IMPROVEMENT OF PATIENT ROOMS IN ACUTE CARE HOSPITALS: A SYSTEMS APPROACH

Thesis for the Degree of M. A.
MICHIGAN STATE UNIVERSITY
JAMES A. FERGUSON II
1972

ABSTRACT

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By

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This study is an attempt to investigate and propose a systems approach for the improvement of patient rooms in acute care hospitals and which should provide significant help toward the design of the entire health care system. All information contained in this study is based on a compilation of literature and personal interviews. In addition, this study aims to explore the health care system of the United States and show how it influences the design of the patient room. This study discusses "systems" and their effect on health care; the facilities of the present system; the population of the present system; and most important, the patient; who is he and what are his needs.

This study concludes that the design of the patient room cannot be initiated without a complete understanding of the health care system in which the room exists. This investigation of the health care system found a situation

which is fragmented by a multitude of local institutions. The health care system was found not to be oriented to the consumer/patient. This study found no means with which the present system could evaluate itself. It also found a minimal amount of research had been done on the health care system. The primary conclusion reached by this study is that a new health care system must be developed in order to promote improved health care.

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A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

Department of Human Environment and Design

1972

ACKNOWLEDGMENTS

The writer wishes to express sincere gratitude and appreciation to his committee co-chairmen, Dr. Mary Shipley and Mr. Jon Vredevoogd for their invaluable encouragement and guidance throughout the writing of this study; to members of his committee, Dr. Gertrude Nygren and Dr. Robert Rice for their helpful suggestions.

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CHAPTER I

INTRODUCTION

Health is the basis of one's existence. Health care has become a problem in that existence. One is constantly being plagued with infection and disease from sources beyond his control. Technology and "wonder drugs" have made but a small imprint on the surface of the problem. To better understand the problem one turns to the health care system. In order to use the system one must be sick, since it is not geared toward being well. Even health insurance is good only when one becomes sick. One seems to be penalized for good health.

Collectively the health care system represents one of the major industries in the nation. Individually the multitude of local institutions comprising the health care system lacks both the size and viewpoint to effectively develop system solutions.

Hospitals are small institutions with unusually complex functions. The hospital has stood for the "great plant of curing"; the emergency room, the "doctor's office" of the poor. Hospitals, like the health care system,

provide a multitude of services, each demanding improvement and each threatened by rising cost and obsolesence.

The patient rooms seem only to be designed for nursing and staff efficiency with little concern for the patient. The patient's environment should be conducive to his mental attitude and physical need while he is regaining health. The patient's total state of health should be the controlling factor of his environment and its measure of success or failure.

The writer believes that the existing health care system in the United States has been designed predominantly by the constraints and limitations of the existing system while in turn stifling good health and hampering recovery. Furthermore, the writer believes that improvement could be achieved by using the "system approach" to define the problem and design a new system. The solution to health care may lie in understanding the patient's relationship and relevancy to the system.

This study is an attempt to investigate and propose a systems approach for the improvement of patient rooms in acute care hsopitals and provide significant help towards the design of the entire health care system. In addition, this study aims to explore the health care system of the United States and show how it influences the design of the patient room. This study will discuss "systems" and their effect on health; the constraints

on the present system with some suggestions as to their change; and most important, the patient; who is he and what are his needs. It is vital that this research be undertaken.

In order to understand the complexities of the health care system in its present state and its ramifications at a future date, the writer believes a firm understanding of "systems approach" is needed. The following is an explanation of the "systems approach." The writer at no time considers this explanation to be an in-depth study, but simply finds it valuable for defining terms and approaches which will be discussed throughout the remaining portion of this thesis.

The Systems Approach

The field of systems and the use of the word system has become so overused as to become misused. System has two distinctively different meanings. "One way is a synonym of method or mode or procedure of doing something. System in a more technical, precise sense is an entity of resources marshalled to achieve particular goals or objectives."[1]

Five basic considerations that scientists believe must be kept in mind when thinking about the meaning of a

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[1]Harold Smalley, "A Systems Approach to Health Facility Planning," Herman Miller Health Care Conference Three, December 7, 8, 9, 1971.

system are: (1) the system's objectives and the performance measures of the whole system; (2) the system's environment: the fixed constraints; (3) the resources of the system; (4) the components of the system, their activities, goals, and measures of performance; (5) the management of the system.[2]

> System is a relative term in that every system has a subsystem within it. There are dangers involved in subsystems. If one is not careful you can get smaller and smaller subsystems that will begin to degenerate the problem and suboptimize the total system. On the other hand, if one keeps thinking of a system, no matter how large one thinks of it, as only part of something larger, then it will degenerate again on the other extreme. About the only solution to this is what has been referred to as "common sense" or judgment. The test being how large, how much of the total picture is of practical concern at the moment. Too much of what we do in the hospital field is to miss the real problem and deal with the symptoms or to deal with the wrong problems or to simply shift the problem from one area to another. A systems approach to a problem is one in which you minimize the chances of simply transferring a problem from one place to another.[3]

Definition of General Systems Terms

In order to gain an understanding of specific systems concepts, it is necessary at this point, to define certain systems terms.

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[2] Ibid.

[3] Charles W. Churchman, The Systems Approach (New York: Delacorte Press, 1968), pp. 29-30.

System.--"An entity composed of resources available to an organization."[4] One might think of a system as the furnace in his home.

Constraints.--Entities which confine or restrict. Fixed constraints are constant and inflexible. Alterable constraints are changeable and flexible.

Input.--Synonym of resources. This would be the fuel put into the furnace.

Output.--Product or services provided. This would be the heat produced by the furnace.

Costs.--Measures of the input, either tangible or intangible. Usually anything undesirable. In health care most weight is given to intangible costs.

Trade-off.--A situation of compromise with regard to quality and quantity.

Feedback.--A way of monitoring what is coming out of a system; a feeding back of information (or energy) in a flow from output to input. This would be the thermostat of the furnace.

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[4]Smalley, op. cit.

Evaluation.--Comparison of a system's performance with system's objectives. This would be whether or not the furnace produced the desired heat.

Depicted in Figure 1, with a black box concept, there is an input, an output, and a system. In Figure 2, the arrangement is complicated by a feedback subsystem. Figure 3 is another conceptualization of the same idea, but now it has what is called an "open-loop" evaluation feature which compares systems performance with systems objectives. This is an important point of evaluation which in many systems is ignored or done very poorly. The open-loop evaluation has no means of saying what should be done without there being any provision for changing the results.

