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# Telephone Management in Substance Abuse Treatment

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## ABSTRACT

The purpose of this article is to describe the results of a clinical trial in which telephonic case management was evaluated as a supplement to substance abuse treatment. An interactive voice response system (IVR) was developed by the research team for use in the case management of randomly assigned participants in a clinical trial research project. The features of the software program facilitated a double caseload for the case manager as well as real-time data capture. At intake, no significant differences were found between participants in the telecommunication condition and the general project. Thus, the effectiveness of random assignment was supported. An IVR was useful for case management services, was less costly, and showed acceptability to clients. A reduction in time expenditure by using telecommunication occurred within three activity areas. Telecommunication facilitated client interaction and the use of case management, and it reduced provider time expenditure. As an alternative strategy, telecommunication case management can enhance cost effectiveness improvements.

## INTRODUCTION

**T**ELECOMMUNICATION TECHNOLOGIES are rapidly becoming an integral part of health care. The term "telehealth" is used to describe the use of information and telecommunication technologies for health care services and educational and research purposes. The automation of all aspects of information flow has combined with financial pressures to create an impetus for the innovative use of technology to augment health services in ways that are faster, span wide geographic areas, are more convenient, and are effective. Although clinicians worry that "high tech" will replace "high touch" to the detriment of the personal relationship developed with clients in traditional practice, health care delivery system pressures have brought about a serious exploration of al-

ternatives to human resource-intensive and expensive care delivery modes. The creative adaptation of technology to human services needs makes sense if it also enhances the access to and quality of care delivery.

The federal government has become aware of the explosion in the uses for technology in the telecommunications field and taken action. The Telecommunications Act of 1996 is a significant piece of federal legislation that was put into place in February of 1996 after being signed by President Clinton.<sup>1</sup> The goals of this legislation include promoting competition and reducing regulation to secure access to services for Americans. The legislation also was designed to encourage the rapid development of new telecommunications technologies. As a result, there should be a positive impact on the way consumers in rural, insular, or remote ar-

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eas acquire benefit from telecommunications and apply this to their health care needs.<sup>2</sup>

Given that technology must be used to the best advantage, one key to using advanced telecommunications and information systems for health and social services is to match the goals or information needs to the technology and not let the technology drive the application. Outcomes for selected populations may be enhanced by customizing technological innovations, which is important when trying to be cost effective while simultaneously providing quality services.<sup>2</sup>

The technology for automated information systems to manage care processes exists. What is not known is how to adapt this technology effectively to specific clinical situations. The purpose of this article is to describe the telecommunication intervention outcomes of one research project that incorporated an innovative use of technology as one strategy for case management in substance abuse treatment. It was hypothesized that the telecommunications condition would cost less and be equally satisfying to case management clients in substance abuse treatment.

## TELEPHONE TELECOMMUNICATIONS

Perhaps the most cost-effective instrument in health and social services is the telephone. The telephone was one of the earliest telecommunication technologies and is now the most widespread health care service augmentation device. For example, in nursing it is a major strategy for improving access and encouraging appropriate service utilization.<sup>3</sup> Providers can schedule visits, monitor medication compliance, suggest self-care, capture clinical data, reaffirm prior instructions, triage for medical emergencies, and reassure anxious clients, among other activities.<sup>4</sup> Telephonic systems have been used to monitor client progress in the home setting, provide early detection of complications, and reduce the costs of professional services on site.<sup>5,6</sup> These systems have been constructed as only appointment systems<sup>7</sup> or as telephonic case management and care coordination systems.<sup>8,9</sup> Thus, the telephone is a major technology for monitoring, surveillance,

and routine client care processing. However, personnel may not be available to answer the telephone every time the client thinks to call or to anticipate the times when a client should call in. A client communications system, using innovative approaches to the available telephone and computer technology, can alleviate problems and facilitate efficient services.

Two functions of a client telephone-based communications system are: (1) delegating the routing of phone calls to efficient automated functions, and (2) managing communications for clients.<sup>4</sup> Basic telephone services link clients, providers, and health care agencies with each other. Computerized documentation software can be designed both to capture care delivery in process and to streamline care processes toward greater efficiency. By using the telephone with a computerized software system and a recorded message, a balance exists between the need for frequent, redundant communications and the client's desire for the personal touch of one-to-one provider interaction.

