) Thus, although research has suggested that in-person live supervision may be effective for beginning trainees (Bartle-Haring, Silverthorn, Meyer, & Toviessi, 2009), RLS may not be suitable for prelicensure trainees located in a distant location or different jurisdiction than the supervisor (Rousmaniere & Frederickson, 2013).

A Clinical Example

Below is a partial transcript from a RLS session. The psychotherapist had sought supervision because progress in this case had stalled. In this RLS session, the supervisor hypothesized that the psychotherapy had stalled because the therapeutic dyad had fallen into an unhelpful cycle of passive dependency, in which the psychotherapist would give advice and the client would passively listen, without true engagement. The partial transcript shows the supervisor helping the psychotherapist break out of the passive dependency cycle and reground the psychotherapy in the client's will to change (Frederickson, 2013).

The session began with the psychotherapist asking the client what he wanted to work on. As had happened in previous sessions, the client appeared bored and began flipping back and forth between wanting to address his problems and wanting to avoid them. To help the psychotherapist remain neutral, the supervisor typed two lines to say to the client, at 2 and 3 minutes into the session. (The text appeared on a laptop sitting next to the client, like a teleprompter for the psychotherapist.)

[11:02:08] Supervisor: notice even now you offer two versions and sit on the fence
[11:03:08] Supervisor: If you don't know why you're here, I sure don't.

After the psychotherapist said these lines, the client became more focused. The client looked at the psychotherapist expectantly, waiting for the psychotherapist to provide an answer to the psychotherapist's own question ("What do you want to work on today?"). The supervisor anticipated that the psychotherapist would have difficultly not rescuing the client from his own passivity (by jumping in to answer the psychotherapist's own question), so the supervisor repeatedly typed instructions for the therapist to wait. Note that these instructions are only 8 to 28 seconds apart.

[11:03:43] Supervisor: [Just keep waiting for him]
[11:04:00] Supervisor: [At this point just say, "go ahead"]
[11:04:25] Supervisor: [wait while he is passive to let feeling build]
[11:04:52] Supervisor: [wait]

[11:05:24] Supervisor: [wait]
[11:05:32] Supervisor: [wait]

The pressure in the session grew. The client tested the psychotherapist's will by saying, "I'm not sure if I can answer your question." To help the psychotherapist emphasize his stance of patience, the supervisor typed lines for the psychotherapist to say to the client, and instructed him to wait.

[11:05:48] Supervisor: take your time
[11:05:52] Supervisor: take your time
[11:06:55] Supervisor: sounds like you feel stuck
[11:07:52] Supervisor: [wait]

As the pressure in the session grew, the client began to grow frustrated with feeling stuck. The client described the mental dialogue that kept him stuck. When the client had done this in previous sessions, the psychotherapist had argued with the reasoning of the client's internal dialogue, trying to convince the client that his thoughts were illogical. This strategy had failed, as the client would simply take the opposing side of the argument and refuse to change. Anticipating this, the supervisor typed a paradoxical approach for the psychotherapist to use–to become a "devil's advocate" and argue for the client to remain stuck. This helped shift the conflict from interpersonal (between the psychotherapist and client) to intrapsychic (within the client himself). Most of the supervisor's comments are about 30 seconds apart.

[11:08:22] Supervisor: may be important to stay stuck until you are certain about what to do
[11:08:59] Supervisor: may be important to respect how the stuckness may be helping you
[11:10:28] Supervisor: You're a smart guy. Must be a good reason to believe those stories.
[11:10:49] Supervisor: [excellent]
[11:11:23] Supervisor: it may be important not to know what you want
[11:12:55] Supervisor: no decisions = no negative consequences

This partial transcript demonstrates how RLS can facilitate experiential learning for challenging psychotherapy cases. Anecdotal experience suggests that this aspect of RLS is particularly effective for helping supervisees become aware of blocks in treatment that have occurred outside the supervisee's awareness (for example, due to counter-transference). Because the supervisor is able to give moment-to-moment guidance, he or she can "hold" the supervisee, providing cognitive and emotional support at the exact moment it is needed. All of the supervisor's comments are, in effect, interventions for both the client and the trainee.

