Computer-Supported Distance Art Therapy: A Focus on Traumatic Illness

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This paper contains a description of the preliminary stages of the development by the two authors of a computer system and basic procedures for computer-supported distance art therapy. We discuss this innovative form of telehealth within the context of psychosocial care for people with traumatic illnesses, particularly cancer. The paper includes a rationale for developing distance art therapy services for people who have traumatic illnesses, a general description of computer-supported distance art therapy, and a technical description of the computer system we have created.

In this paper, the term art therapy is used inclusively to mean therapeutic art, art as therapy, or any kind of therapeutic intervention during which the client makes art images. We use the term traumatic illness to refer to illness that either is life-threatening or is chronic in that it cannot be cured, significantly influences everyday life, and necessitates assistance or treatment by others (Reid, 1984).

The first author, Kate Collie, is an artist and a counselor with a special interest in therapeutic art groups for adults with traumatic illnesses. The second author, Davor Ćubranić, is a computer scientist with a specialty in human-computer interaction and background experience in the area of computer technologies for people with disabilities. By working together, we were able to create an art-based form of telehealth that is relatively inexpensive and is congruent with current trends in health care.

Computer-supported distance art therapy makes it possible for group art therapy sessions to take place when the clients and the therapist are all in different places. The computer system we created for this supports communication by speech and shareable hand-drawn images. Although the system has both audio and visual dimensions and therefore has more scope than telephone or e-mail services, it can be handled by the current generation of home computers with modem access to the Internet.

The rationale for developing a computer-supported distance art therapy service
for people with traumatic illnesses relates to Kate’s clinical interests and is in accordance with a preliminary evaluation of computer-supported distance art therapy (Collie, 1998; Collie & Ćubranić, 1999). The evaluation showed that computer-supported distance art therapy has potential for people who have mobility limitations—as many people with traumatic illnesses do—or who prefer to have extra privacy.

The use of art as therapy in medical settings can be traced back at least to the 1930s (Rosner-David & Ilusorio, 1995). Currently, therapeutic art activities are used in the care of people with cancer and other traumatic illnesses in North America and elsewhere (e.g., Breslow, 1993; Field, 1976; Pinchover, 1998; Siegel, 1989) and are thought to have both preventative and curative influences (Taylor, 1999). Many ideas have been put forward as to why art making may be beneficial for people with physical illnesses. In discussing the care of people with HIV/AIDS, Aldridge (1993) claims that expressive arts therapies are useful for integrating the physiological, psychological, social, and spiritual domains during traumatic illness and especially for restoring hope. Piccirillo (1995) claims that art making facilitates crucial non-linear processing of “the complex constellation of thoughts, feelings, and conflicts” (p. 25) that accompany HIV/AIDS.

A patient’s sense of control is known to be an important factor in adjustment to illness (Helgeson, 1992; Reid, 1984; Taylor, Helgeson, Reed, & Skokan, 1991). Reid has shown that for people experiencing chronic illness, a destabilizing sense of loss of control in one area can be compensated for by developing a sense of control in another area. Art therapy can be useful for enhancing perceptions of control during illness (Breslow, 1993). Clients have control over the art materials and the art images, they experience their own creative power, and they have control over their creative production. When art images contain difficult emotional material, this material can also be experienced as controllable by being contained within the art work.

Our rationale is further derived from four current trends: (a) the aging of the North American population, (b) a shift of focus in the field of telehealth, (c) an increase in psychosocial treatments for people with traumatic physical illnesses, and (d) the recent burgeoning of the art and healing movement.

An Aging Population

As the “baby boom” generation moves into retirement and old age, the average age of people in North America will increase steadily (US Bureau of the Census, 1997), with people 65 and over reaching 20% of the total population by 2050 (compared to the current 13%), and those 85 and over more than tripling in size between 1993 and 2030 and more than doubling between 2030 and 2050, reaching 5% of the total population (US Bureau of the Census, 1995).

The likelihood of becoming seriously ill increases with age, and therefore a higher percentage of the population will need medical care that ever before (Kimmel, 1990). Concurrently, the ratio of physicians per capita will decrease as the baby boom physicians retire. This decrease in the number of physicians per capita has already begun and is especially noticeable in rural areas (Watanabe, Jennett & Watson, 1999). New approaches to health care are required, particularly approaches that emphasize self-care.
Telehealth

Telehealth is being promoted as a solution to the problems just described (Watanabe, Jennett & Watson, 1999). Telehealth refers to the use of telecommunications technologies to increase availability of health care by making it possible to access services from a distance. People living in rural or remote areas are expected to benefit from telehealth, as are the elderly, people who are home-based or home-bound, people outside the cultural mainstream, people in lower socio-economic groups, and people with disabilities or disabling illnesses (Brauer, 1992; Sampson, Kolodinsky, & Greeno, 1997).

