CABLE TELEVISION AND NEIGHBORHOOD HEALTH CENTERS: PROMISES AND REALITIES

by

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ABSTRACT

Cable television advocates argue that cable television has more to offer a city than a diversity of entertainment programming and clear TV reception. They maintain that cable, as a tool for communications and information exchange, can also be useful in the delivery of community services.

In this paper, I will consider the use of cable television in the delivery of a particular community service, healthcare, by a particular group of public institutions, neighborhood health centers.

Chapter I describes neighborhood health centers. The origins of centers in the United States, and the objectives of current centers as stated in 1960's federal legislation is outlined. The discussion then focuses on neighborhood centers in Boston, as outcomes attempting to meet the national objectives. Boston centers today have major concerns in the areas of finance, health education, staff training and patient referral.

Chapter II gives a brief history of cable television and describes the cable television plan for Boston, a plan soon to be implemented by Cablevision Systems Boston Corporation. The chapter then turns to a discussion of suggested uses of cable television in healthcare delivery, as proposed by leading cable companies in this country.

Chapter III takes a critical look at these suggested cable TV healthcare uses in the areas of health education, medical data transmission, teleconsultation and telediagnosis, and medi-alert services. The analysis of the suggested uses indicates that several factors are key to a consideration of cable TV by neighborhood health centers, and will govern to what extent centers use cable television, if at all. Broadly defined, these factors are: the matching of health center concerns and objectives with cable television services, the absolute and relative costs of implementing these services, and the technical aspects of implementation.

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Cable television advocates argue that cable television has more to offer a city than a diversity of entertainment programming and clear TV reception. They maintain that cable, as a tool for communications and information exchange, can also be useful in the delivery of community services.

This argument is reflected in the proposals of the eight cable companies which competed for the license to install a cable television system in Boston. All the companies suggested a number of cable television uses in the areas of education, healthcare and municipal services. The range and variety of uses mentioned imply that cable TV technology, with its telecommunications capabilities, can make a dramatic impact on community services delivery.

The cable television system soon to be installed in Boston is being heralded as the system which could bring these suggested uses one step closer to reality. The step is in the form of a public institutional network, consisting of schools, hospitals, municipal departments, libraries and other public and non-profit institutions, all physically linked by cable wire. The network would make possible communications among public institutions in the city. It would also provide a means by which public institutions could communicate with Boston residents who subscribe to cable television.

In this paper, I will consider the use of cable television in the delivery of a particular community service, healthcare, by a particular group of public institutions, neighborhood health centers. The discussion will focus on Boston health centers and the planned Boston cable system,

both highly regarded nationwide, the former for their present actitivies, the latter for its potential uses.

Chapter I first describes the origins of neighborhood health centers in the United States, and the objectives of current health centers as stated in the 1960's federal legislation leading to their creation. The discussion then focuses on neighborhood centers in Boston, as outcomes attempting to meet the national objectives. The last part of this chapter highlights current concerns of Boston centers today.

Chapter II gives a brief history of cable television, and describes the process leading to the awarding of the Boston license to the Cablevision Systems Boston Corporation. The Cablevision plan for Boston is outlined. The chapter then turns to an overview of the suggested uses of cable television in healthcare delivery by the eight cable companies.

Chapter III takes a critical look at those suggested cable TV uses which are relevant to the operations of neighborhood health centers, and considers these uses with regard to the objectives, operations and current concerns of Boston centers, as well as with the public institutional network. The conclusion notes those issues key to a consideration of cable television usage in neighborhood healthcare delivery.

The beginning of the neighborhood health center movement in the United States can be traced back to the urban social reform programs of the 1900's. At that time, the health problems of malnutrition and infectious diseases, and the social problems of inadequate sanitation and bad housing conditions, prevailed among poor people in the slums of newly industrialized cities. Recognizing that existing community agencies for aid and medical care to the poor were, if available, uncoordinated and inefficient, a new institution, the health center, was proposed. This institution would solve these problems through a program of illness prevention, a consolidation of healthcare and social services delivery, and the advocacy of social reforms. The center would be located in the neighborhood of its patients, thus helping to make services accessible to the poor. The participation of neighborhood members in the functioning of the center would also be encouraged to strengthen the ties between the center and the community.

The early health centers provided medical outpatient services consisting of diagnostic treatment of adults and children, immunizations, and health examinations. The centers also offered education in such areas as maternal care, nutrition, child care and hygiene. The involvement of the center's target community included the recruitment of patients by local residents. Health center administrators became advocates of such reforms as the elimination of child labor and the creation of public housing.

The organizers of these centers worked from the assumption that the healthcare needs of the poor involved not only the treatment of illness but also efforts to prevent illness. The commitment to illness pre-

vention recognized the great economic and emotional cost of acute illness to those whose poverty already placed many burdens on their survival. Preventive measures, which ranged from health education and medical services such as immunization, to attempted changes in the economic and social conditions of the urban poor, reflected the acknowledgement of societal and environmental forces on the health of low-income populations.

The first centers were financed by local taxes and philanthropy. Voluntary agencies and municipal health departments lead the way to their organization.

The decline of health centers in the 1920's and 1930's were the result of several factors, including the lack of support from the federal government and medical community, and the massive health improvements from public health measures and regulations. The advances of medical technology shifted the emphasis in medicine from prevention to curative work. The area of social work began to focus more on the individual versus the community. The many services of health centers were thus decentralized and the notion of neighborhood healthcare withdrawn from practice.