Figure 4 depicts a "closed-loop" evaluation feature. Here, there is the capability to change the system as necessary to make performance conform more nearly to objectives.

When a system no longer achieves the intended goals and objectives a new solution must be sought as is the case in the health care system. There seem to be two alternate beginnings: one, improve the present system; two, design an entirely new system aiming for the ideal. But since we never start from ground zero, change must be initiated from where the situation is at the present time. Although this does not rule out aiming for the

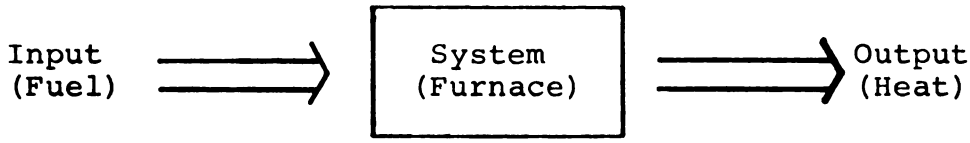

Figure 1. Fundamental "Building Block" Concept of Systems

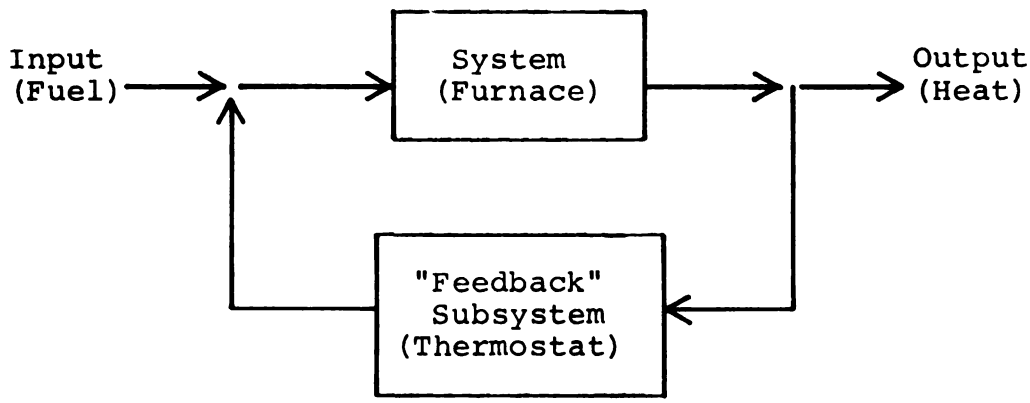

Figure 2. A "Feedback" Interconnection

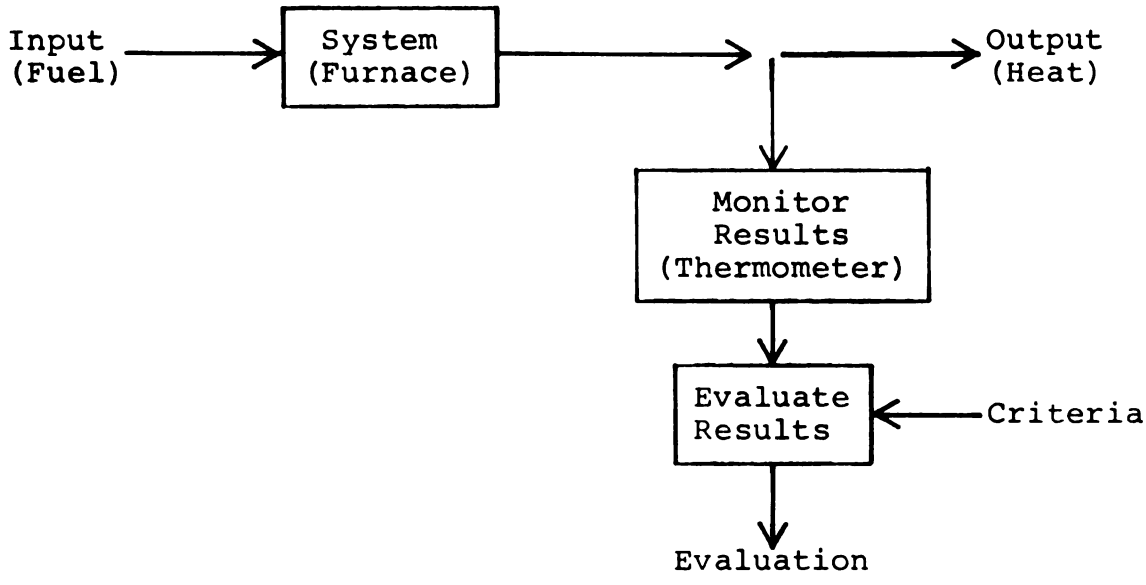

Figure 3. "Open Loop" Evaluation System

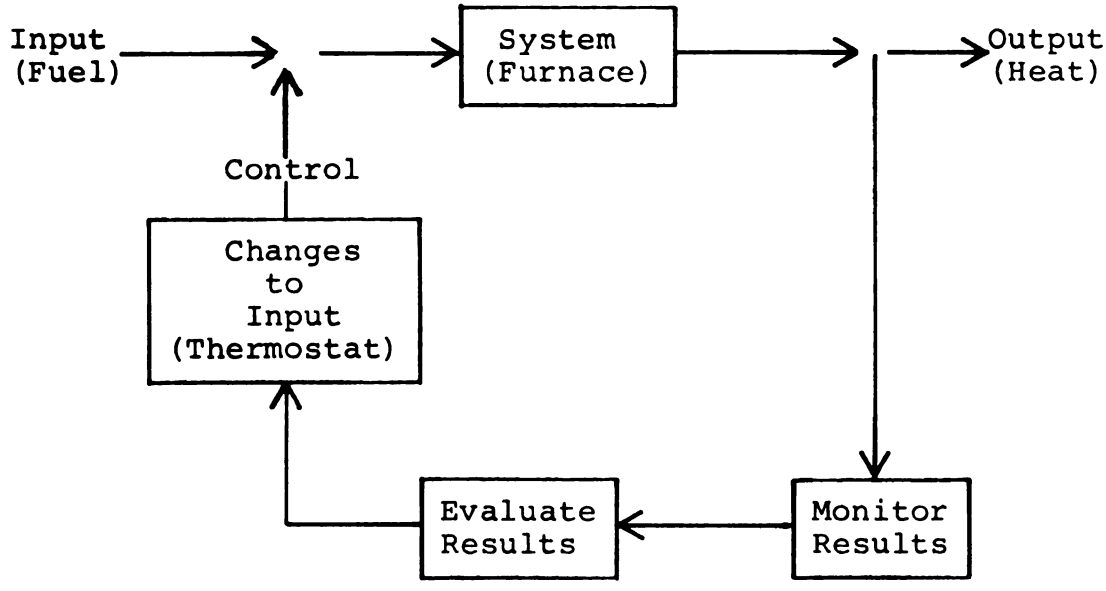

Figure 4. "Closed Loop" Evaluation System

ideal, in all probability change cannot achieve perfection because of the abundant number of constraints or limitations. The ideal approach starts with a functional objective rather than trying to patch up the existing system. One designs a system for achieving that objective without being inhibited by existing constraints.[5]

This simplified view of the systems approach quickly points out that this is a method and not a solution. If applied properly, it can simply be used to generate an optimal approach or strategy to a complex multidisciplinary problem.