One specific type of telecommunications system that shows promise for actual service delivery is called interactive voice response (IVR) systems. Interactive voice response systems are an emerging technology for automated acquisition and dispersal of information. They represent the convergence of computer-automated interviewing with touch-tone telephone service.<sup>10</sup> IVR systems constitute a major improvement over previous methods in the processes of obtaining and managing data. Touch-tone telephones facilitate 24-hour data collection. They override previous limitations created by distance or temporal availability of staff. Automatic data collection can be done by computers to eliminate errors due to transcription or interviewer mistakes and facilitate optimal data management procedures. Also, with 24-hour accessibility, IVR programs can provide customized services such as client-specific information, self-help treatment, encouragement, reinforcement, and support on client demand.<sup>10</sup>

The advantages to IVR systems include more accurate data capture. Knowing that a client is interacting with an IVR system can result in information that is used to tailor future interac-

tions.<sup>10</sup> Further, many individuals will feel more comfortable disclosing sensitive information to a computer rather than to another person.<sup>11</sup> Because an IVR program permits such interaction from the safety of an individual's own environment, some of the most socially stigmatizing issues such as sexual abuse, HIV risk-related behaviors, and alcohol and drug abuse might be amenable to IVR-mediated screening, assessment, and therapy.<sup>10</sup>

The major problem facing expanded communication is privacy and security. To provide quality client communications, the information must be correct and the communications systems must be secure. Confidentiality, reliability, integrity, and availability all need to be assured for that to happen.<sup>4</sup> With increasing use of telecommunications to deliver services, the quality and security of electronic information that is created, transmitted, and stored as a result of health and social services become pressing issues.<sup>12</sup> With IVR systems, the advantage is that confidentiality can be protected through the use of personal identification numbers and passwords.

## MATERIALS AND METHODS

An interactive voice response system was developed and used by the Iowa Case Management Project (ICMP) research team as one intervention in a case management clinical trial. The ICMP was a research project using clinical trials methodology to evaluate four case management conditions: one control and three experimental groups. The four conditions of case management were: (1) two ICMP case managers who were located within one drug treatment agency (called "inside"), (2) two ICMP case managers who were located in an independent social service agency (called "outside"), (3) one ICMP case manager who was located at the project research office and used the Iowa Telecommunications System (ITS) to facilitate case management service provision (the telecommunication intervention), and (4) a control condition in which clients received the standard treatment services from their primary drug counselors in the inpatient with follow-up drug treatment facility.<sup>13</sup>

All five ICMP case managers used a strengths-based counseling approach as a supplemental service for clients in substance abuse treatment. This model was primarily based on traditional social casework and can be described as comprehensive case management that included counseling and outreach. Case managers offered a broad range of assessment, problem solving, planning, and referral services. Case managers worked with each client for up to 1 year following intake to the drug treatment program. The goals of Iowa Case Management included the following:

1. Clients will decrease or cease drug use.
2. Clients will improve their health, mental health, legal status, occupational status, and other areas of their lives.
3. Clients will develop new areas of interest in their lives and develop better relationships with others.
4. Clients will lead more fulfilling lives, learning to see themselves as competent and as having strengths to build on.
5. Clients will develop positively oriented goals and work with their case manager to operationalize solution plans to achieve them.
6. Clients will learn problem solving and solution planning techniques in order to undertake future work on their own.

The first two conditions in the research design evaluated the impact of organizational location of a face-to-face case manager. Case managers were located either inside the drug treatment agency or outside of it at another agency or location. These results are described elsewhere.<sup>13</sup> A variety of client demographic and treatment outcome variables were tested across conditions and client groups. Case management was related to positive outcomes in both improvement in psychological functioning and in employment as measured by days of work. Preliminary results indicated a positive impact of case management on family relationships and the perception of social support. The preliminary results also indicated that, for the telecommunication condition, there were significantly ( $p = 0.027$ ) fewer days of psychiatric problems, clients worked 4.99

( $p = 0.005$ ) more days at their employment at the follow-up time period, and clients reported liking the 24 hour per day availability of this system.<sup>13</sup> There is some indication also that the face-to-face case management conditions may have been a perceived or actual time and effort burden for clients because they had greater attrition rates than the telecommunication and control conditions.

In the third experimental condition, an innovative application of advanced computer technology was included to evaluate the effectiveness of the ICMP approach by using the ITS. The ITS was designed to supplement case management services by providing an easy and reliable means of communication between the ICMP telecommunications case manager and his clients. Through its sophisticated voice mail capabilities, the system was designed to reduce the amount of time spent by case managers on missed phone calls, thus enabling them to spend more time on other activities. Given the projected time savings, the research design included the assignment of a double case load for the ITS case manager as compared to case managers in the other three conditions.

The ITS was comprised of a voice mail system that operated on a Gateway 4DX2-66 personal computer. A single standard phone line came into a telephone card installed in the computer, and multiple voice mail boxes were created. For example, some of the features were a voice mailbox, topic of the week function, and a suggestion box.