The current generation of neighborhood health centers more directly arises from 1960's federal legislation as part of the War On Poverty. This legislation expanded the early local efforts at better healthcare delivery for the poor by providing federal funding for the establishment of new, comprehensive healthcare programs.

Like the reformers of the 1900's, the legislators recognized that poverty and illness are interrelated, and that the poor lacked access to the range of medical and social services they needed for their survival. The War On Poverty suggested that an investment in the poor could improve their situation and help them contribute to the national economy.

The objectives of today's neighborhood health centers are best expressed in the 1966 amendment to the Economic Opportunity Act (EOA) of 1964. As outlined in Section 211 of the EOA, they are:

1. To serve "the needs of persons residing in urban or rural areas having high concentrations of poverty and marked inadequacy of health services."
2. To "make possible, with maximum feasible utilization of existing agencies and resources, the provision of comprehensive health services, including, but not limited to, preventive, diagnostic treatment, rehabilitation, mental health, dental and follow-up services."
3. To "assure that such services are made readily available to the residents of such areas, are furnished in a manner most responsive to their needs and with their participation, and wherever possible, are combined with or included within arrangements for providing employment, education, social or other assistance needed by the families and individuals served."

In 1968, the Office of Economic Opportunity published a set of guide-

lines entitled"Comprehensive Neighborhood Health Services Program." These guidelines identified certain elements of a health center program which would meet EOA objectives. These key elements are: a broad scope of service, accessibility, acceptability, connections with major health facilities, a health team, personal service, and community involvement.

Broad Scope of Service

The center should provide comprehensive outpatient health services (as specified earlier in the objectives) to all individuals and all members of a family at a single, conveniently located setting.

Accessibility and Acceptability

The center should be both accessible to and accepted by community members. It should seek to avoid overcrowding, depersonalized care, long waiting lines, and unpleasant physical surroundings, to name a few problems that characterize other institutions serving the poor. In order to do this, issues such as patient costs, patient transportation to and from the center, language barriers, service hours, and eligibility procedures must be addressed.

Connections with Major Health Facilities

For purposes of patient referral and the continuation of high quality care, centers should have agreements to work with health facilities providing inpatient hospital care and specialized diagnostic services.

Health Team

The idea of a team approach to healthcare enhances the comprehensive services objective. The exact members of the team may vary, but the pediatrician and internist should have a supporting staff consisting of

a nurse, social worker, health educator, community agencies and affiliated hospitals.

In addition, new support roles should be created using hired members from the target community. Trained local residents could serve as family health workers, homebound patient visitors, and community health aides. These team members could increase the accessibility of the center, and strengthen the ties between the facility and the community.

Personal Service

This guideline attempts to eliminate the problem of depersonalized care. Long-range, personalized and continuous relationships between health-care professionals and patients should be encouraged. If possible, the same health team should treat the entire family.

Community Involvement

Community involvement is considered a key mechanism to the successful function of the center in meeting certain healthcare needs of the community. Arrangements should be made so that target area residents can participate in such decisions as the precise location of the program's services, available service times, the establishment of program priorities, and employment policy. These responsibilities are analogous to those assigned to the board of directors of a voluntary hospital.

As mentioned earlier, the participation of local residents in new health roles strengthens community involvement in the health center.

The nation's first neighborhood health center funded through EOA legislation was established in the late 1960's in Boston at the Columbia Point site. Since then, 25 other centers have been created, serving 12 of Boston's 15 neighborhoods. These centers define themselves, in general, as ambulatory (meaning walk-in) health facilities delivering comprehensive quality medical care, social servicesand community-based programs to the residents of their neighborhood, particularly low-income residents. The majority of health centers are known as Independent, Free-Standing centers licensed by the state of Massachusetts. They derive their financial support from government and private grants, their party insurance payments, and sliding-scale patient fees. The other centers are license by hospitals and receive additional hospital funding.

A 1979 study of 24 of Boston's centers by the Trustees of Health and Hospitals of the City of Boston gives the most up-to-date information on the centers as a group. The study's findings describe the services, organizational structure and overall performance of local health centers.

The following outlines their key findings, as relevant to the national objectives and guidelines established by theEOA:

Broad Scope of Service

Services vary among each center, but the range of services offered by the centers as a whole reflect the commitment to provide comprehensive outpatient treatment, preventive programs, education and social services. The main services are:

Adult Medicine	Mental Health	Family Planning
Gynecology/Obstetric	Dermatology	Nutrition
Pediatrics	Eye Care	Alcoholism Treatment
Laboratory Services	Podiatry	Social Services
Dental Services	Home Care (elderly)	Speech and Hearing

All centers are located within walking distance of many neighborhood residents, and are within five blocks of public transportation.

Accessibility and Availablity

The most important way centers make their services available to patients is in terms of patient costs. First of all, centers provide services without regard to ability to pay. The centers do accept medicaid, medicare and other forms of third party insurance payments; for those without insurance, patient fees are set on a sliding scale based on family size and income. 36% of all visits to health centers are made by these "self-payors", and include those people why pay nothing for center services.[1]

Secondly, the costs of medical treatment in health centers are lower than that in other health facilities. In 1980, the average cost per medical encounter in health centers was approximately $25 per visit; similar treatment in hospital emergency rooms and outpatient departments cost twice and in some cases three times as much.[2]

Other ways in which centers have made themselves more accessible to neighborhood residents include: evening and Saturday, as well as weekday hours when services are available, bilingual staff, 24 hour telephone answering systems, and outreach to the community in the form of newspaper ads, brochures and public lectures.