Telephones and radios have been used for many years to aid in the delivery of health care (Cervinskas, 1984). Recently, the advent of the Internet has caused a renewed interest in distance health care and has been a catalyst for rapid growth in this area (Lugg, 1998). Videoconferencing, e-mail, and interactive websites are some of the forms of distance delivery currently being explored as ways of making both physical and mental health services more readily available.

As telehealth has expanded in the last decade, expensive technologies--such as high-bandwidth lines, satellites, and powerful computers--have been used to reach toward the goal of full-speed two-way video communication for distance delivery of health care services. Although preliminary studies of distance mental health programs that have employed complex technologies have shown promising results (e.g., Doze, Simpson, Hailey & Jacobs, 1999; Mannon, et al., 1998; Mielonen, Ohinmaa, Moring & Isohanni, 1998), it is not clear that high-tech telehealth can be cost-effective (Brown, 1995; Lugg, 1998). Attention is now moving to less technologically complex methods of telehealth delivery (Della Mea, 1999; Grigsby & Sanders, 1998).

Psychosocial Medical Care

Cancer is one of the most common traumatic illnesses in North America and is currently the second most common cause of death in the US (Maguire, 1999). Therefore, trends in the treatment of cancer may give some indication of overall trends in health care for people with traumatic illnesses. Psychosocial treatments are starting to be a regular part of care for people with cancer, as the benefits of preventative behavior change are being recognized and as increased attention is given to the quality of life of cancer patients, cancer survivors, and their families (Maguire). Psychosocial care for people with cancer typically takes the form of education and group support, as well as counseling to help with such things as decisions about treatment options, management of pain, side effects of medications, and the chronic stress a life-threatening illness can cause (Baum, 1999). Psychosocial interventions that focus on education, adjustment, and coping translate readily into self-care.

The Art and Healing Movement

The belief that art making can be healing and life enhancing is one of the fundamental tenets of the art therapy profession. Recently, the idea that art can be used to promote wellness and ameliorate illness has also been embraced by artists and health care practitioners (Malchiodi, 1998). The Society for the Arts in Healthcare, The International Arts Medicine Association (www.members.aol.com/iamaorg), and The Arts and Healing Network (www.artheals.org) are examples of organizations that have recently been formed to promote the arts as an integral component of health care.
Arts programs are being established in hospitals and other medical care settings. In some cases, the purpose of these programs is simply to use art and music to create comforting environments (Kaye & Blee, 1997). There are also artist-in-residence programs, such as the Arts and Healing Program at the Palmetto Richland Memorial Hospital in Columbia, South Carolina (www.palmettorichland.edu), that are designed to make art activities available to staff and families as well as to patients. The Healing and the Arts program at Dartmouth Medical Center (www.koop.dartmouth.edu) is an example of a comprehensive hospital arts program in which art activities are used to build more effective doctor-patient relationships, support the healing process, enhance medical education, and promote good health habits (Malchiodi, 1998).

Computer-supported distance art therapy fits with the four trends described above. It is a low-tech form of telehealth that can be used to expand to expand access to services that are usually only available in urban centers. It fills an obvious niche as a form of psychosocial care for people with traumatic illnesses, for whom the costs and strain of traveling to receive care can significantly limit the benefits--making distance delivery especially important.

Developing Computer-Supported Distance Art Therapy

The system we have developed for computer-supported distance art therapy can support either individual or group art therapy sessions. We chose to focus on group art therapy out of consideration for the isolation that can be a consequence of traumatic illness. We wanted to make it possible for someone with mobility limitations to be able to access psychosocial treatment--in this case art therapy--and to have contact with other people having similar experiences. We designed the system so a group of people in different places can talk with each other through their computers and make computer drawings that the other people can see on their screens. This is human-human interaction using computers, with a human-computer interaction component that is deliberately minimized so that the human interaction can be maximized.

As far as we know, we are the first to develop a computer system specifically for distance art therapy. There were two main development tasks. One was to create a user-friendly computer system that could support audio and graphic group communication, and that would be suitable for standard home computers with dial-in access to the Internet. The other was to develop appropriate procedures for conducting distance art therapy sessions with the system. We drew on literature about telephone therapy (e.g., Haas, Benedict & Kobos, 1996; Rittner & Hammonds, 1992), computer-supported collaborative work (Grudin, 1994), e-mail therapy (e.g., Murphy & Mitchell, 1998), computers in art therapy (Canter, 1989) and computer-mediated communication (Chesebro & Bonsall, 1989) for guidance in our development decisions.