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[5] *Ibid.*

CHAPTER II

THE HEALTH CARE SYSTEM

The health care system of the United States can be divided into four main parts: (1) Facilities, (2) Staff, (3) Consumer, and (4) Constraints.

Facilities

The facilities as defined by the Association of Directors of Health Facility Licensure and Certification Program, consist of five main groups: institutional room and board, intermediate supervised personal care, intermediate nursing care, skilled nursing care, and hospital care.[1] These groups are more fully defined in Appendix 1.

Staff

For the most part, the staff of the health care delivery system are considered to be the physicians, nurses, and administrators. Additional staff include:

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[1]Association of Directors of State and Territorial Health Facility Licensure and Certification Programs, Definition of Levels of Health Facility and Related Institutional Care (Lansing, Mich.: Association of Directors of State and Territorial Health Facility Licensure and Certification Programs, 1970).

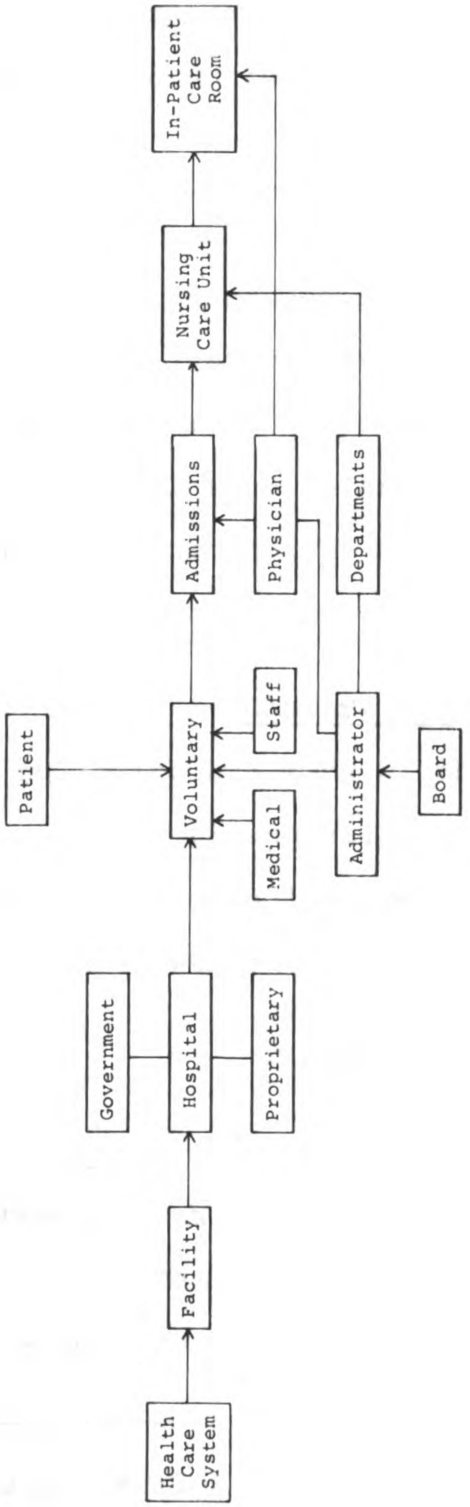

Figure 5. Present Health Care System

pharmacy, dentistry, and health-related professions. All members have one purpose: the well-being of patients. The staff deals with patients, rather than all persons.

Consumer

The consumer must be thought of as both the potential and actual consumer. The health care system is no longer concerned just with those people receiving care. In the federal government comprehensive health plan, insurance and medical service are provided for all Americans.[2] Health care is thought of by the consumer more as an inalienable right than as a purchased commodity.

Constraints

The following are some of the constraints of the health care system: financial, organizational/management, manpower, technology, obsolesence, building codes and regulations, and growth rate.

Financial

Financial/Facilities

In the past the financial burden was carried by the community. Since 1946 it has been assisted and guided by Public Law No. 725, 79th Congress, Amended, generally

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[2]Sheldon Miller, "United States Government State of Financial Support of Innovative Hospitals," Herman Miller Health Care Conference Three, December 7, 8, 9, 1971.

known as the Hill-Burton Program[3] (see Appendix 2). The original purpose of the program was to encourage the quantity of the health care system. The emphasis is now on the quantity and the quality of the health care provided.

Quality is controlled by minimal standards which have had little change since their creation and hinge the responsibility of quality on local building codes. The writer believes that the Hill-Burton program perpetuates an inadequate system by not assuming the responsibility of quality through its financial funding. It appears that the program has failed to evaluate the system. If evaluation has occurred the program has failed to recognize that a problem exists or has failed to feedback corrective inputs.

An intensive national inventory of health facility requirements must be taken. It must be known what facilities are needed and where these facilities should be located. The facilities must be geared to "preventive" health care as well as providing a "cure." Facilities such as day care centers, halfway institutions between the doctor's office and hospital, neighborhood clinics, well baby and children clinics, and a greater variety of

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[3]State Of Michigan, Michigan Department of Public Health, Michigan State Plan for Hospital and Medical Facilities Construction 1970-1971, pp. i-ii.

facilities for the aged. The writer believes that health care would be more effective if it were more dispersed with a greater emphasis on the community.

Financial/Insurance

Health care insurance was established to provide consumers with adequate health care protection. It falls into two categories.

Public (Federal Government). This includes social security, medicare, and medicade.

Private. This is Blue Cross/Blue Shield as the major provider and a variety of other notable insurance companies.

Reimbursement is substantially limited. Generally limited to hospitals and nursing homes, thus allowing the health insurance providers economic power in the distribution of facilities. The more substantial the expenditure by the federal government and private insurance companies for health care, the more likely they will exert their power and authority.