Connections with Health Facilities

All centers have formal contractual arrangements with hospitals for inpatient hospitalization and medical services not provided by the centers.

In addition, health centers maintain contact with social service agencies, and arrange for the provision of social services themselves.

Health Team

The range of health center services indicates the variety of professionals and staff working in health centers. Health centers have provided training and jobs for local residents; greater than 50% of nonprofessional support staff in centers live in the community where they serve.[3]

Personal Service

The low staff turnover experienced by most centers enables patients to establish relationships with health personnel over long periods of time. However, the high use of part-time staff sometimes thwarts this goal.

Community Involvement

The operations of all health centers are overseen by a board of directors composed of all community members served by the center. The board members often bring community concerns to the attention of the center's administrators, participate in staff hiring, and decide what services should be offered.

Most importantly, the 1979 study accumulated data which can be interpreted as showing that health centers are well utilized. Between 1976 and 1979, health center visits, on the average, increased yearly by 10.5%, as compared to a 1.7% yearly increase at the outpatient departments of Boston's teaching hospitals.[4] Health center visits are believed to have grown by 23% between 1979 and 1981.[5]

One aspect of Boston health center development was not anticipated by EOA objectives. The health centers seek to make their services available to everyone. While the names of most centers identify with a community (North End Community Health Center, Roxbury Comprehensive Community Health

Center), the centers are not restricted for use by community residents. Thus, the centers do not limit themselves to handling low-income residents on a neighborhood basis, as the EOA objectives suggest.

Discussions with administrators of several Boston neighborhood health centers and with Linda Lochiatto of the Massachusetts League of Community Health Centers revealed a number of current concerns of neighborhood health centers (NHCs). These concerns are in the areas of finance, health education, staff training and patient referral.

Finance

The key concern of Boston NHCs today is their financial survival. Many of their direct funding sources are having to cut their budgets. It is anticipated that the Federal government will reduce funding to NHCs nationwide by 25% in the next three years. The passage of Proposition 2 and 1/2 will adversely affect state and local support of Boston NHCs. Local hospitals are currently reevaluating their budgets for cost containment; this could result in reduced NHC funding.

Indirect funding sources in the form of patient fees are subject to decline in the near future. Federal and state governments are considering changing the eligibility requirements of all forms of public assistance, including Medicaid and Medicare, to reduce the number of people receiving government support. This change would increase the free care population which NHCs are committted to serve regardless of ability to pay.

At this time, NHC administrators have done little planning for the coming reductions in funding. One reason for this is a lack of management expertise among NHC staff in the area of fiscal cutback planning. Administrators at several centers have said tht when the cutbacks come, non-medical services will be the first programs considered for elimination. For example, nutritional education programs for young mothers have already been dropped by the South End Community Clinic. Service redecution in the

areas of family planning, health education and mental health are expected at the South Cove Community Health Center.

To reduce the impact of the financial situation, fundraising activities and marketing strategies to attract more paying patients to centers have been suggested.

Health Education

Administrators are concerned with the delivery of health information. At times, they find their efforts ineffective. Often, staff feel they do not have the time to properly explain the many aspects of a patient's healthcare during visits with the patient. All centers offer a wide variety of health education classes, but educators complain of poor attendance. It is difficutl to measure the effectiveness of such outreach methods as newspaper ads and other printed material describing center services.

Staff training

There is concern about the training of nonprofessional staff. So far, the training of many staff members has been a time-consuming, individual, word-of-mouth process. This process takes time away from the caring of center patients.

Patient Referral

After referrring patients to hospitals for inpatient and special diagnostic services, center staff try to remain informed of their patients' condition and treatment. Currently, this is done by telephone or personal contact with hospital staff. The busy schedules of center personnel and hospital staff often result in a lack of communication about the condition of center patients.

Cable television was developed in the late 1950's as a means of improving TV reception. Until that time, clear reception on conventional television was limited to areas where over-the-air TV signals could travel directly from a TV station's transmitter to home sets. The strength of the broadcasting signal was also bounded by distance. Both obstructions in the path of the TV signal, such as mountains, and the far location of home sets from the transmitter, resulted in poor or non-existant reception.

It was thus natural for cable televison to develop in rural communities and in mountainous regions. In these areas, the cable system consisted of large antennas erected on a nearby high point, and cable wires linking the antennas to home TV sets. The antennas received the broadcast transmission directly, and then sent the TV signals to TV sets through the cable wire, thus avoiding over-the-air signal interference. Homeowners paid a small monthly charge for the cable link.

For more than a decade the relaying of broadcasting signals was the only service cable television entrepeneurs offered home subscribers. This changed with improvements made to the cable wire in terms of channel capacity.

On conventional television, there was a limit to the number of channels because the airways werecrowded with over-the-air TV, radio and official communications signals. Developments in cable technology increasedchannel capacity on a cable wire. Cable television businessmen then began to use this advanced cable to wire towns and cities where viewers wanted to receive more stations than were licensed to their

particular areas.

Until the mid-1970's, the growth of cable television was primarily in rural areas and small cities. Cable companies, which up to that time provided equipment, installation and the capacity for transmission services, then began to take an aggressive marketing approach to large cities. They started to offer extra cost entertainment packages, locally produced programming, and such services as weather reports, local news and educational programs to residential subscribers. At first, local programs were developed by the cable companies; the process became known as local origination programming. Later, local residents and organizations were allowed to air programs they developed themselves, and this process was known as public access programming.