The ITS was designed for ease of use by clients and featured both local and toll-free (800) phone numbers that could be accessed using any touch-tone telephone. Each client in the telecommunications treatment condition was assigned an account number and password. When clients dialed the system, they were greeted and asked to enter code numbers. Upon successful entry, the system greeted the client by name and played any general or personal messages that were in the client's voice mailbox. After listening to these, the client could select from the ITS main menu. These included reviewing old personal messages, leaving a message for their case manager, transferring to the case manager's office phone, listening to the topic of the week, leaving a new

answer to the topic, leaving a suggestion, and changing their password.

#### *Voice mailbox*

A main feature of the telecommunications system was a private voice mailbox for each client. This option was especially helpful with those clients who did not have a telephone or a reliable place to leave a message. Each active client was encouraged to begin calling the system on a regular basis.

#### *Topic of the week*

The topic of the week was a voice mail function where each client could respond to a question or topic designed to promote and reinforce strengths-based thought processes. The topic was updated weekly by the case manager and was created with therapeutic intent or with relevancy to current events in his or her client's lives. In addition to responding to the current topic, clients had the option to hear responses to the prior week's topic. Responses were monitored for appropriateness and assessed for possible intervention by the case manager before they were included in this recording.

#### *Suggestion box*

The suggestion box was a location within the voice mail system accessible to every client. One purpose of this box was for clients to provide suggestions regarding weekly topic questions for the group discussion box. In addition, suggestions regarding telecommunications case management in general could be made.

#### *Other features*

The system incorporated several other useful features. First, new messages were immediately played for clients upon system entry. This eliminated the need to navigate several menus to get at the most important feature of the system.

Second, clients could connect directly with their case manager from the system. The system would dial the case manager and transfer the call if the case manager was available. Third, the caller could immediately reply to messages after hearing them, rather than hav-

ing to navigate menus to the "leave a message" area. Finally, the caller could skip past new messages at the beginning of the session if he or she felt a need to immediately access other areas of the system. From a research standpoint, the system featured real-time automatic data capture of transaction activity.

## RESULTS

During the time period of October, 1995, to December, 1998, a total of 1553 clients in drug treatment were invited to participate in this study. Of this total, 909 volunteered to participate in the research. One-fourth ( $n = 230$ ) were randomly assigned to the telecommunication condition. This condition was structured to use only one case manager as opposed to two in each of the other experimental conditions.

The participants in the telecommunication condition were 60% male ( $n = 138$ ) and 37% female ( $n = 86$ ), predominantly Caucasian ( $n = 195$ ; 86%), 32 years of age on average, and 51% had a G.E.D. as the highest level of education completed ( $n = 117$ ). Participants were predominantly cohabitating ( $n = 106$ ; 47%). Only 13 (6%) had never married, and 32 (14%) were married. They had a wide variety of living arrangements outside of treatment. One-half were unemployed. The majority ( $n = 121$ ; 53%) did not have a valid driver's license nor did they have an automobile available for use ( $n = 144$ ; 63%). A profession, trade, or skill was identified by 56% ( $n = 127$ ) of participants. Seventy participants (31%) reported an annual income of \$10,000 or more, with only 28 of these 70 (13%) reporting income of \$20,000 or more per year. The mean annual income was \$8706, with the median being \$5000. Multiple substance use was reported by 65% ( $n = 138$ ) of participants. For those reporting single (not multiple) substance abuse, alcohol was the most predominant substance used ( $n = 186$ ; 82%), with marijuana ( $n = 129$ ; 59%), cocaine ( $n = 83$ ; 39%), amphetamine ( $n = 64$ ; 30%), and barbiturate ( $n = 7$ ; 4%) use being reported.

The participants in the telecommunication condition closely resembled the overall population ( $n = 1553$ ) from which the ICMP research participants were drawn. The overall

population was 33% ( $n = 576$ ) female, 83% ( $n = 1446$ ) Caucasian, and an average age of 33. The telecommunication condition participants also closely resembled the aggregate group of 909 volunteer research subjects, who were 40% ( $n = 353$ ) female and 83% ( $n = 756$ ) Caucasian. One-way analysis of variance (ANOVA) of the four treatment conditions yielded no significant differences for age, race, or marital status. Thus, at intake, the random assignment of participants was effective to balance the profile of demographic characteristics among the four conditions.

Two important program outcomes that were evaluated were cost and client satisfaction. In this study, the telecommunications condition cost 50% less in the major cost category of case manager labor costs (salary plus benefits). In the telecommunications condition, the one case manager's efforts were augmented by technology to manage a double caseload. Additional costs for technology would include the computer equipment, a regular telephone line, and the start-up cost of software and programming time. Although access to a telephone is an issue for many substance abuse clients, in this study clients were able to access the 800 number on any public phone so that access did not appear to be a barrier.