It is the opinion of the writer that the system must create incentives for good health, rather than being penalized. Health Maintenance Organizations (HMOs) are prepaid group practices and appear to offer quality care at generally lower cost to the consumer than the

traditional insurance methods. HMOs reward efficiency, whereas the current system all too frequently rewards excessiveness.[4] Such organizations guarantee their members the actual provision, not merely the financing, of a wide range of hospital and physician services. In exchange for guaranteed care, members make fixed monthly payments to HMOs. This system offers no incentive for unnecessary prolonged hospitalization.

Gross National Product (GNP)

An introduction of the GNP should be made because of its increased potential as a resource which can be used to improve the present system.

From 1940 to 1965 the percentage of the GNP increased from 4 to 6 per cent, from 1965 to 1970 increased from 6 to 7 per cent, and from 1970 to 1975 projected to be from 7 to 8 per cent. In 1965 the federal government began to control the greater portion of the funds provided for health care.[5] It appears that the decision-making power has been transferred from the community to the state and now to the federal government due to economic expenditures.

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[4]James H. Cavanaugh, "Proposed HMO and FHIP Programs Can Improve System," Hospital Progress (January, 1971), 27.

[5]Miller, op. cit.

Organizational/Management

The organization of the health care system is based on a hierarchy of authority. The point of origin is usually from the federal government and filters down through institutional entities. The organization is managed by various departmental heads which are placed at different points throughout the hierarchy.

The major problem in the organization of the health care system is the lack of communication and cooperation within the system. Departmental heads concern themselves only with their area of responsibility, their department.[6] In addition, it is often difficult to determine where the department heads' responsibility lies, what that responsibility is, and to whom they are responsible. This conflict is most prevalent between the following groups:

Government vs. Public

Providers vs. Consumers

Business vs. Medicine

Traditionalist vs. Management

The situation seems to necessitate a remodeling of the organizational structure. The writer believes that the health care system could be organized much like

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[6]Robert R. Cadmus, M.D., "The In-Between Years," Hospitals (February, 1971), 55.

that of a large corporation with district and regional managers. Whether or not this is the federal government's responsibility is not yet realized. This type of organization would make each part responsible to the whole and any deficiency in any part could then be corrected by the whole.

Manpower

There is a tremendous manpower shortage in all aspects of the health care field. This includes shortages in persons and in educational and training centers.

The consumer is one of the main persons penalized by the manpower shortage. To remedy this, less emphasis is placed on the patient in order to keep the system running. Personnel of the present manpower force are performing tasks they were not trained to perform. This is a waste in the potential of their skills.

The writer believes that a more efficient use of the manpower force must be attained. An increase in finances to educational centers, such as medical, nursing, and health-oriented technical schools, is a partial solution to increasing the manpower output. There is great potential in these intermediary health personnel because of the brevity of their education.

Technology

Technology, both medical and non-medical has caused the health system to be in a constant state of rapid change. New techniques of surgery, drugs, air conditioning, electronic equipment, and nuclear fission are but a few areas of technology which have affected this change.

The health care system has not kept up with the expanding technology and is now in a great time lag.[7] Equipment is generally non-modular or standardized and is disproportionate in its use.

The health care system must be made more adaptable to rapid change and more capable in using the advancing technology. Equipment should be standardized by its producers which would probably increase its quality merely by making the equipment the item for sale rather than its package.

Obsolesence

Obsolesence must be thought of in broader terms than just obsolesence of facilities, design, and equipment. There is also function, locational, social, and medical

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[7] Herman Field, "New Optimistic and Activists Concepts for Health Care Facility," Herman Miller Health Care Conference Three, December 7, 8, 9, 1971.

obsolesence.[8] Obsolesence in health care has thus far been addressed by rebuilding buildings for an outgoing health system.

Crash programs will not overcome the basic problem of obsolesence. It can only be accomplished by a new or improved system.

Building Codes and Regulations

Each structure must comply with building codes of the local community[9] (see Appendix 3). The codes are generally specified codes and are usually the same codes which are applicable to housing.

The writer believes the health care system is large enough to have codes and regulations written specifically for its use and based on performance standards rather than specified materials. Further, it is vital that building codes and regulations be updated rather than just revised.

Growth Rate

The population of the United States continues to bear a great pressure on the present health care system

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[8] Ibid.

[9] U.S., Department of Health, Education, and Welfare, General Standards of Construction and Equipment for Hospital and Medical Facilities, Public Health Service Publication No. 930-A-7, February 1969, pp. 7-8.

and has recently caused a greater emphasis on the delivery of health care. The growth rate will only cause the health care problem to worsen and appears to be a fixed constraint.

Though not listed, time is another constraint which is embedded in all those constraints previously listed. It causes change, creates obsolesence and a variety of other constraints. Time must clearly be recognized and dealt with if the health care system is to improve.

The health care system as explained here may appear to be over-simplified. As the system is divided into its components the complexities become evident.

CHAPTER III

THE HOSPITAL SYSTEM

Public attention is being turned upon hospitals as focal points of the nation's health facilities. For the average American, modern hospital service is a commodity he purchases under compulsion and at prices far beyond his comprehension. It is said that this is all done for the patient/consumer with the assurance that he is benefitting from the highest standards of hospital care in the world.

Hospitals are usually engaged in one or all of the following functions: the care of the sick, public and professional medical education, the conduct of research, and the practice of "preventive" medicine.[1]

Hospitals can be divided into three general types based on method of finance and services: the voluntary, the governmental, and the proprietary or profit-making.

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[1]Raymond P. Sloan, Today's Hospital (New York: Harper and Row, 1966), p. 11.

The Facility

Types

Voluntary

Voluntary hospitals provide by far the most beds in the United States. Sponsorship usually comes from the community, a church, or a fraternal, civic or labor organization.

The following characteristics are usually found in the voluntary hospital. Voluntary hospitals are public enterprises conducted under private management. They are managed by hospital boards, representative of the community and are legally and morally responsible for its professional services, properties and policies. They aim to provide the essential physical facilities to maintain a comprehensive program of health care predicated on community needs. Voluntary hospitals accrue no financial gain nor are they liable for debts incurred. They are usually exempt from federal, state, and local taxation. One-half of the hospital's income comes from health insurance, with the government paying for those medically indigent. The balance comes from endowments, community chest drives, or from individual hospital fund-raising campaigns.

Government

Many government hospitals concentrate upon care of war veterans and the chronically ill, particularly those suffering from mental disorders or tuberculosis.