Since the use of city streets for the wiring, both above and below ground, of cable required the permission of local governments, city franchises were sought and issued, with accompanying franchise fees paid by cable companies to the cities. Thus, cable systems gained additional attraction as a new source of municipal revenue in major urban markets.

Cable Television In Boston

In 1974, Mayor Kevin White considered the development of a cable television system in the city of Boston. He sought the advice of the Boston Consumers' Council. The Council's report recommended that the city postpone franchising for several reasons. Issues such as the current lack of community services uses on cable, restrictive federal and state regulations governing franchise fees, the expense of the technology to the home subscriber, and the possibilities of alternative communications

> "... a laudable approach given the history of cable, which is roughly analogous to that of the SST. Debates on both issues reveal an exaggerated and uncertain technology, and an indefinite market."[6]

In 1980, the Mayor again considered cable television for Boston. During the intervening years, cable technology had improved and business investment in cable increased,thus lowering costs to the home subscriber. Governmental regulations were relaxed to the benefit of cable development and municipal revenues. Several major cities installed cable systems, spurring the interests of Bostonians in cable television services as the systems gained a more urban acceptance.

Not only did the time seem right to reconsider cable, but there appeared the opportunity, in Mayor White's view, to take advantage of the still great lack of services and programming development in the use of cable television. Perhaps Boston could be the leader in innovative uses of cable television. The Mayor envisioned the development of a cable system in Boston whose organization, services and programming would serve as a model for the nation.

With this vision in mind, the Mayor and his staff evaluated eight proposals from cable companies seeking to develop cable systems in Boston. After a year long competition, the initial field of eight companies was narrowed down to a choice between industry giant Warner Amex Cable Communications Company of New York City and the much smaller Cablevision Company of Woodbury, New York. To the surprise of many industry observers, Boston awarded its cable franchise to Cablevision and not to the more experienced and financially secure Warner-Amex. This was because Cablevision

offered the more dramatic proposal, matching new approaches to cable services with the Mayor's desire for innovation in the Boston cable system.

Cablevision promised to bring to Boston the "most advanced" cable system in the nation. Its proposal highlighted three key features of the Boston system which, if implemented, would be without precedence in the history of cable:

1. The use of a cable system with 108 channel capacity on the residential network, for the provision of an abundance of programming and services to home subscribers.

2. In addition to the residential services, the development of two institutional communications networks, one for use solely by public institutions, the other by commercial institutions, capable of audio, visual and data forms of information exchange.

3. The creation, with initial support from Cablevision, of an independent, non-profit, locally-based organization to oversee public access programming and the development of the public institutional network.

The Physical System

In a typical cable system, every TV set is connected by cable to a main facility called a head-end. The head-end consists of antennas and equipment to receive and convert broadcast transmission to transmission by cable. The configuration of the cable system is analogous to a tree, where main cable lines originating at the head-end continue to branch out into smaller and smaller cable lines, ending in direct connections to individual TV sets (see Figure 1).

The advanced technology offered by Cablevision includes the installation of four main cable lines, known as a quadruple trunk, in Boston. Two of these sophisticated cable lines will together carry up to 108 channels to residential subscribers. The third line, for use by public institutions, and the fourth line, for commercial institutional use, will each have 50 channel capacity.

The quadruple trunk will be accessed from four interconnected head-end sites, making possible the reception of a wide variety of national programming as well as programming from abroad via satellite. In addition, each head-end will have its own studio production facilities for the creation of local origination and public access programs.

Residential Service Offerings

The first residential cable line, known as the Universal Basic Service, has 52 channel capacity and is being offered to home subscribers for a $2 monthly fee, the lowest charge in the indsutry. The service will carry public access and local origination channels, all local television networks, a selection of stations from outside Boston, as well as a variety of

satellite-delivered cable networks: a 24-hour news network, entertainment networks, sports networks, Hispanic language network, and a 24-hour health program network, to name a few.

The second residential cable line, known as the Omnibus Service, offers 20 additional channels of programming, several pay-per-view programming choices, and the use of simple, two-way communications equipment. The equipment allows home viewers to respond to such programs as television polls and televised shopping services with yes/no or identifying numerical answers punched on a home keyboard device similar to a TV set's remote control. Other interactive Omnibus services include video games and home security connectins with local police, fire and hospital departments.

Institutional Networks

Both the Public Institutional Network (PIN) and the Commercial Institutional Network (CIN) make possible fully interactive audio, visual and data information exchange among, respectively, public and non-profit organizations, and among commercial institutions.

It is important to note the separation of the public institutional network from the CIN and the residential network. This means that users of the PIN do not have to compete for the use of channel time with commercial users, whose financial resources often able them to outbid public sector interests in broadcast television.

Both the PIN and the CIN will be connected to the residential network through the head-ends, enabling programming to be switched from these networks to the residential services.

Public Access Foundation

The Public Access Foundation, an organization formed independently of Cablevision, will be in charge of both the development and management of public access programming and the PIN. While Cablevision is providing short-term funding of the Foundation, it is expecting that revenues acquired from users of the PIN will support the Foundation in the long run.

When asked for examples, past and present, of actual cable television uses in the delivery of healthcare, cable industry experts could cite only one example, the development in 1976 of a two-way audio and visual communications system to benefit residents of senior citizens centers in Redding, Pennsylvania. Several centers, equipped with TV cameras, microphones and TV sets, were linked by cable to a local hospital. The two-way television system provided opportunities for a center's residents to view the hospital's health education classes and participate in class discussions with hospital staff and members of other centers. The system, still in use today, both educated the Redding elderly and reduced the sense of isolatin often found among institution -bound senior citizens.

