Two-Way Television: Helping the Medical Center Reach Out

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Since 1959, the University of Nebraska Medical Center has been using two-way closed-circuit television for medical treatment and education, largely in psychiatry. Television has been used to link the medical center with hospitals in remote rural areas, as well as to assist in educational programs within the university complex. Electronic communication has been valuable in extending education and services.

TWO-WAY TELEVISION is not a new concept. It goes back in time beyond the current decade, in fact beyond this generation, making it nearly impossible to guess who first envisioned the tremendous potential of this tool and the promise it holds for medical education and practice.

The Bell System has promised that sometime in the 1970s the ultimate in two-way picture and sound communication will be available with the wide distribution of phonovision. It is not difficult to imagine the many conveniences in health care and education that will result.

While waiting for phonovision or its equal, the University of Nebraska Medical Center has been experimenting for 12 years with the potential of two-way audio and video transmission in medical treatment and education (1). In 1959, the Nebraska Psychiatric Institute (NPI), which is the department of psychiatry for the medical school, first used two-way television to transmit demonstrations with neurological patients and case information to freshman medical students seated in laboratories across the campus. The return television picture and accompanying sound made it possible for the instructor at NPI to relate to the students and to watch their participation and reactions.

In 1961, a grant-supported pilot study was undertaken to determine the value of two-way television in psychiatric treatment (2). Patients in group psychotherapy were seated in one room and the therapist in another. In the patients' group the therapist was present on a TV monitor. In turn, a television picture of the group was transmitted to the therapist. During six sessions conducted with each of four groups, the patients and the therapist saw and heard each other only by closed-circuit television. Four other control groups met for six sessions each using conventional psychotherapy techniques, i.e., the therapist was actually seated in the group. Analysis of rating scales of patients and of therapists showed that the choice of therapist and the selection of group members influenced the effectiveness of therapy more than the use of the TV technique. In other words, the presence of television was neither a problem nor an asset.

After this project, the same technique was used in individual therapy. A patient was treated for nearly a year, seeing his therapist only on television. Again the use of TV did not affect either the establishment of rapport between the patient and the psychiatrist or the attitude of either toward the therapy situation.

Across 112 Miles

In 1964, the National Institute of Mental Health funded an application that permitted the installation and operation for six years of a two-way closed-circuit television system between NPI at the University of Nebraska Medical Center and the Norfolk State Mental Hospital, 112 miles away. The Norfolk hospital has had many problems common to

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such isolated health facilities: difficulties in recruiting and retaining trained staff, in providing in-service training opportunities, and in taking advantage of consultation services available only in a large medical center (3–5).

The two-way television system provided face-to-face electronic communication between the Omaha and Norfolk institutions 24 hours a day every day. (The actual scheduled hours of use averaged approximately 45–50 hours a week during the six years of operation.) State hospital personnel or patients could see and hear a closed-circuit television transmission from NPI, and at the same time participants at NPI could see and hear them.

Transmission facilities and services were provided by the Northwestern Bell Telephone Company. In establishing a system of this type in a small community where there were no electronics distributors or technicians, it was important to select durable, portable equipment that was simple to operate. It was also necessary to designate one person in the institution to be responsible for the care and operation of the equipment. The state hospital EEG technician also became the television technician and was given limited training. Knowing that someone maintained the TV connection as a constantly available tool for saving work and time led the staff members of both institutions to accept the system.

The television picture and sound could originate from any of several locations at each station. A direct telephone line was available for scheduling the system and for use by the technicians during programs. A Xerox telecopier was installed at each location to transmit and receive printed matter such as patient charts, reports, and class materials.

Goals

When this two-way television project was proposed, the NPI and state hospital staff members set four specific goals: 1) improved education and training opportunities for state hospital staff at all levels, with corresponding educational benefits to the NPI staff; 2) use of state hospital resources in the teaching programs of NPI; 3) improved state hospital patient services; and 4) increased collaborative research activity.

To improve education and training many activities were initiated. Joint TV conferences were held weekly by the nursing services of NPI and the state hospital. The nursing staff members discussed common problems and participated in in-service educational programs. Staff members of the social service, psychology, and vocational rehabilitation departments held similar meetings.

Specialized courses for such groups as the clergy, general practitioners, social group work interns, and graduate nurses were telecast (6). The county medical society was another group reached by the medical center staff using the TV system.

A joint grand rounds was shared each week by the professional staff members and students of both institutions. Responsibility for content alternated between NPI and the Norfolk State Hospital. The presentations of NPI's series of distinguished visiting lecturers were transmitted by two-way television to the state hospital from the NPI auditorium.

Patient Services

Improvement in services to state hospital patients was accomplished in several ways. For example, since the state hospital did not have a staff neurologist, an NPI neurologist provided his services each week via TV. Early studies indicated that it was possible to observe reasonably detailed neurological examinations on television. EEGs could also be read quite easily with inexpensive equipment.