The following characteristics are usually found in the government hospital. Government hospital's management rests with an appointed or elected governmental official. Occasionally an advisory board, comprised of business or professional leaders, serves as management counselors. These hospitals are supported by tax funds and are sponsored by federal, state, city, or county bodies. Patients pay little if anything.

Proprietary

Proprietary hospitals are found most frequently in communities showing a rapid population growth and which still lack benefits of voluntary hospital services.

The following characteristics are usually found in the proprietary hospital. Founders serve as board members, controlling all policies and sharing any profit that may accrue. They are financed by doctors or other individuals who see advantages in the greater independence and flexibility of rules existing under individual control. Proprietary hospitals are usually small and treat limited acute in-patient illness. They seldom have community-related services such as emergency rooms.

Other Types

Though the following are not distinct hospital types, the writer believes that they should be introduced at this point. They are: teaching hospital and group practice.

A teaching hospital is generally of the voluntary or governmental type. It is for the purpose of training interns and for residencies and fellowships in the medical specialities. Many are affiliated with medical schools or universities.

Group practice will not always have the end result of a hospital but does have that capability. It is simply physicians who band together for mutual interests. An example of group practice is the Kaiser Foundation.

Services

General

General hospitals provide care for patients suffering from a variety of diseases. The trend is away from the "special disease" hospital and toward the general hospital assuming responsibility directly or indirectly for all physical or mental disabilities. They generally provide a more comprehensive service.

Special

Special hospitals treat specific maladies such as throat diseases, cancer, tuberculosis, mental and nervous disorders, and long-term illness. Children's hospitals, communicable disease hospitals and convalescent homes are similarly classified.

Size

Hospital size is rated by bed capacity for which the building was originally designed.

Small

One hundred beds or less (majority of United States hospitals).

Medium

One hundred to 300 beds.

Large

Three hundred to 1,000 beds or more.

Length of Stay and Occupancy

Short-term

Short-term hospitals are those offering acute care. The average length of stay is seven to eight days.

Long-term

Long-term hospitals provide care for patients with chronic conditions or illness, those for which extended periods of treatment are required.

Percentage of Occupancy

Percentage of occupancy is the degree to which a hospital is occupied. An average annual occupancy of 80 per cent is considered optimum use.

This thesis is primarily concerned with the voluntary general short-term hospital although the following material could also relate to the other hospital types and services described. Any change of a component makeup of a hospital, however, will cause a change in the design. As an example, size is an important aspect of the design in that increased size usually increases the complexity of the hospital. This thesis will deal with the medium and large hospitals.

The planning and design of a hospital is usually based upon the organization and operating policies of the hospital. Authority is grouped along the same lines.

The Population

Organization

Four various modes of organization can be found within the hospital and are defined as: Functional, Process, Territorial, and Product.

Functional

Grouping activities according to an enterprise's major tasks.

Process

Grouping activities around equipment and machinery in order to carry out a particular operation.

Territorial

Grouping activities on the basis of geography.

Product

Grouping activities on the basis of output.

The predominant modes of hospital organization are the process and functional departmentation. The administration of most medium and large hospitals is functionally organized.[2] Primary departmentation is created by the delegation of responsibilities to assistants or associates. Although there is a variation among hospitals the following positions are usually present: (1) financial matters, (2) plant services, (3) ancillary professional services, and (4) staff-organized activities such as: personnel, public relations, and hospital volunteers.

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[2]David B. Starkweather, "Rationale for Decentralization in Large Hospitals," Hospital Administration (Spring, 1970), 32.

The medical staff is a functionally organized unit with departmentation by clinical specialization (internal medicine, pediatrics, surgery, etc.).[3]

Nursing services are typically a mixture of process, territorial, and product organization. The "nurses station" is primarily territorial, but due to variation has implications of all three departmentations.[4] Surgery, delivery and emergency nursing care have strong elements of process departmentation.

Within many operating departments of the hospital the internal divisionalization is functional or process in type, such as: (1) X-ray--process, (2) lab--process and function, (3) business office--function, (4) central supply--process and product. A few activities are territorial such as housekeeping and in some cases dietary.

The following departments are usually represented in some form within the hospital: (1) administrative, (2) admitting, (3) business office, (4) central supply, (5) dietary, (6) engineering and maintenance, (7) housekeeping, (8) laboratory, (9) laundry, (10) medical records, (11) nursing, (12) operating rooms, (13) outpatient, (14) pharmacy, (15) radiology, (16) social work. Additional departments are sometimes further derived from these major headings.[5]

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[3] Ibid.

[4] Ibid.

[5] Addison C. Bennett, "Guidelines to Use in Identifying Possibilities for Improvement," Hospital Topics (August, 1970), 27-28.

Staff

Essentially, the staff of the hospital are representative of the health care system. The principal staff members of the hospital are the administrator, the physician, and the nurse.

Hospital Board

The hospital board is the body responsible for the professional services, properties, and policies of the hospital. Their role depends on the type of hospital and the services provided by that hospital. Further discussion of hospital boards is contained under the heading of "Constraints."

The Administrator

The administrator's authority stems from the board of directors of his hospital. His duties and responsibilities include the following.

The administrator manages the hospital through the application and implementation of policies. He provides a liaison among the governing body, the medical staff, and the departments of the hospital. He is in charge of the organization of the administrative functions of the hospital and delegation of duties. The administrator establishes a means of accountability on the part of subordinates. He also provides for control and use of the physical and financial resources of the

hospital. Thus, he provides appropriate physical resources and personnel required to meet the need of the patients; as well as participation in planning to meet the health needs of the community.

The Physician

The medical staff, of which the physician is a part, is responsible to the hospital's governing body and the administrator. The medical staff is usually represented by a physician known as the "chief of staff." The medical staff has the following responsibilities.

The medical staff establishes by-laws, rules, and regulations subject to the approval of the governing body. They are responsible for the establishment of effective means for the medical staff to participate in the development of hospital policy relative to both hospital management and patient care. The physicians admit patients to the hospital and are responsible for the medical aspects of each hospitalized patient's care.

The Nurse

The term "nurse" usually applies to the registered licensed nurse. The nurse usually supplies those services needed for the professional care of patients. The registered nurse has the professional authority and responsibility second only to the physician. The other staff included in the nursing service are: the practical

nurse, the nurse's aid, and attendants. The duties and responsibilities of the nurse are the following.

The nurse cares for the needs of the patient. She administers medication and charts the patient's status. The nurse also strives to control infection and provide patient safety.