Thus, on the basis of empirical evidence, any discussion of cable TV uses and healthcare delivery is limited to this one example. This should come as no surprise, as the lack of social services development on cable was one of the key reasons leading to Mayor White's recent reconsideration of cable TV in Boston. The Mayor chose to see this situation as a unique opportunity for the city to lead the way in this area of service development.

It then seems more appropriate to focus attention on the possibilities of cable television uses in healthcare delivery. I have chosen to look at the suggested uses mentioned in the proposals of the eight companies which vied for the Boston franchise. I assumed that these companies' suggestions would represent the most current considerations of cable TV uses in healthcare delivery for two reasons:

1. The companies have first-hand knowledge of cable

technology, capabilities and practices.

2. The companies must compete against each other for city franchises. There is thus an incentive for each company to propose cable television uses which better the offerings of competitors. In the case of Boston, it was in the interest of each company to suggest uses most attractive to the local healthcare community as part of the Mayor's community services vision of cable.

Following is a list, by cable company proposal, of suggested uses of cable television in the delivery of healthcare.

Abetta Corporation

*Resource sharing among health institutions
*Two-way video for clinical use
*Inter-departmental communications

American Cablevision of Boston (ATC-Time, Inc.)

*Distribution of health education programs to patients in hospitals
*Distribution of health education programs to the well public
*Transmission of medical statistics
*Maintenance of scarce resource inventories

Boston Cablevision Services, Inc.

*Data transmission and retrieval
*Distribution of educational programs to healthcare professionals
*Distribution of health maintenance programs to residents
*Distribution of informational and directional programs to patients

Cablevision Systems Boston Corporation

*Interconnection of medical institutions
*Distribution of in-patient educational programs
*Transmission of locally produced Health Maintenance programs to health facility waiting rooms and to the residential network supplemented by alphanumeric text information
*Data processing (e.g., billings, files)

*Distribution of Professional and Continuing Medical Education (CME) courses to institutions, homes and offices

*Interactive capability on CME service (key pad with buttons)

*Centralize demographic and health related data for research and analysis (e.g., lab reports, research databases, birth, death, mobility data in neighborhoods, etc.)

*Transmit vital medical statistics

*Inventories and management of scarce resources

Rollins Cablevision

*Health Maintenance channel: education programs on the subcriber network

*Educational programs for physicians and hospital staff

*Building and equipment security: panic buttons to police and fire departments

*Interconnect computer and terminal

*Reception of emergency announcements

Tribune Cable of Boston (Chicago Tribune and Douglas Communications, Inc.)

*Cable link of all health institutions

*Teleconferencing

*On the job training

*Administrative communication

Times Mirror Company

*Medical record storage

*Transmission of health educational programs to subscribers

*Health institutional network

*Marketing of locally produced healthcare programs

*Vocational and professional educational programs to health providers

*Creation of facsimile links

Warner-Amex Cable Communications, Inc.

*Distribution of health programs to subscribers

*Distribution of training and educational program to health professionals

*Connection of all health institutions

*Data transmission and retrieval

*Medi-Alert
*Videotext (alphanumeric capacity)
*Telediagnosis/teleconsultation
*Teleconferencing

It is important to note that none of the cable companies describe their proposed uses in any detail. Nor do they suggest ways to implement such uses. And it appears, from the Cablevision plan, that any social services development on the Boston cable is now the responsibility of the Public Access Foundation.

Thus, it seems that cable companies do not, at the present time, intend to develop public institutional services in the way that they have developed a great variety of residential services. One reason for this may be the preference of the cable industry to concentrate its activities on what it considers to be the more lucrative residential market, a market, it should be noted, which the companies themselves have created and made profitable in urban areas.

Of the many suggested uses of cable television by the cable companies, only ten uses stand out as relevant to the delivery of healthcare by neighborhood health centers. These ten can be categorized under one of the four following cable service headings:

I. Distribution of Programs

a) Distribution of health education programs to the public

b) Distribution of vocational, professional and Continuing Medical Education (CME) courses to healthcare personnel and to students

II. Transmission of Data

a) Transmission of medical records and statistics

b) Centralization of demographic and health-related data

c) Inventory and management of scarce resources

III. Two-Way Communications

a) Teleconsultation

b) Telediagnosis

c) Teleconferencing

d) Interdepartmental communication

IV. Simple Interactive Communication

a) Medi-Alert

The four cable service headings are within the technological capability of the coming Boston cable system. However, cable technology alone will not turn any of the suggested uses in to working services. Each suggested use requires some measure of explanation as to how it could be realized. More importantly, the appropriateness and impact of each suggested use should be noted, given the concerns of Boston NHCs. With these

guidelines in mind, presented below is an analysis of each suggested use of cable television in terms of neighborhood healthcare delivery.

Distribution of Health Education Programs

As mentioned earlier in Chapter I, neighborhood health centers are committed to and engage in the dissemination of health information to the public. The distribution of health education programs on cable television is not only another means by which NHCs could make health information more accessible but also a way for them to advertise their services and attract more patients. The assumption here is that the convenience of home television viewing expands the audience for health education.

One scenario to emerge from this suggested use of cable TV would be as follows: health education classes at NHCs would be filmed and the resulting programs distributed on a public access channel of the residential network.

A consideration of this use of cable TV raises two key issues. The first issue has to dowith program production. Television equipment and trained people to use the equipment are necessary for program production. At present, Boston NHCs lack both trained people and equipment. Neither Cablevision nor the few hospitals which have such resources for closed-circuit TV program development have expressed any interest in producing programs for NHCs.