We used as a template the face-to-face format Kate uses for therapeutic group art activities with people with traumatic illnesses. The configuration is one in which a group of clients and a therapist sit around a table with pastels, markers, crayons, and watercolor paints within easy reach--simple art materials that favor directness and immediacy and require no training to use. The first session of a six-week group begins with a warm-up activity designed to build group cohesion and to foster confidence about art making. An example is “pass-the-drawing”, an activity in which each person begins a drawing, then after a minute passes it to someone else who continues drawing, and so on until everyone
has contributed something to each image. In subsequent sessions, the art therapist/facilitator guides the group through more complex art activities that are done individually. The therapist/facilitator talks intermittently throughout the activities and glances around to see how things are going--without looking closely at what people are drawing or painting (allowing some privacy). Group members are aware of other people making images, and typically feel supported and encouraged by the group. They can also glance around without interrupting anyone. At the end of each activity, the group looks at what the others have done by standing up and walking around the table. When it is time for the group to discuss the art images together, the images are either put up on a wall or laid out on the floor in sequence.

Participatory Design

The initial stages of the development process were structured as participatory design, a broad set of design practices that all have in common direct and effective user participation in system development activities and decisions. It is a philosophy that first took root in Scandinavia, as part of the workplace democracy movement; the first applications of participatory approaches to computer systems development took place in the 1970s in Norway (Ehn & Kyng, 1987), followed shortly by similar efforts in Sweden and Denmark (Clement & Van den Besselaar, 1993).

The prevalent view of software development as a form of production--with a rigid structure, focus on formal definition documents, and a program’s quality defined primarily by its conformance with those documents--is in marked contrast with participatory design approaches. These approaches view software development as an exploratory activity that includes end users as an integral part of the design team, emphasizing prototyping, experimentation, and user empowerment (Floyd, Mehl, Reisen, Schmidt, & Wolf, 1989). In participatory design, users actively engage in designing the systems they will eventually employ. Three reasons for having user participation in design are often given (Bjerknes & Bratteteig, 1995): improving the knowledge upon which systems are built, enabling people to develop realistic expectations while concurrently reducing resistance to change, and increasing workplace democracy by giving the members of an organization the right to participate in decisions that are likely to affect their work.

The focus of participatory design is not only the improvement of the information system, but also the empowerment of workers so they can co-determine the development of the information system and of their workplace (Clement & Van den Besselaar, 1993). Two themes govern practical implementation of participatory design principles (Floyd & al, 1989). The first theme is mutual reciprocal learning, in which users and designers teach one another about (respectively) work practices and technical possibilities through “joint experiences”. The second theme is design by doing, in which interactive experimentation, modeling, and testing support “hands-on design” and “learning by doing”. An important aspect of participatory design is what Ehn (1988) calls the “balance between tradition and transcendence”. In participatory design, new technology explicitly incorporates the history of how work has been done in the past while simultaneously improving how work can be done in the future.

There were three phases to our participatory design process. The first was the
preliminary collaboration between the two authors, when we learned the possibilities and limitations of each other’s field and determined initial parameters for a distance art therapy system. When we had a usable prototype, we worked with groups of volunteer testers to determine what kinds of communication the system could support and to identify therapeutic art interventions it could handle.

During the final stage of the participatory design process, a team of 10 potential users experienced simulated distance art therapy using the system--they took the role of clients, Kate led the sessions--and afterwards participated in round-table discussions about the possibilities and problems of computer-supported distance art therapy (and related forms of distance care).

The 10 people on the team were counselors, art therapists, and educators, each with at least one area of personal or professional experience directly related to computersonspported distance art therapy. These included computer science, ethics of Internet counseling, distance art therapy, computer art, rehabilitation counseling, e-mail therapy, and support services for people with cancer. At least three of the 10 have lived with life-threatening illnesses and two use wheelchairs.

The group discussions were audiotaped and the transcriptions analyzed to identify key issues that were raised. The purpose was to lay a conceptual foundation for this and other similar telehealth systems. Suggestions made by the team were used to improve the system between sessions and to refine the communication procedures we were using. For a detailed discussion of the issues that were explored by the participatory design team, see Collie (1998) and Collie and Čubranić (1999).