Videoconference Reliability

Videoconference generally requires an Internet connection speed of .5 Mbps or greater. (Readers can test their personal Internet connection speed at www.speedtest.net.) Anecdotal experiences suggest that the reliability of videoconference software and Internet connections are mixed, so users should expect occasional problems with dropped calls or poor connectivity. For example, in the first author's experience using videoconference over 3 years, about 20% of the sessions had some degree of connectivity problems, at both private practice and university sites. For this reason, videoconference should only be used if both the supervisor and the supervisee are comfortable with this limitation, and backup methods for communication should be identified and agreed to in the informed consent process (e.g., phone).

The reliability of videoconference is vulnerable at two points: the Internet connection and the software. Even if the user has a high-speed Internet connection, connectivity problems may occur at any point in the videoconference connection, including international Internet nodes outside of the user's country. Likewise, no videoconference software provider has been demonstrated to be more reliable than others, unless one is willing to purchase a dedicated videoconference line, which generally costs over $10,000. Thus, the reliability of videoconference technology is unfortunately mostly outside users' control. However, the following steps may help improve videoconferencing quality: (a) get the fastest Internet connection available in the area; (b) close

Table 1
Five Simple Steps to Enhance Online Security

1. The most important security procedure is to use "strong" passwords: do not use birthdays, names, or words in the dictionary; use at least eight characters; and use a combination of numbers, special characters (e.g., *&@), and upper/lower-case letters.
2. Do not use the same passwords for multiple accounts.
3. Turn on Two-Factor Identification for your email accounts.
4. Be extremely careful when downloading attachments in e-mails or clicking on links in e-mails. This is possibly the most common way to get a virus and have your e-mail account hacked.
5. Use antivirus and antispyware software, and keep the software updated.

Internet-intensive programs running in background while using videoconference (e.g., Internet-based file-sharing software); (c) limit the use of "screen sharing" features; and (d) turn off the video camera when Internet connectivity is poor.

Security and Confidentiality

Videoconference supervision usually involves the transmission of patient protected health information (PHI), and thus may fall under Health Insurance Portability and Accountability Act (HIPAA) regulations, which set minimum standards requiring the protection of the confidentiality of all electronic health information. The American Recovery and Reinvestment Act of 2009 included The Health Information Technology for Economic and Clinical Health Act (HITECH), which significantly expanded the scope of HIPAA to further cover health providers' "business associates" and increased penalties for noncompliance, in addition to other changes. Although enforcement of HIPAA was generally limited, HITECH mandates the department of Health and Human Services to perform regular audits of health providers and business associates.

Videoconferencing software that permits compliance with HIPAA is also now available at affordable pricing. However, most videoconference software (including Skype) runs through a central server, and thus is not considered "secure" by HIPAA. One risk is that an employee of the videoconference company could listen in on a session. For this reason, it is important to fully inform supervisees about the limits of confidentiality, and patient consent should be obtained if PHI is transmitted over videoconference. However, it is worth noting that this risk is theoretically no greater than the risk of a telephone company employee listening in on a supervision or psychotherapy session done via telephone. (See Table 1 for a list of five simple steps to enhance online security.)

A thorough discussion of HIPAA/HITECH is beyond the scope of this article. However, clinicians who use videoconference or any other electronic communication of PHI are advised to consult with the HIPAA compliance officer in their institution's information technology department or local professional association (Rousmaniere, 2014). For a thorough discussion of videoconference security, confidentiality, and HIPAA, see http://www.zurinstitute.com/skype_telehealth.html#debate.

Regulatory Issues

The regulation of Internet-based supervision is varied and rapidly changing. In their comprehensive survey of 46 state counseling regulatory boards, McAdams and Wyatt (2010) found that regulations on Internet-based supervision had been established in six states and were in development or discussion in 18 states, and that Internet-based supervision was prohibited in 19 states. Sixty percent of boards limited the hours of Internet supervision that could be applied to licensure, with the limits ranging from 10% to 50% of total hours (McAdams & Wyatt, 2010).