However, it is anticipated that Cablevision, the Public Access Foundation and many local schools will be offering courses in TV production in the near future at low or no cost to encourage the involvement of local residents in local programming. Public access to Cablevision

production studios and equipment has the goal of public involvement in mind.

Thus, there is the possibility that community residents could use Cablevision's facilities and equipment to produce shows for NHCs. This activity would increase community involvement in the function of NHCs and therefore strengthen the ties between centers and their communities.

The second issue has to do with the effectiveness of the method of education. Will people watch the programs? Residents must first subscribe to the basic cable TV service in order to receive public access channels in their homes. The low subscriber price combined with an aggressive Cablevision marketing approach to residential services (the company seeks to sign up at least 74% of all Boston households for its basic service) encourages a large audience for cable television installation in homes. Whether people will watch the programs or not are related to such issues as the timing of the programs on the TV, the advanced publicizing of such programs, and the quality of the programming.

Distribution of vocational, professional and Continuing Medical Education (CME) courses to healthcare personnel and to students

Many schools and hospitals in the Boston area offer continuing education to healthcare professionals in a variety of health fields. However, the time and location at which courses are given may make it difficult for busy professionals, particularly doctors, to take advantage of these courses.

The distribution of courses on cable television could alleviate certaintime and location constratints. Courses could be filmed and shown

at a different time, or several different times, for the convenience of professionals with varying and inconsistent work schedules. They could be aired at a variety of locations; at neighborhood health centers through the use of thePIN, or in homes through the residential network, to name a few examples. The time and location options offered through cable communications increase the opportunities for profesionals to keep informed in their respective fields.

It is most likely that universities and hospitals will lead the way in the development of continuing education programs on cable television, if it occurs. Several medical schools and hospitals have been filming classes for the education of their own personnel and students.

Two factors will govern the decision as to whether professionals will take courses via cable television: the cost of taking courses, and the true convenience, as compared to other forms of course instruction. For example, an individual may find it more convenient and cheaper to rent an educational videotape and view it at his or her own leisure at home or in a library.

A different type of training is that which neighborhood health centers are actively involved in: the training of community residents to assume nonprofessional staff positions in the centers. The number of people trained by all centers might be a large enough audience to warrent the production of educational programs and their distribution on cable TV; however, the training of community residents, unlike the education of healthcare professionals, is not standardized among centers. Each center gears its training to its particular organizational structure and to the needs of

its particular community. This type of small-scale training seems inappropriate in the context of cable TV programming and distribution.

Transmission of Medical Records and Statistics

A patient's single medical record is kept on file in a particular medical institution. Currently, there is no way to move this record from one institution to another quickly and easily. This situation hampers the delivery of healthcare when a patient is referred from one healthcare facility to another.

Cable television has the capacity totransmit medical records and statistics quickly and efficiently.

Computers and other informational systems of different health facilities could be linked by cable for the exchange of medical information. In Boston, the linkage would be made using the PIN.

The major technical consideration in the implementation of this data exchange system is the use of a computer system and computer programming common to all healthcare institutions. At present, most hospitals use computers and telephones for internal data transmission, but each hospital has its own particular computer system. It would be extremely costly to convert these various systems into one uniform system. Neighborhood health centers, most of which do not have computer systems, would first have to overcome the cost of acquiring a computer before addressing the issue of connections with other hospitals.

The key impact issue in this suggested use has to do with the confidentiality of a patient's record. The transmission of data on a channel is available for viewing by those who have access to the channel. In this

case, all users of the PIN could view a patient's record by turning to the appropriate channel slated for medical data transmission.

One solution to this dilemma would be the use of an identifying code, such as a social security number, to replace a patient's name and thereby insure more confidential transmission of data.

Centralization of Demographic and Health-related Data

It would be useful for neighborhood health centers to have access to demographic and health-related data about their communities, given their orientation to the health of the community as a whole, not merely individuals. Access to this information using cable television would most likely be in the form of a large databank on the PIN.

Technical considerations would involve the development and management of the databank.

The cost here to NHCs would include not only an investment in computer equipment to call for and acquire information, but also the service charge for using the databank.

To justify the cost of databank creation, it seems the information on the databnk would have to be continuously updated. Otherwise, it would appear that information could be more easily and cheaply acquired by other means, such as municipal reports and student research.

Inventory and Management of Scarce Resources

Examples of scarce medical resources include: blood, donor organs, and rare medicines. Within a health facility and among health institutions, the telephone is most commonly used to find out what resources are available and where they are located.

A databank of scarce resource information, which all healthcare institutions could have access to through the use of the PIN, would encourage the more timely and efficient use of these resources, particularly in emergencies.

The management of this databank is key to its usefulness, and the major barrier to successful implementation of this use.

Teleconsultation

Teleconsultation refers to a medical consultation between a healthcare provider in one location and a patient in another location. This service was developed in rural areas which lacked resident physicians. The innovation of teleconsultation in healthcare delivery was the use of two-way television communication to supplement audio communication by telephone. Currently, transmission between the two locations involves the use of point-to-point microwave technology.

It is possible for a cable wire to replace microwave equipment in teleconsultation transmission.

A teleconsultation system between a neighborhood health center and a hospital would enable a patient at a center tocommunicate directly with, for example, a specialist in a hospital, and thus avoid the time and expense of traveling between two locations. Other advantages for the patient would be the provision of healthcare in the comfort of the center's familiar surroundings, and ready access to center staff when communication problems (foreign language, cultural differences, etc.) arise between a patient and a hospital doctor.

