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This brief report discusses the use and feasibility of telemedicine technology in the dissemination of Parent-Child Interaction Therapy (PCIT). PCIT is an empirically supported behavioral parent training program for reducing disruptive behavior in young children and for reducing future rates of child physical abuse. The positive impact PCIT has demonstrated in reducing child maltreatment has galvanized interest in widespread dissemination of the PCIT model into child service systems. PCIT has traditionally been taught in university-based training programs in a mentored cotherapy model. By contrast, in field settings, PCIT training typically consists of workshop training supplemented by a period of telephone consultation (PC). Given concerns with the level of practitioner competency and fidelity yielded by the PC model, PCIT training programs have begun to examine Internet-based telemedicine technology to deliver live, mentored PCIT training to trainees at remote locations (Remote Real-Time or RRT) to better approximate the university-based training model. Challenges of disseminating evidence-based practices are discussed, using PCIT as a model of how these challenges are being addressed by telemedicine technology.

Keywords: *Parent-Child Interaction Therapy; dissemination; telemedicine; training*

Parent-Child Interaction Therapy (PCIT) is an empirically supported behavioral parent training program for reducing disruptive behavior in young children (Eyberg & Boggs, 1998) and for reducing future rates of child physical abuse (Chaffin et al., 2004). These encouraging findings with PCIT have galvanized interest in widespread dissemination of the PCIT model into child service systems. PCIT has traditionally been taught in university-based training programs in a mentored cotherapy model. By contrast, in field settings, PCIT training typically consists of workshop training supplemented by a period of telephone consultation (PC). Given concerns with the level of practitioner competency and fidelity yielded by the PC model, PCIT training programs have begun to examine Internet-based telemedicine technology to deliver live, mentored PCIT training to trainees at remote locations (Remote Real-Time or RRT) to better approximate the university-based training model. Challenges of disseminating evidence-based practices are discussed, using PCIT as a model of how these challenges are being addressed by telemedicine technology.

Brief Description of PCIT

Originally developed for families of children aged 2 to 7 with disruptive behavior disorders, PCIT includes two sequential phases and requires an average of 15 weekly sessions. Goals of the first phase, the Child-Directed Interaction (CDI), are to improve the quality of the parent-child relationship and strengthen attention and reinforcement for positive child behavior. In CDI, parents learn to follow their child's lead in dyadic play and provide positive attention combined with active ignoring of minor misbehavior. They are taught to use the PRIDE skills—Praise, Reflection, Imitation,

Description, and Enthusiasm—to reinforce positive, appropriate behaviors. Parents also learn to avoid particular types of behaviors—commands, questioning, criticism, sarcasm, and negative physical behaviors. This phase forms the foundation for effective discipline training in the second phase.

During the second phase of PCIT, the Parent-Directed Interaction (PDI), parents learn to direct the child's behavior when necessary and to provide consistent consequences after noncompliance. Parents are taught to give effective instructions, using single commands that are direct, positively stated, specific, age-appropriate, polite, and necessary. The parent proceeds to praise compliance or use a 3-minute time-out from positive reinforcement (time-out chair) for noncompliance. A PDI skill element always begins with a command and ends with the child being praised for compliance. The discipline protocol is structured, noncorporal, and designed to avoid escalating coercive cycles of parent-child interaction. Parents are trained to mastery criteria and consistent application is emphasized.

One of the distinguishing features of PCIT is an intensive delivery approach—direct live coaching of parent-child interactions. Live skill coaching of the parent during the parent-child interaction is the hallmark of PCIT. For both the CDI and PDI phases, the principles and skills are introduced in one teaching session with the caregiver(s) alone. In subsequent coaching sessions, after a homework review, therapists coach each parent-child dyad in turn. In traditional clinic-based PCIT, coaching is done via a wireless earphone through a one-way mirror. The parent and child interact in the therapy room, while the therapist coaches from an adjacent room behind the one-way mirror. Although a treatment room with a one-way mirror is preferred, PCIT has been conducted in home-based settings or other settings where the usual equipment and setup are not available with comparable or only slightly attenuated results (Nixon, Sweeney, Erickson, & Touyz, 2003; Ware, McNeil, Masse, & Stevens, in press).