Other Staff

The remaining staff of the hospital are vital in the organization but have a small part, if any, in the decision making and planning of the hospital complex. The staff is made up from the departments found in the hospital (refer to Organization, p. 27).

The Consumer/Patient

Approximately one in eight persons in the United States becomes a hospital patient annually. Non-patients also find use in the hospital such as: the emergency room, the out-patient clinic, hospital classes for pre- and post-natal care and chronic ailments such as diabetes, or simply for visiting sick relatives and friends.

The hospital sells goods and services to the consumer/patient for his consumption. The consumer/patient pays for these services either outright or through some form of insurance. The following are some of the products consumed by the patient: (1) laboratory

determinations, (2) clean laundry, (3) meals, (4) X-ray tests, (5) medications, (6) nursing care, and (7) surgical services.

It is for the consumer/patient that the hospital exists. He should be the key factor on which the hospital is based.

The Constraints

The following are some of the constraints of the hospital system: financial, organizational/management, manpower/staff, construction and renovation, and technology.

Financial

Financial/Hill-Burton

This program can usually supply 34 to 55 per cent of the cost of renovation or new construction. This can increase to 90 per cent if the services are for rural or urban poverty areas or if hospitals can reduce costs through shared services. This program can also assist in the purchasing of equipment without renovation or new construction. Loans are also possible under this program. With each loan, grant, or subsidy are minimal standards to be used as "guides" for the purpose of the grant, be it construction or equipment.[6] These standards

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[6]Sheldon Miller, "Fact Sheet on Hill-Burton Program," November, 1970.

are not enforceable by law but without them there is no financial aid.

It seems evident by the status of the present system that minimal standards do not bring about quality of facilities. The number and size of the physical plants seem to be of a greater importance than the patient. Hill-Burton does very little, if any, evaluation once an institution has met the program's minimal standards.

The writer also feels that the Hill-Burton program should exact more for the use of its funds and take a greater responsibility for improved quality of facilities. Since the Hill-Burton program has the economic power of funding it has the ability to question need in reference to a national plan. It also has the ability to place the patient first and the physical plant second.

The hospital system must increase its research and experimentation, just as other large industries have done, so the system will not become stagnant and eventually die.

Financial/Bond Issues

Several types of bond issues are available for hospital capitalization purposes. The use of bonds to finance hospitals means that in many cases hospitals are forced to compete with school districts for the same dollar in the bond market. Such tradeoffs weaken the competitive process for the bond since schools usually

affect persons on a day to day basis, whereas hospitals affect persons only when they become sick.

The community should automatically allocate some form of financial aid to maintain and improve the hospital. In doing this the community will probably become more concerned with the hospital, the health care, and its support.

Financial/Health Insurance

Various companies provide health insurance with Blue Cross as the largest private financier of hospital care. It also provides most of the machinery for operating the governmental Medicare and Medicade programs. Although government ultimately pays for these programs, it rarely pays a hospital directly but rather funds through intermediaries such as Blue Cross who in turn pays the hospitals.[7]

The intermediaries are placed in the key position to determine how the federal programs are run. Thus, Blue Cross is a major factor in controlling medical costs. They are also in the position to create some continuity in the health care system.

Blue Cross finances essentially only in-patient benefits. Control of Blue Cross is by self-recruited trustees and in no case is controlled by subscribers.

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[7]Robert M. Cunningham, The Third World of Medicine (New York: McGraw-Hill, Inc., 1968), p. 72.

Blue Cross pays hospitals directly on a cost-plus basis placing no controls on efficiency of the hospital.

The insurance companies, in particular Blue Cross, conduct little evaluation. Thus, the patient/consumer suffers the increasing rates with decreasing services. As providers for the patient/consumer the health insurance companies must become more representative of patient's needs rather than those of the hospital.

Organizational/Management

Due to the organizational structure of the hospital (see Organization, p. 27) the professional and administrative activities of large hospitals are organized predominantly into two semi-autonomous groups where only the top officials of these hierarchies have the ability to integrate these separate groups. Communications break down because each group has its own set of problems and procedures often incomprehensible to the second party.[8] The major components between which communications break down are: hospital boards vs. administrator, administrator vs. physicians, hospitals vs. community, and hospitals vs. hospitals.

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[8]Starkweather, op. cit., p. 34.

Hospital Boards vs. Administrators

Often the role of the administrator is curtailed by the failure of the hospital board to allocate the proper authority.[9]

Is the hospital board a necessary entity? Would not it be just as valid to have the administrator responsible to a regional board and have a group of hospital consultants work for the administrator as his cabinet? This might even create a greater degree of objectivity necessary for the analysis of patient needs.

Administrator vs. Physicians

There is a lack of communication between these two factions since neither understands the problems involved in the other's realm of responsibility and generally they have limited concern.

The realm of responsibility between the administrator and physician must change or no compromise can be made and the system will go unchanged. This does not mean that each faction has to submit to the other. It only means that a compromise must be reached for the benefit of the patient rather than for the benefit of either faction.

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[9]Owen B. Hardy, "Delegation: The Administrator's Challenge," Hospital Administration, XV, No. 1 (Winter, 1970), 9.

Hospitals vs. Community

There seems to be little understanding between the hospital and the community. Both must be educated to the needs of the other. The system cannot be improved without community input and community support. Nor can the hospital expect such input if the community is unaware of the complexities and problems involved.

Hospitals vs. Hospitals

Hospitals are presently in competition for the patient rather than providing high quality services. The patient is thought of as a source of revenue rather than as a person who needs care. The patient simply pays the price. Hospitals must learn to cooperate for the betterment of the patient and the community.[10] Cooperation among hospitals is another means of injecting continuity into the system. The result is an increase in quality of care for the patient.

The planning and design of the hospital is in many ways predetermined by the coherent departmentation and organization of the hospital.

Manpower/Staff

There is a tremendous manpower shortage for health services especially in the hospital. The whole

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[10]John Bigelow, "Why Hospitals Fail to Cooperate," Hospital Progress (February, 1971), 43.

question of quality care and patient-oriented care, particularly in hospitals, is closely tied not only to the availability of manpower but also to the education and training of that needed manpower.[11]

The physician is far outnumbered by patients he is to serve. With specialization of the physicians has come an increase in the scarcity of the physicians and less time for patients.

The nursing shortage in hospitals is due to the educational output of nurses and the high cost of maintaining registered nurses on hospital staffs. Changing techniques of hospitalization have brought about change in the nursing function. The increase in medical and hospital technical skills can be seen as a basic factor in depersonalization of nursing.