Likewise, a number of professional associations in the United States have developed guidelines for the practice of Internet-based supervision, but these tend to be vague and do not provide supervisors with specific guidance. Note, for example, the following paragraph from the recently

released "Guidelines for the Practice of Telepsychology" (American Psychological Association [APA], 2013):

> Psychologists using telepsychology to provide supervision or consultation remotely to individuals or organizations are encouraged to consult others who are knowledgeable about the unique issues telecommunication technologies pose for supervision or consultation. Psychologists providing telepsychology services strive to be familiar with professional literature regarding the delivery of services via telecommunication technologies, as well as competent with the use of the technological modality itself. In providing supervision and/or consultation via telepsychology, psychologists make reasonable efforts to be proficient in the professional services being offered, the telecommunication modality via which the services are being offered by the supervisee/consultee, and the technology medium being used to provide the supervision or consultation. In addition, since the development of basic professional competencies for supervisees is often conducted in-person, psychologists who use telepsychology for supervision are encouraged to consider and ensure that a sufficient amount of in-person supervision time is included so that the supervisees can attain the required competencies or supervised experiences. (para. 1)

These guidelines emphasize that supervisors should become proficient and competent in technologies being used. However, assessing the exact extent of technological competency required for ethical supervision practice may be unclear to supervisors. Indeed, assessing competency in technology can be quite tricky, because many technologies update themselves frequently, so someone who is competent in a program one day may be mystified by it the next. Likewise, it is unclear what constitutes a "sufficient amount of in-person supervision time" because there is only preliminary research comparing in-person to online supervision (Rousmaniere, 2014).

Supervisees using videoconference for distance supervision or training are advised to form good relationships with local mentors and consultants in case clinical issues arise that may not be addressed well by distance supervision, such as compliance with local laws, regulations, and professional guidelines (e.g., Abbass et al., 2011). Supervisors are encouraged to contact their local regulatory agencies or professional associations for answers to questions, including:

- Are there limits on the number of hours of Internet-based supervision that can count towards licensure, continuing education credits, etc.?
- Which jurisdiction has legal accountability when supervision or training is conducted across state lines or international borders?
- Are there informed consent requirements specific to videoconference supervision?
- Do any of the jurisdictions have confidentiality or privacy rules beyond HIPAA/HITECH?
- Do the supervisor or agency's professional liability insurance policies cover Internet-based supervision or supervision in multiple jurisdictions? (Kanz, 2001; McAdams & Wyatt, 2010; Rousmaniere, 2014; Vaccaro & Lambie, 2007).

Internet-Based "Cloud" File Transfer Software

The rapid increase in Internet connectivity speeds and decrease in data storage costs have created a recent flood of new low-cost, user-friendly Internet-based file transfer programs. These programs are often called "cloud-based" software. Visualize the Internet cloud as hundreds of thousands of computers, called servers, located in warehouses around the world. These servers are all connected to each other via the Internet. Technology companies rent servers for many purposes, ranging from data storage, running complex software, and performing research to military or security operations. Server companies often contract with backup server companies, also located internationally, to keep copies of the data in case of emergencies.

Cloud-based software is used by many new devices (e.g., the iPhone) and widely used Internet services (see Table 2). All new smartphones for sale today come with cloud-based software

Table 2
Software That Uses Cloud Computing

• Most backup software programs for computers and smartphones
• Internet-based photo and video organizing software (e.g., Apple iCloud)
• Internet-based file sharing programs (e.g., Dropbox)
• Internet-based e-mail programs (e.g., Gmail, Yahoo)
• Internet-based applications (e.g., Google Docs)

Table 3
HIPAA-Compatible Cloud File-Storage and Transfer Services

1. www.mydocsonline.com
2. www.egnyte.com
3. www.onramp.com
4. www.braveriver.com
5. www.box.com

preinstalled, and in the not-too-distant future many household appliances and automobiles will be connected to the cloud as well. The value offered by cloud computing is efficiency; large technology companies (e.g., Apple, Amazon, and Google) can provide high-quality services at very low prices, or even for free.