The advantage of direct and coached practice with one's own child is both a general finding across parenting studies (Kaminski, Valle, Filene, & Boyle, 2008) and a specific finding among abusive parents (Chaffin et al., 2004; Wolfe, Edwards, Manion, & Koverola, 1988). Direct live coaching is well suited to violent or high-risk parents where large effects are necessary, and the delivery system used in PCIT is particularly well suited to skill acquisition in difficult cases. In contrast to parenting programs that focus on how parenting is talked about or conceptualized, PCIT focuses on how parenting is behaviorally delivered in vivo. A recent meta-analysis of parenting programs suggested that this type of delivery system is a key characteristic of more successful parenting programs (Kaminski et al., 2008).

Evidence-Based Practice Implementation Challenges

Technology transfer between services development and field practice settings has been identified as an emerging priority (NIMH, 2001). Moving evidence-based practice from development and research settings into scaled-up field practice involves far more than simply making effective practice models available to the field (Chadwick Center for Children and Families, 2004). First, it is fairly clear that simply providing information about new practice models or providing manuals describing techniques does not result in good practice uptake. This is especially true for "soft" technologies, like social services or mental health treatments, where practitioner interaction with clients is the essence of the intervention. Developing competency with soft technologies is a challenge. Actual cases present in idiosyncratic ways, providers bring preexisting belief systems and habits, and the nuances of model competency and expertise often are difficult to convey in even the best manual. Traditional continuing professional education methods, such as workshops or seminars, are simply inadequate to achieve competent and faithful technology transfer. For example, in a recent meta-analysis of implementation approaches, traditional techniques such as discussing theory and knowledge, demonstrating techniques, and role-playing techniques resulted in virtually no implementation of the new skills in the actual practice session (Joyce & Showers, 2002). Workshop or didactic training may be necessary but is clearly insufficient. When direct coaching and feedback to practitioners in the actual practice setting was added to workshop training, rates of implementation in the actual practice setting jumped from 5% to 95%. Similar findings have been reported across a range of practice settings (Kelly et al., 2000; Van den Homberg, Grol, Van den Hoogen, & Van den Bosch, 1999). Synthesizing the implementation research literature, Fixen, Naoom, Blasé, Friedman, and Wallace (2005) note that

> newly learned behavior is crude compared to performance by a master practitioner . . . [this] functional and adaptable set of skills is developed in practice with the help of a consultant/coach who shares craft knowledge as he or she observes, describes and tutors the practitioner. (p. 44)

When it comes to developing competency and fidelity with a new practice model, direct practitioner coaching in the actual practice setting appears to be a critical component. Direct practice observation and coaching also may be important to prevent drift. We distinguish drift from adaptation. Adaptation is a process usually undertaken by someone who already has achieved mastery to allow the model to be delivered faithfully and competently within situations where it otherwise might not fit. Drift, on the other hand, involves a misapplication of the model, often involving either technical errors or abandonment of core and requisite components. Drift occurs easily in field implementations and is often found to result in loss of effectiveness (Shoenwald, Sheidow, & Letourneau, 2004; Elliott & Mihalic, 2004).

Traditional PCIT Implementation Approaches and Their Limitations

PCIT was developed and historically has been trained almost exclusively within university-affiliated training programs, settings in which direct coached implementation has always been a key part of PCIT training. Similar to the way PCIT therapists directly coach parents in vivo, PCIT trainers have directly coached PCIT trainees. Traditional PCIT training progresses through two phases. First, new trainees are provided with basic didactic training, including the theory base for the model, the structure and set-up of treatment, and basic skills. This first phase usually includes observing the work of master practitioners and role-plays of basic techniques. This first phase of training usually takes about 1 full week and can be fairly easily replicated and delivered within scaled-up field settings. The difficulty lies in replicating the critical second phase of PCIT training.

During the second phase, experienced PCIT trainers mentor trainees using cotherapy mentoring. Trainers are directly present during the trainee's early work, and are active in observing, offering feedback, and coaching. When trainees encounter difficulties, trainers can take over coaching the parent to demonstrate key skills or nuanced adaptations. This second phase lasts approximately 6 months, during which trainees usually see several PCIT cases to completion. Phase 2 ends when mastery is achieved, and trainees then may move to verbal consultation (i.e., post hoc case discussion). The second phase of training in its conventional form is not realistically replicable in field implementation projects. It is neither financially nor logistically feasible for any but the most highly resourced field agencies to hire an expert in-house PCIT trainer or to import an expert trainer into their agency for 6 months. This dilemma is not unique to PCIT, but is shared by many other evidence-based models.