Is the solution simply more physicians and nurses? Obviously this is a partial solution but this shortage has been a guiding factor for the past thirty years. Perhaps more intermediate hospital staff are needed. This would allow the physician and nurse to use their skills more efficiently and also create more personal care for the patient. The intermediate hospital staff would perform the technical skills needed in the hospital and allow both the physician and the nurse an

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[11]Richard L. Johnson, "The Hospital Organization and Its Problems," Hospital Progress (June, 1970), 70.

expanded viewpoint of patient needs and care. Such a viewpoint might include input from: housekeeping, dietary, pharmacy, admissions, and visitors; to mention just a few.

Construction and Renovation

It is important to realize that hospital construction and renovation must also deal with constraints other than just the procurement of funds. They are: inflation, involving high interest rates, increased costs of labor, material and transportation, obsolesence, and building codes and regulations.

The above constraints indirectly influence the patient because when the tradeoff is between cost and the patient the cost portion usually wins. Their influence on the patient will further be discussed in the following chapter dealing with the nursing/in-patient care unit.

Technology

Advancing technology has caused a great increase in medical costs. Tradeoffs must be made between highly expensive equipment and services rendered. Colbalt therapy, fluoroscopy, 18-test blood panels, specialized surgical teams, and so on can save lives, limit procedures, but there is a question as to whether their services can offset their extreme cost.

The writer must ask the question: Is all this technology necessary? Why should two hospitals in the same community have cobalt therapy when its need might only require one such piece of equipment. Much of the equipment and specialization is geared toward the prestige of the hospital. A hospital with the "latest" technological advances has the selling point to the consumer of providing the most advanced care. It is the patient/consumer who will pay for such equipment even though he might never use it. A new organizational approach might rectify this situation.

Time

Time is also embedded in the constraints of the hospital system. Most facilities have such a time lag in design and planning that they have to deal with retrospective goals and objectives.

Through the planning and design of the hospital is in many ways predetermined by the coherent departmentation and organization of the hospital and the constraints imposed on that system many variations in design occur. The nursing service/in-patient care units compose 50 to 60 per cent of the hospital space.[12] Therefore, in describing architectural types and rationale of their design the writer will limit his discussion and emphasis to the nursing service/in-patient care unit.

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[12]Janice F. Dolson, "The Nurse in Management," Hospital Forum (February, 1971).

CHAPTER IV

NURSING SERVICE/IN-PATIENT CARE UNIT

The Facility

The nursing service/in-patient care unit has become the main unit of which the remainder of the hospital encompasses. The nursing service/in-patient care unit usually comprises 50 to 60 per cent of the total hospital space. It is customarily made up of patient rooms, a nursing station, and some limited supply points to serve the unit.

Rationale of Design

The present configuration of the nursing service/in-patient care unit has been developed based on traditional methods of care, hospital legislation, and limited principles developed through research. This trilogy has accounted for the facility's rationale of design.

13th-19th Century

In the thirteenth through the nineteenth century, units had long, open spaces with beds located on exterior walls.

Late 19th Century

During the late nineteenth century, units developed compact square and octagonal spaces with beds located on exterior walls focused toward nursing stations. Large wards were gradually replaced by smaller rooms off central corridor due to high noise level, little or no privacy, and impossibility to isolate.

1946 Hospital Construction and Survey Act (Hill-Burton)

The 1946 Hospital Construction and Survey Act (Hill-Burton) offered federal support while requiring adherence to minimal design standards. This has had considerable affect on hospital design for the last twenty years.

1947 American Hospital Association Institute on Hospital Planning

The goal of the 1947 American Hospital Association Institute on Hospital Planning was to reduce nurse's travel and increase direct nurse-patient contact.

Late 1950's

The Yale Traffic Index (Thompson and Pelletier) identified sixteen areas in typical nursing unit. It found seven of the sixteen areas to account for 91 per cent of the unit's traffic.

1962 and 1963 Public Health Service

The 1962 and 1963 Public Health Service funded: a construction project in which comparative studies were made in new hospital building planned to provide facilities for controlled investigators; a new organization of the elements of the hospital building to provide more efficient personnel utilization, greater flexibility, improved patient safety and comfort; the detailed analysis of the internal activities of one hospital department developed methods for sounder design decisions applicable throughout the hospital.

1963 and 1964 AHA and AIA Project

The 1963 and 1964 AHA and AIA Project, funded by Public Health Services, developed methods for general hospitals for estimating space needs, cost of construction, factors that most influence or control design and development of criteria.

1970

Delon and Smalley identified frequency of travel in typical hospital, cost of employee time, and pro-rated cost of construction.[1]

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[1]Gerald L. Delon and Harold Smalley, "Concepts and Plan of Research," Health Service Research (Fall, 1970), 189-92.

1970 Medical Planning Associates (MPA)

The 1970 Medical Planning Associates (MPA) determined indicators of travel characteristics of nursing unit design.[2]

Each of the cited unit analyses related originally to different hospitals with varying parameters. The general plan types are surprisingly consistent.

Types of Plans

The following plans have been developed due to the rationale of design previously cited. These represent some of the variations of plans now in use.

Double-loaded Corridor (not shown)

The double-loaded corridor has been the standard plan for many years. It supplied natural lighting and cross ventilation. This plan has excessively long distances between nurse station and end rooms of units.

Compact Plan

The recent trend has been toward the compact plan. It is recognized as generally superior, with internal core organization and layout the primary indicator and the exterior shape far less important.

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[2]William B. Foxhall, "Hospitals: Building Types Study," Architectural Record (September, 1971), 152.

The following compact plans are based on multiple and single patient rooms.[3]

Circular.--The circular plan (Figure 6) is very compact with elevators located outside the care unit to serve additional units. The patient rooms are located around the nursing support space with patient beds located on the exterior walls. There is redundant circulation with more than one possible route from point to point.

The number of patient rooms dictated by program requirements controls the diameter of the circle. It is purely coincidental when the space in the center provides necessary square footage for nursing support. Most efficient when bed count and the support are in balance.

Rectilinear 1962.--This plan (Figure 7) has elevators located outside the care unit to serve additional units. Patient rooms are arrayed around the nursing support space with patient beds located on exterior walls.

Rectilinear is more flexible than circular in terms of the ratio of patient rooms to amount of support space because of ease in changing the exterior dimensions on each side while maintaining the same bed count. Most compact rectilinear plans of the same period compare quite favorably in measurement analysis with the circular plans.