The establishment of a teleconsultation system requires not only

a communications link such as a cable connection between two locations, but also television cameras, TV screens, microphones and/or telephones at each location. Healthcare personnel need to be trained in using the equipment. There are thus capital and training costs to be considered in the implementation of this service. The volume of patient referrals by health centers to hospitals is a factor in considering an investment in teleconsultation.

It is obviously more difficult to maintain confidentiality on a cable channel in teleconsultation than in data transmission. One can assume that people involved in teleconsultation would prefer completely private communication between two parties, similar to private two-way communication by telephone. The cable system needed to bring about these one-to-one private correspondances on a mass scale would be far more technically sophisticated than the planned public institutional network.

Telediagnosis

Telediagnosis is teleconsultation with the addition of medical data transmission. A telediagnosis system using cable technology would have electronic instruments connected to the cable for the transmission and reception of such physiological data as EKG, pulse rate, respiration rate and blood pressure.

The key issue here, in addition to the considerations mentioned in the discussion of teleconsultation, is the high cost of the electronic instruments.

Teleconferencing

Teleconferencing is a method by which individuals in two or more

locations can conduct live discussions with each other. At present, its most popular use is in the form of telephone conference calls. Teleconferencing by cable would add video capacity to the audio capacity in communications exchange.

The use of teleconferencing could expand teleconsultation and telediagnosis to include, for example, several healthcare providers consulting with each other or a group diagnosis of a patient.

A simple form of teleconferencing using cable television would have several doctors in different locations viewing a patient on individual TV screens and communicating among themselves by microphone or telephone. A more complex form of teleconferencing would enable all conference participants to see and speak to each other. With growing communications complexity would come the need for more sophisticated equipment and trained staff.

While NHC personnel can and do seek advice from professionals in various hospitals, there is little need for both audio and visual teleconferencing, as NHC staff handle relatively simple medical cases. More complex cases would be automatically referred to a hospital. If necessary, health centers could use their available telephones for audio teleconferencing at low cost.

Interdepartmental Communication

A cable wire could be used as a means to provide two-way audio and visual communications among various departments of a neighborhood health center.

The cost of implementing such a communications system would be pro-

hibitive to NHCs. NHCs would have to pay for the internal cable wiring of the Center facility, as Cablevision is providing only one connection to the PIN per institution. Closed-circuit television would be the likely alternative if NHCs felt a need for internal visual communications. Audio communications through phone intercoms are possible and in use in Boston NHCs.

In general, this suggested use seems inappropriate to NHCs. Individually, their systems of operation are small and relegated to a single building setting; they have little need for a complex interdepartmental communications system.

Medi-Alert

Medi-Alert refers to an emergency medical service whereupon residents can inform health facilities of a need for assistance. Cablevision's interactive device, available on the residential network, could be used for this purpose. In the case of an emergency, a resident would push a button on the interactive device and alert the health facility. This service could be particularly helpful to elderly and homebound residents living alone.

Neighborhood health centers would have to decide if they wanted to add emergency outreach to their services, or allow traditional resources, such as hospitals with ambulances and paramedics, to continue handling medical emergencies.

In considering the implementation of cable Medi-Alert services, these services should be compared to the use of telephones and of Medi-Alert devices which can be worn on a person's body and travel beyond the residential home.

The analysis of various suggested uses of cable TV in healthcare delivery indicates that several factors will govern to what extent NHCs will use cable television, if at all. These factors are key to a consideration of cable television by neighborhood health centers. Broadly defined, these factors are: the matching of NHC concerns and objectives with cable television services, the absolute and relative costs of implementing these services, and the technical aspects of implementation.

Almost all the suggested uses have a measure of appropriateness to neighborhood healthcare delivery. Cable services development in the areas of health education to residents and information exchange with other medical institutions most directly address current concerns Boston NHCs have in educating their communities and providing the continuation of high quality care when NHC patients are referred to other medical institutions. Other suggestions, such as access to centralized medical and community information on a databank, and cable TV continuing education programs, can be of benefit to NHC staff and NHC operations. Still other uses, such as teleconsultation, telediagnosis and teleconferencing could be useful if the privacy issue could be addressed. Medi-Alert services are certainly services appropriate to the goals of NHCs in providing community-based healthcare.

The relevance of cable television to NHCs becomes more clear when the discussion moves from appropriateness to implementation. NHCs may use cable TV, but their participation in developing suggested uses into fully working services will relate directly to the matching of their healthcare delivery mission with service development. For example, it seems more

likely that NHCs would become involved in developing health education programming than in the development of a databank. The mission then leads to the establishment of priorities in their determining to what extent they will use cable television.

The absolute costs to NHCs of implementing cable services are dependent on the degree to which NHCs decide to participate in the development of these unprecedented services. For example, in the area of health education programming, NHCs could choose to buy all the television production equipment, hire trained personnel to handle the equipment,produce the programs themselves, and pay a service charge for distribution of the program from the PIN to the residential network. At the other extreme, the centers could encourage community residents to take advantage of Cablevision-supported public access resources (TV equipment, studios, technical expertise) for the volunteer development of center programs.