In practice, field implementation often skips this second phase of treatment, or offers an abbreviated version (e.g., periodic site visits), and relies primarily on post hoc verbal phone consultation. As with any skill, there may be limited correspondence between how trainees conceptualize or talk about their practice and how practice is behaviorally delivered. Dishonesty is not the issue—rather, trainees may believe that they are implementing the model well, describe their practice in model-consistent terms, but actually be misapplying the model. Video recording sessions for consultation may help to a limited extent, but does not approximate live coaching because of the lag between seeing the case and receiving feedback from the consultant. For example, a trainee may encounter a particular idiosyncratic implementation issue, then present the recorded session for consultation. The consultant may make suggestions, but cannot know whether the suggestions are implemented correctly until (a) the idiosyncratic implementation issue occurs again in a session, and (b) the trainee's new response to that issue happens to be recorded and presented again for consultation. This process, which occurs immediately during live coaching, may take weeks to occur in post hoc consultation using videos, if it occurs at all.

Although post hoc consultation is the standard approach used in field implementations of evidence-based practices, we believe that there may be serious limits to how well this approach generates mastery, and that this may be a key reason why client outcomes in field implementations rarely approach those obtained in efficacy trials (see Weisz, Donenberg, Han, & Weiss, 1995, for a discussion). Telemedicine offers a possible method to replicate the key aspects of traditional Phase 2 training in a way that is more feasible for field implementations.

Telemedicine Technology and Applications

Telemedicine and video conferencing applications are widely implemented in health care settings and are no longer novel technologies. For example, the American Telemedicine Association (2007) reports that more than 2,000 medical institutions across the country are using telemedicine technology, and more than $270 million in federal grants or contracts were issued in 2003 to support work in telemedicine. Mental health professional education or training uses have primarily involved teleconferencing workshops, post hoc verbal or e-mail consultation,

and linking isolated rural therapists to their professional community (Stamm & Cunningham, 2005). In their comprehensive review of the literature on teleconferencing based psychiatric applications involving both direct services and professional education, Maheu, Pulier, Wilhelm, McMenamin, and Brown-Connolly (2005) concluded that teleconferencing applications, although thus far not well studied for efficacy in generating client outcomes, did tend to yield good consultant-provider and consultant-patient communication and high provider and consumer satisfaction. They noted that the hardware, software, and broadband connectivity needed for more sophisticated live interactive telemedicine applications is now widely available, reliable, and user-friendly.

Feasibility Test of Remote Real-Time (RRT) PCIT Trainee Coaching

Beginning in 2004, as part of SAMHSA's National Child Traumatic Stress Initiative (NCTSI), our clinic began developing a Native American cultural adaptation of PCIT and then PCIT didactic training with staff from five NCTSI sites in Washington, Oregon, Oklahoma, Utah, and Alaska. Initially, Phase 2 training was done via post hoc telephone consultation and video review. Because of concerns over the adequacy of phone consultation, we began to explore alternatives. Working with the Telemedicine Department, a number of RRT mock-up options were tested. Laboratory mock-up with dedicated teleconferencing equipment (a Polycom model VSX7000–based system) using high bandwidth, dedicated network connections, and a dedicated IP address performed quite well. This system allows screen refresh rates of at least 60/sec, producing a television-quality image with multiscreen capability (split-screen or picture-in-picture) and instantaneous dual-channel voice communication.

The RRT approach is designed to approximate the traditional mentored cotherapy PCIT training model in a more feasible, less costly way which is suited to field implementation. In this approach, Internet telemedicine technology allows trainers to provide live consultation to the trainee during PCIT cases in real-time. The RRT system currently in place has the following characteristics for the trainer: (a) the trainer at the primary location can observe and hear PCIT sessions at the remote location in real time; (b) on split screens, the trainer also can observe the PCIT therapist trainee in the remote observation room; (c) the trainer can remotely control the camera at the remote site to pan or zoom; (d) the trainer can listen to the coaching given to the parent by the therapist trainee; (e) the trainer can talk directly and privately to the therapist trainee to give feedback or coaching; and (f) the trainer can directly coach the parent to demonstrate a skill or approach, that is, the trainer can talk to the parent with the therapist trainee listening.