However, concerns have been raised about the use of cloud computing in the context of clinical supervision (e.g., Devereaux & Gottlieb, 2012). The foremost concern is that supervisors lose control of their data when they upload it to the Internet cloud. This is particularly a concern for confidential clinical information. Although server and backup server companies may promise to keep data secure, it is impossible for supervisors to assess their compliance, especially because the data are often stored in multiple locations. It is also possible that the staff who manage cloud-based services may not fully understand the scope and limits of clinical confidentiality.

Second, for supervisors who are unfamiliar with new technology, it can be challenging to ensure that the privacy settings on cloud computing software are set to "private." (Even technology consultants report having a hard time understanding the ever-changing and highly complex privacy settings in programs like Facebook.) Furthermore, many software programs have "public" as the default privacy setting. This means that any information uploaded by that program can be accessed by anyone on the Internet, or even possibly found through Google searches (i.e., "google hacking").

For these reasons, the current, safest option for the storage or transfer of confidential information (e.g., clinical notes or video recordings) is to not use cloud computing software (E. Rodolfa, personal communication, October 3, 2012). However, avoiding cloud-based software is not a guarantee of security, because any Internet connection by any program or device can be a route for malicious data theft or inadvertent data loss. Indeed, avoiding cloud-based software may soon be impossible; it is likely that in the near future all records will be cloud-based. Thus, instead of adopting a fear-based avoidance strategy to the cloud, supervisors should instead learn how to take appropriate precautions to use the cloud safely.

First, supervisors can use a HIPAA-compatible cloud-based service (see Table 3). Second, supervisors should ensure that client consent is obtained whenever confidential information is stored or transferred using cloud-based services (Devereaux & Gottlieb, 2012). Third, for an added degree of security, supervisors can utilize encryption software (e.g., www.boxcryptor.com or www.truecrypt.com). The use of encryption software provides a very strong degree of protection for confidential data (arguably much stronger than a locked file cabinet), even if the cloud-based program is compromised. Encryption software also protects against the threat of confidentiality breaches by inside personnel, such as information technology staff at an agency, government, or university setting.

Table 4
Web-Based Software for Continuous Assessment

- OQ-Analyst (www.oqmeasures.com)
- CCAPS (ccmh.squarespace.com/ccaps/)
- Carepaths (www.carepaths.com.)
- ASIST (www.clientvoiceinnovations.com)
- Wellness Check (www.wellnesscheck.net)
- MyOutcomes (www.myoutcomes.com)
- FIT-Outcomes (www.FIT-Outcomes.com)
- CORE (www.coreims.co.uk)
- Celest Health (www.celesthealth.com)

Technology to Facilitate Continuous Assessment of Clinical Outcomes

A third new technological development becoming widely adopted in clinical supervision and training is the use of computer software to facilitate session-by-session clinical outcome assessment (e.g., Lambert, 2010; see Table 4 for more software options). With continuous assessment (CA) software, clients can complete outcome measures on a desktop computer, laptop, tablet, or their smartphone while still in the clinician's waiting room. Most CA programs take just a few minutes for a client to complete. The software automatically graphs the client's progress and highlights risk factors, such as projected clinical deterioration or suicidality.

Research has demonstrated that many clinicians have a positive bias regarding their own clinical skills, and a blind spot that prevents them from correctly assessing their own clients' risk for clinical deterioration (Lambert, 2010). CA programs provide an empirical perspective that may help improve clinical outcomes by addressing this blind spot. Because the blind spot is common to pre- and postlicensure clinicians (Lambert, 2010), CA programs are useful for both training of prelicensure clinicians and aiding licensed clinicians in self- or peer-supervision. Compared to paper measures, the new generation of CA software greatly reduces the time burden of outcome assessment.