System Implementation Details

The system provides support for five tasks: speaking within the group, drawing, passing drawings, maintaining awareness of other group members’ activities, and showing drawings to the rest of the group. Davor did this by creating an art program specifically for art therapy and combining it with a pre-existing communication program.

The system described here was developed on Silicon Graphics’ Indy workstations, but runs on any machine running a POSIX-conformant Unix operating system and X Window System Version 11 Release 5 (for example PC’s with Linux).

Audio communication. Our system had to support two modes of communication: verbal and visual. Distance verbal communication in our case required conference call-like audio connection between the participants. In practice, if clients’ dial-in lines turn out to have too small a bandwidth, this could be done by telephone, although it would require the addition of a second phone line to their location.

In this instance, since the workstations were already networked via a local area network to transmit visual information, it made sense to use the network to transport the audio as well, especially since there was more than sufficient bandwidth available. This scenario is likely to be feasible even in the real world, with the constant improvements in the speed of communication lines available to a home customer; besides, modern audio streaming programs such as RealAudio and NetMeeting can run comfortably even in today’s conditions.

There are numerous programs that have network audio conferencing capability, and we decided to use Silicon Graphics’ InPerson, which was pre-installed on our development platform and offered everything we needed.
The paint program. Visual communication at the minimum required some sort of drawing surfaces that can be viewed by all the participants. Group painting programs are quite common groupware applications; however, despite several such programs being available both for free and commercially (including a component of InPerson), none of them quite suited our needs and the special requirements of art therapy. Therefore, we decided to write our own, based on XPaint, a publicly available single-user paint program for UNIX and the X Window System platform (home.worldonline.dk/~torsten/xpaint/). Davor followed Kate’s specifications and made a program that is simple, naturalistic, and aesthetically pleasing. The program supports freehand drawing with a wide range of colors and is maximally simplified for intuitive use.

The user interface. A major goal in the program’s design was to keep it intuitive and easy to use. We wanted to augment the enhanced feelings of control that therapeutic art activities can bring by making it easy for clients to experience a sense of mastery and control over the computer. For this reason, the user interface has no complex commands and arcane features, and all the available operations are immediately visible. Similarly to standard paint programs, there is a small “toolbox” (brush, marker, pastel, spray paint, eraser, color-matcher, and pointer) at the side, and a large drawing space filling most of the computer screen (see Figure 1). A new drawing space can be created at any time with one mouse click. This is one of the ways in which the paint program is more straightforward than traditional art materials; the ease of “mixing” colors is another.

The system is very responsive to hand-drawn marks and can show a great deal of artistic nuance, and yet it does not require a high level of manual or cognitive functioning. It is usable by someone with limited dexterity or by someone who is fatigued or dulled by medication. The drawing can be done with whatever input device (mouse, track ball, stylus) that the person prefers.

System architecture. The system was implemented as a fully replicated architecture with the paint and audio-conferencing programs running on every participating workstation. As a person draws, the information that makes that picture is transmitted to all the other computers on the group. This information is transmitted as individual user actions, such as mouse clicks and strokes, rather than as whole images, so that the required network bandwidth can be kept relatively low. The system is composed of participating computers running the paint program, which in general correspond to a therapist and clients in a therapy session. The therapist’s program starts first and accepts connections from other participants. It also serves as a sequencer of drawing events in the system—all participants’ events are relayed to it and then broadcast to the rest of the system, ensuring the same sequence of events on all computers. Thus, participants’ programs do not usually communicate directly with each other at all, although each one knows who the others are. This is useful in the event of the failure of the sequencer, in which case a simple software re-election algorithm determines a new sequencer among the remaining participants. Late-comers, and participants who were dropped out of the session because of a network or software failure, can (re)join a session in progress, in which case the sequencer automatically takes care of notifying the rest of the participants and sends out requests to the controller of each open canvas (see later) to bring the newcomer’s state up to date with the rest of the system.

The paint program itself consists of two concurrently running processes: a
communication module and a paint module. The reason for this was to keep the painting component of the program as unaware of session management and information broadcasting details as possible. All it needs to do when it wants to notify other session participants is to pass the information packet to the communication module which then takes care of the rest. The communication module also takes care of session management issues: late-joins, drop-outs, re-election, etc., and only sends to the paint module the information that it really needs (for example, names of the participants, because they are displayed in window titles).