The system equipment on the trainer's end is compact, fits easily on a desktop, and can be deployed in any office with a dedicated network port and dedicated IP address. The RRT system has the following characteristics for the remote therapist trainee: (a) the therapist trainee can see the trainer, (b) the therapist trainee can talk privately to the trainer during session, (c) the therapist trainee can receive immediate feedback on his or her skills and modify coaching accordingly, and (d) the therapist trainee can listen as the trainer coaches the parent. Equipment on the trainee's side is a similar, compact desktop set-up, all contained behind the one-way mirror. Trainer logs of sessions that recorded technical problems indicate that technical problems were noted early during the feasibility test period at most sites, but were uncommon in later sessions. The training program provides an IT specialist to install, remove, and troubleshoot the RRT equipment, and this specialist generally makes contact with the person at the community agency responsible for IT-related issues.

Satisfaction with RRT training. Based on the success of the initial RRT consultation, our training center entered into several training contracts that combine RRT with phone consultation (PC). A group of recent trainees was surveyed about their attitudes toward the two consultation models. This basic satisfaction survey was developed to assess clinicians' satisfaction with both PC and RRT consultation. Therapists were asked to rate consultation on a variety of dimensions, including utility in enhancing their clinical skills, their comfort with the mode of consultation, and assistance in revealing technical errors. Respondents expressed high satisfaction with both forms of consultation, and reported that phone consultation was more comfortable for them while RRT was more helpful overall. All 10 of the respondents who had participated in both PC and RRT indicated a preference for RRT over PC.

It is interesting that in this very small sample PC was favored over RRT in terms of comfort level for the trainee and consultant's understanding of the case presentation, yet 100% of therapists indicated that they would prefer RRT over PC if they could only have one form of consultation. For the 8 questions probing the elements of consultation, trainees rated RRT higher for skills-based elements (3 questions) and rated PC higher for conceptual elements (5 questions) like problem-solving. These findings are readily understandable in that consultants should

be expected to convey more understanding of the case during an hour of PC than in RRT, where case discussion is quite limited. Additionally, many more hours of PC were provided in the current training group relative to the hours of RRT. The trainees' increased comfort level with PC versus RRT seems analogous to the increased comfort that trainees feel in a lecture format relative to role playing during workshop trainings. Being asked to perform a skill may be more anxiety-provoking than being asked to sit and listen to a trainer's advice.

Cost effectiveness. Drawbacks of RRT technology involve the cost of equipment and the technical requirements of installing and using the equipment. The RRT equipment used in the current project is costly (approximately $5,000 per unit). Units owned by the training center are rotated among training agencies in 6-month intervals to reduce costs. Each transfer of equipment requires travel time and several hours of work time on the part of the IT technician. The two methods of consultation are roughly equivalent in terms of time required on the part of the trainee (approximately 1 hour per week for PC or RRT), and may even be advantageous to agencies because the RRT occurs during a billable hour. PC requires that agency therapists forego a billable hour for the weekly phone call, and involves scheduling a mutually convenient time for the PC participants. RRT requires more trainer time, 1 hour per week for each RRT trainee as opposed to 1 hour per week for a group conference call. However, relative to videotape supervision or site visits, the traditional methods of providing Phase 2 PCIT training, RRT is very efficient in terms of trainer's time. In approximately an hour (5 to 10 minutes prior to the session for planning, 50 to 60 minutes for the therapy hour, and 5 to 10 minutes postsession for feedback), the consultant can accomplish case planning, direct observation, assessment of competence, modeling by the trainer, and direct feedback to the trainee.

Conclusion and Future Directions

Given the challenges presented by the science of technology transfer, it is hoped that technology-assisted consultation, such as RRT, may enhance therapist fidelity and competency, resulting in better client outcomes. Initial experience suggests that RRT technology is robust, well-received by trainees, and results in rapid skill acquisition. Anecdotal reports suggest that RRT can reveal misapplications that were not apparent in many hours of telephone consultation.

Although these consumer satisfaction findings are encouraging, it remains to be seen whether RRT will prove to be cost effective relative to PC. An ongoing larger scale project will examine client outcome, trainees' fidelity to PCIT treatment protocols, and trainee's PCIT competence (e.g., reliable coding of behavioral observations and coaching expertise) while further examining consumer satisfaction. Online RRT consultation is initially more expensive than phone consultation, but if it brings PCIT trainees to a high level of treatment fidelity and clinical expertise that results in improved client outcome or more rapid therapist mastery, it may prove to be a valuable new method of training in PCIT. Telemedicine has made major contributions to rural medical care; we hypothesize that it can make similar contributions to scaled-up implementations of evidence-based psychosocial models like PCIT.

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