Client satisfaction was measured by the 35-item Consumer Satisfaction with Case Management Services Scale, which was given at each client follow-up. This scale is a case management-customized version of the Consumer Satisfaction with Social Services Scale of Reid and Gundlach.<sup>14</sup> This scale contains subscales for relevance, impact, and gratitude dimensions. Reid and Gundlach<sup>14</sup> reported high face validity and good reliability for their scales ( $r = 0.96$ ).

Significant differences were found among the four treatment conditions on relevance, gratitude, and overall mean item scores on oneway ANOVA. Post-hoc Bonferroni analyses revealed that telecommunications clients were significantly more satisfied with perceived relevance than were outside case management clients, but they were less satisfied about the relevance of case management than were those in the standard condition who received no extra services. An examination of the actual ques-

tions asked on the relevance subscale ( $n = 11$ ) suggests that case managers (inside) and regular treatment staff (standard condition) who were associated with the substance abuse treatment facility environment were perceived as the most able to be helpful with important problems (relevance). It is possible that face-to-face interaction is important for some clients and more important during specific phases of the treatment process. Furthermore, because ease and comfort with the case manager (perceived gratitude) were positive aspects of the telecommunication condition, it appears that clients liked to use this system, but refinements may be needed to match services better to perceived needs. For example, social support was a key feature of one telecommunication technology project for chronic illness management.<sup>15</sup> For perceived gratitude, the telecommunications clients scored significantly higher than those in the standard condition.

For the substance abuse treatment client, the inside case manager condition provided enriched services over the standard services, with a case manager who was on-site at the treatment facility. Thus, the case manager was easier and more convenient to find and access while the client was in treatment. Following treatment, the client might find it easier to talk with an outside case manager if there were disagreements with the treatment center or if the client wished to be disassociated from any connection to the treatment program. The features of the telecommunications condition were very different from the two (inside and outside) face-to-face conditions in the provision of potentially less human interaction and the perception of greater identity shielding.

On the overall client satisfaction mean score, telecommunication clients were significantly more satisfied than the outside case management clients, not significantly different from the inside case management clients, and less satisfied than the standard condition clients. Although client satisfaction results were mixed, in general, the telecommunication strategy for case management demonstrated greater relevance and general satisfaction over using provider-intensive case management through an outside social services agency. Of the three experimental conditions that provided

enhanced strengths-based case management services (inside, outside, and telecommunications), no differences in client overall satisfaction were detected between inside and telecommunications strategies. Because the telecommunications condition was 50% less expensive for labor costs, this strategy can be recommended as less costly and equally satisfactory to clients while potentially enhancing access to services. A similar acceptability of telemedicine for mental health visits despite fears of being too impersonal was found by Callahan, Hilty, and Nesbitt.<sup>16</sup> Telecommunications strategies are one tool for use in case management services.

## DISCUSSION

The telecommunication condition saved money because the case manager carried a double caseload in the ICMP project and used the ITS to facilitate communications with clients. The purpose of this caseload difference was to test the effectiveness of a condition that is a hybrid of social service case management and managed care. Although the ideology, function, and clinical technique of the telecommunications case manager was the same as the other experimental conditions, the telecommunications condition reduced the time spent in three activity areas for greater cost effectiveness. First, the use of the ITS improved efficiency by reducing time wasted on missed communications. Second, in contrast to the one-on-one therapy conditions, the telecommunications case manager conducted all but three initial client contacts over the phone (ITS), rather than in person. Finally, the telecommunications case manager did not provide transportation for clients, whereas in one experimental condition the case manager did. Transportation is an urgent need for many clients with limited resources. However, it is a labor and time-intensive strategy.

The client satisfaction data support the acceptability of telecommunications case management. Some clients may prefer this strategy over face-to-face follow-up services. Telecommunications strategies show promise for extending access to services, especially in remote

or rural areas. The limitations of this study include the study population being drawn from one state and including only treatment clients who volunteered to participate. Furthermore, the results need to be interpreted with the caution that the clinical trials conditions were confounded by the influence of the individual personal qualities of the counselors. The general likeability, ability to establish a therapeutic relationship, enthusiasm, and ability to engage clients' motivational structures vary by individual case managers and may have affected the results. However, these qualities also vary among counselors and thus would be expected to be found as well in the standard condition substance abuse treatment program.

### CONCLUSION

The investigation of alternative strategies to provide services without labor intensity has focused on telehealth technology as one answer to the problem. Cost saving measures such as the ITS technology and a telecommunications case management strategy show promise to improve the cost effectiveness of the delivery of services to clients in substance abuse treatment and follow-up.

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