Commonly, group painting programs (Bly & Minneman, 1990; Greenberg & Bohnet, 1991) are conceptual equivalents of a shared whiteboard where users most often work together on a single drawing. In group art therapy situations, however, each participant draws on his or her own piece of paper (canvas). For this reason, this system does not implement simultaneous painters in a single canvas; while everybody may look and “point” at a canvas at any time, there is only one owner (controller) that may paint in it. However, each canvas is displayed in a window on each participant’s screen, and control of a canvas can be passed to somebody else, as, for example, in a “pass-the-drawing” exercise.

Awareness support. Existing groupware systems often present a miniature view of other participants’ windows to maintain a sense of workspace awareness. In our case, because the activity consists of longer periods of individual work followed by group discussion, we found that constantly seeing others’ work underway in the background was distractive. We sought a way to maintain a sense of group activity, but minimize distraction, and found that having canvases opened by others lined up as icons along the top of the screen, together with the spoken dialog on the audio channel, was sufficient for this purpose. On the therapist’s workstation, however, the images by default remain fully visible so that the therapist can see them as they are being drawn. When it is time to discuss everyone’s images together, the iconized images can be opened with a single click.

We eventually decided not to include small video images of the therapist/facilitator and group members on each person’s screen because this would surpass the capabilities of most home computers. Although there is evidence that at least some video contact could be helpful (Rocco, 1998), it is not clear that it is necessary or that it would always be beneficial. Stein, Rothman and Nakanishi (1993) found that members of a telephone group for people with multiple sclerosis were opposed to exchanging photos of each other and put high value on remaining unseen. Our decision not to include video is supported by research indicating that people using computer networks to do collaborative work adjust their communication according to the medium, by focusing on what is most important when there are fewer channels of communication (Vera, Kvan, West, & Lai, 1998).

Art Activities for Distance Art Therapy

Although we designed the system to support a wide range of therapeutic art activities, those that worked best were ones that allow, or require, the therapist/facilitator to talk while the members of the group make art images. We discovered that it was important to limit periods of silence, as awareness of the group and group connectedness hinge largely on speaking. The participants reported feeling uncomfortable during
periods of silence, and during silences it was hard to know if the connections between the computers were intact. Kate found it worked best to talk intermittently and steadily to the whole group during the art activities and to talk occasionally to individuals as well, to confirm their presence and to reinforce the inclusion of all group members.

Kate works with a narrative therapy framework (Freedman & Combs, 1996; White & Epston, 1990) and the art activities we used during the simulated sessions were based on the narrative therapy ideas of increasing the sense of personal agency and enhancing awareness of personal resources. Two examples are: (a) an “empowerment” activity in which people are asked to imagine feeling the kind of personal strength they like to feel and to use this as a starting point for creating an image; and (b) an intuitive drawing activity that is followed by questions about the images that are answered privately. The empowerment activity is designed to build confidence and to demonstrate that a sense of competence and agency can be accessed deliberately. The intuitive drawing with questions lets people see themselves as creative and capable of making original and meaningful images, and lets them experience their problems as manageable and solvable.

**Conclusion**

When we started this project, we thought the impersonal nature of computers and the lack of fact-to-face contact might make computer-supported distance art therapy impractical or even impossible. However, our experiences during these first stages of development have shown us that computer-supported distance art therapy is feasible.

The responses of the people involved in the initial participatory development were much more positive than we had expected. They reported that the system was easy to use, they engaged with it very quickly, and once they were using it they would not want to stop! They made suggestions about how to use the system in actual therapeutic settings and provided solutions to almost all the technical and procedural problems we encountered during our test sessions. For a full discussion of the problems that were encountered and the solutions that were suggested, see Collie (1998) and Collie & Ćubranić (1999).

The counselors, therapists, and educators who contributed to the participatory design process were generally enthusiastic about the potential of computer-supported distance art therapy to increase access to care, especially for people with mobility limitations and people who require extra privacy or who do not wish to be judged by their current physical appearance. These responses reinforced our idea that the time is ripe for computer-supported distance art therapy with a focus on people who are facing traumatic illnesses.

As we move forward, we will continue a parallel development of the system and procedures for using it. Two of the priorities for the software development will be keeping the user interface simple and adapting the program to a wide range of computer systems. The further development of the procedures will be done in collaboration with a participatory design team of medical art therapists and cancer patients--who will be able to provide focused input regarding psychosocial interventions for people with traumatic illnesses. We hope to create a low-bandwidth form of telehealth that is affordable, acceptable to a wide range of people, and effective in overcoming barriers that prevent people facing traumatic illness from receiving psychosocial care.
**References**


Figure 1. A screen shot from a test session showing the user interface.