One of the first examples of CA software was the "clinical support tools," a program that provides session-by-session feedback to clinicians on clients that are at risk for deterioration, via the Internet-based OQ Analyst software package (Whipple et al., 2003). Another popular CA program is the Partners for Change Outcome Management System (PCOMS), developed by Miller, Duncan, Sorrell, and Brown (2005), which utilizes the Outcome Rating Scale (ORS) and Session Rating Scale (SRS), ultra-brief measures of clinical outcome, and the therapeutic working alliance. Controlled studies (e.g., Anker, Duncan, & Sparks, 2009) have demonstrated that the use of PCOMS can help clinicians achieve significantly better clinical outcomes. Another CA program, the *Counseling Center Assessment of Psychological Symptoms* (*CCAPS*), was developed specifically for use at university counseling centers, is integrated into popular electronic records management programs, and is currently in use by over 200 university counseling centers (Locke, Bieschke, Castonguay, & Hayes, 2012).

Two additional examples of CA technology are the Evidence-Based Assessment System for Clinicians, a collection of more than 30 web-based assessment measures covering a wide range of issues, such as gambling, attention deficit hyperactivity disorder, sports anxiety, and alcohol use, all of which can be completed by clients via the Internet or their smartphone (Smith et al., 2011), and the Contextualized Feedback System, a collection of web-based measures designed for couples and family therapy (Bickman, Kelley, & Athay, 2012)

CA can be used in a variety of ways in supervision. The most common method is for the supervisory dyad to review the CA data, in every supervision session, for each case discussed. This helps supervisees to learn to monitor their clinical progress and assess risk of deterioration, on a session-by-session basis. When used in this manner (as part of regular supervision), CA programs have repeatedly been demonstrated in controlled studies to decrease dropout rates, achieve better clinical outcomes, and reduce the likelihood of client deterioration (e.g., Anker et al., 2009).

Regular use of CA tools teaches an empirical approach to clinical practice and helps supervisees gain an empirical perspective on their own clinical effectiveness. At the end of every training year, one of the authors asks his supervisees to make a list of all of their clinical cases in a spreadsheet, with the presenting problems and outcome data for every case. Reviewing this list can help identify the trainees' clinical strengths and challenges. Reviews like this can also help counter the tendency of some trainees to devalue or glorify their own work.

Conclusion

The pace of development of clinical supervision and training technology is growing rapidly. As new generations of supervisors who are comfortable with technology begin their careers, it is likely that new technologies will increasingly become integrated into supervision as routine practice. Although the development of new technologies has outpaced research on their effectiveness, a growing body of data that suggests that TAST can be effective and safe, if used conscientiously, in the context of the limits posed by the technology (e.g., using strong passwords, disclosing potential confidentiality concerns and obtaining client consent, balancing online and face-to-face supervision).

We would like to conclude with a note on perspective. Most of the research and theorizing on technological developments in supervision and training have focused on evaluating whether the new technologies can approximate the experience of "traditional" in-person supervision and training. Although this approach makes sense, it rests on the assumption of superiority in traditional supervision methods. This assumption has questionable validity and may be arbitrarily limiting. The traditional methods of supervision are in wide use because they were the only methods available, not because research determined them to be the most effective (e.g., Ellis & Ladany, 1997). Making the assumption that the "old methods are best" may do the field a disservice by blinding us to new opportunities and alienating a younger generation of supervisees who identify with technology being integrated into every part of their lives.

Rather than questioning whether TAST is "as good" as traditional supervision, supervisors and researchers may consider asking instead, "What is now possible and how can it serve my supervisees and their clients?" Supervisors serve multifaceted roles; in addition to their gatekeeper role, supervisors, by necessity, must also be clinical explorers and inventors. We propose that the same skills that enable supervisors to be flexible and adaptable in an always-changing clinical environment can serve them well in the new technological frontier.

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