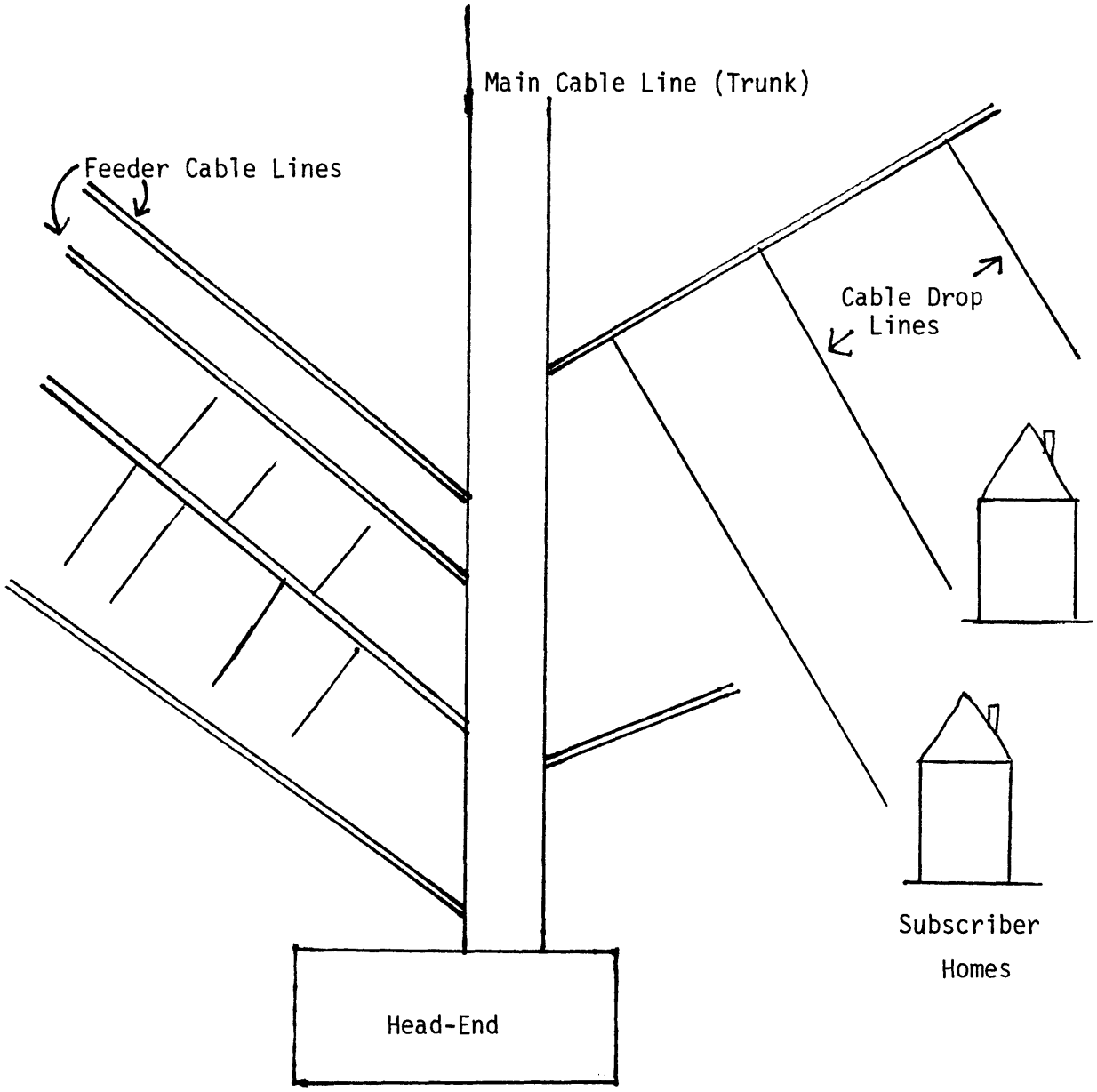
In one sense, no one cable service has a set cost to it; costs vary according to the availability of resources and manpower.

A discussion of relative costs of cable service implementation highlights the fact that the suggested uses are within the technical capability of other cost-effective and competitive technologies. Telephones, computers and microwave links are currently being used to transmit data and distribute health education programs. The advantages these type of technologies have over cable technology include the establishment of the infrastructure, people's familiarity with the technology, and the movement toward lowering costs with widespread use. The permanency of these advantages are not set, however; they exist for the present time because cable technology remains underutilized.

Relative costs can also be viewed from a totally different perspective. For example, is the savings for a patient of traveling time and expense in teleconsultation worth the cost of a lack of personal contact between healthcare professional and patient, or the possible lack of privacy when communication is on a TV channel? This question identifies the social and personal impact of communications methods. It then seems important that the social benefits and costs of cable television be examined, as well as the capital and manpower costs.

The fact that hospitals use different computer systems, and that a cable connection alone could not make possible information exchange between different computer systems, is a technical aspect of implementation which reflects the individual organizational structure and functioning of health institutions. The suggested uses of cable TV in healthcare delivery assume the need for a widespread, comprehensive audio and visual communications network among health institutions in Boston. NHCs will have to determine if the magnitude of their various communications needs requires the use of such a complex cable system, as envisioned by the cable companies.

Figure 1: CONFIGURATION OF A CABLE TELEVISION SYSTEM



FOOTNOTES

[1]D. Young, A Promise Kept: Boston's Neighborhood Health Centers, (Boston: Boston City Hospital, 1982), (unpublished), p.24.

[2]Ibid., p.28.

[3]Ibid., p.35.

[4]Ibid., p.41.

[5]Ibid., p.41.

[6]Boston Consumer's Council, On The Development Of A Cable Television System, (Boston:Mayor's Office, 1973), p.25.

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