Consultation was also given on request in psychosomatic medicine, child psychiatry, and speech evaluation. These practices in effect increased the staff available to the isolated state hospital by making the professional staff of NPI readily available.

Because of the acute shortage of psychiatrists at Norfolk, ward administration proved to be one of the most effective uses of the system (1, 4, 7, 8). Beginning in January 1965, on a 35-bed security ward for women, an Omaha psychiatrist used two-way television to talk and work with state hospital ward personnel and patients for 30 minutes each day. His goals were to achieve better patient management by adequate medication and to change the attitudes of the ward personnel, who thought of themselves as custodians rather than as therapists. The long-distance

ward administration brought a rapid change in this situation.

As the program progressed, three NPI psychiatrists administered ten wards at Norfolk. The total inpatient population at the state hospital dropped from 900-plus in 1965 to 476 in December 1968. The state hospital administration felt that the treatment programs set up by the TV psychiatrists were certainly contributing factors in this decline (3, 9).

Patient services were also improved by using the system about eight hours each week to enable patients to see and talk with their relatives in the Omaha area. Distance, inconvenient public transportation, expense, or health and family problems frequently prevented patients' families from traveling to Norfolk, so the TV visits were important in helping the hospitalized patient remain an active member of the family.

Progress was also made toward the goal of facilitating and encouraging research. Staff members at both institutions used the two-way system to discuss their investigations, to share advice on research design, and to present research findings at seminars and staff meetings.

The Present Network

A new medical television system in Nebraska currently connects three Veterans Administration hospitals and the University of Nebraska Medical Center. The VA hospitals are in Omaha, Lincoln (55 miles from Omaha), and Grand Island (150 miles from Omaha). The switching center of the network is located at the Omaha facility. Studios at the medical center are located at NPI and at University Hospital. The system was formally established in 1968 through an agreement between the university and the VA to exchange medical information.

During 1970 this system was in use for 1,267 hours. Approximately 68 percent of the time was spent in educational activities, 25 percent in patient care functions, and seven percent for miscellaneous purposes.

In patient care, consultations with specialists in Omaha have expanded the services of VA hospitals. Many of the hospital departments use the television network for regular conferences to discuss common problems and exchange case information. The VA psychiatric services use the electronic connection with NPI for a variety of treatment and training activities.

Educational uses of the system have included psychiatric orientation of VA staff members and trainees through formal lectures and supervisory meetings with specialists, staff members, residents, medical students, and other trainees at NPI. In nonpsychiatric areas, in-service training courses for nurses have been held over television. Monthly two-way TV training conferences for ambulance drivers and other emergency care personnel drew wide participation from communities surrounding the hospitals.

Pros and Cons

The greatest advantage of the two-way television systems is obvious: They help accomplish goals. Other advantages are found in shrinking miles, in increasing the number of available staff members at participating hospitals, and in improving interpersonal and interinstitutional relations.

Of course, there are disadvantages. Some staff members at all of the institutions were at first hesitant to participate in the TV programs. In most instances a single use of the system removed this hesitation (1). In the Norfolk project, patients and relatives were most receptive to the electronic communication. Records of patient-relative visits show that only one patient, a geriatric case, found the television upsetting.

There are still technical problems to be overcome if two-way television is to be an undemanding, unobtrusive communications tool. Sound pick-up and camera operation with large groups are more complicated and require more skill from the technician than small group or individual presentations. In all person-to-person uses the equipment was unattended.

Costs must also be considered a drawback. Transmission charges between Omaha and Norfolk were approximately $48,000 a year. Had the system been used during every available hour, the service would have cost approximately $5.50 an hour. Obviously, it is nearly impossible to use such a facility on a 24-hour basis. Specialized equipment could have been added to make possible the transmission of many kinds of information in the idle hours, but in this case the added costs

were prohibitive and the demands limited.

Another possibility for lessening the financial burden would have been to share the facilities with other institutions between Omaha and Norfolk. However, this might have led to a "party-line" situation, with difficulties in scheduling and a lack of privacy.

There is no doubt that biomedical uses of common carrier television services must increase despite costs. If this occurs, an adequate network of transmission facilities will blanket the country. This should lower common carrier rates. It is also probable that other communications firms will see fit to invest their capital in such systems.

The possibility of the University Medical Center's building and operating its own microwave facility has often been discussed. In 1963, when the Norfolk long-distance project was planned, this was neither economically nor technically advantageous. Microwave engineers were not plentiful in Nebraska at that time and are still in short supply. A medical network requires a reliable system.

Conclusions

Two-way television has considerable potential for extending health education and health services beyond the confines of the medical center to local and distant institutions, clinics or community hospitals, and perhaps eventually to the physician's office, the high school counselor, or the small-town PTA meeting. Like all communications tools, it will be effective in direct proportion to the amount of careful planning put into selecting the best system, determining appropriate uses, and encouraging interest and participation, both within the medical center and with individuals, groups, or institutions beyond.

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