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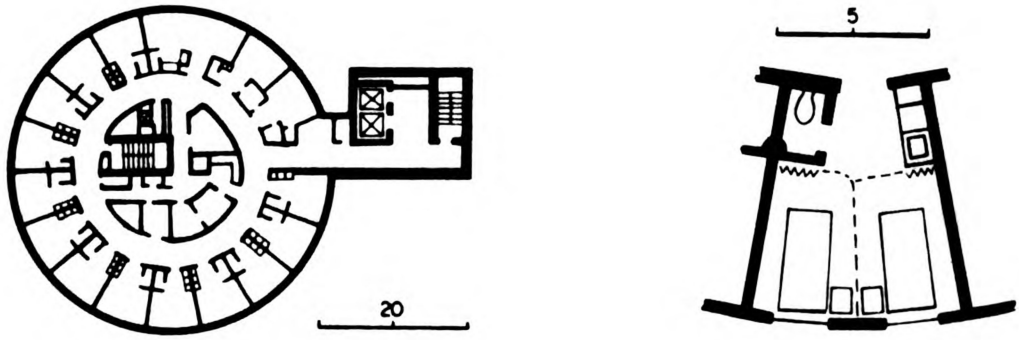
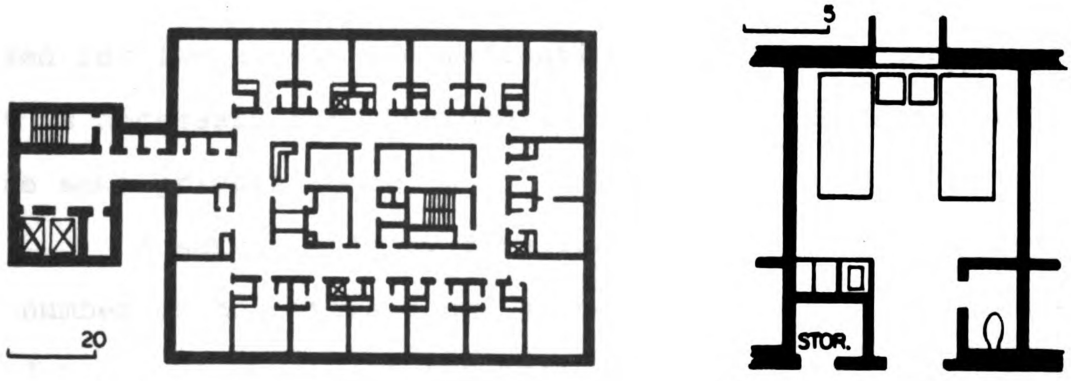
[3] Ibid., pp. 153-54.



Compact, Multiple And Single
Circular, Valley Presbyterian Phase 1, Van Nuys, Cal. (1955).
Pereira and Luckman

Fig. 6



Compact, Multiple and Single
Rectilinear, Providence, (1962).
Charles Luckman Associates

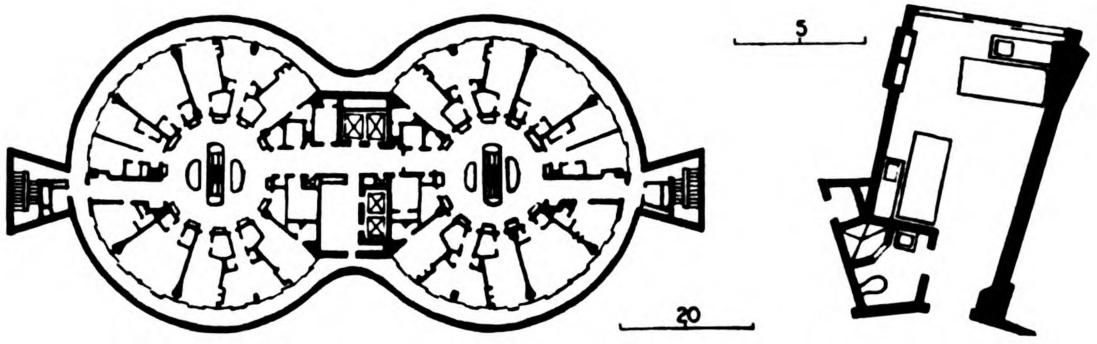
Fig. 7

Fused Circular 1962.--The center of the fused circular units (Figure 8) are void of all spaces and equipment not required for direct patient care. Support spaces are located in the link connecting the two units. The nurses' station can be completely opened for optimum visibility between nurses' station and patient room. This plan also has separation of visitor and staff traffic.

Conflicts in the enclosure in exterior corridor, because of the requirements for patient room windows to exterior, or in the problem of weather in most parts of the country which prevents open corridor approach.

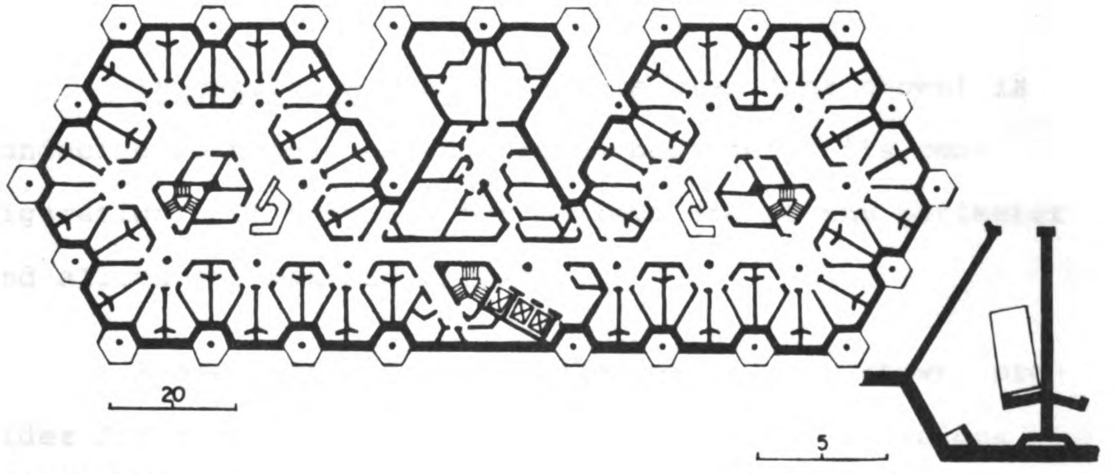
A private room provides the following: patient can have privacy, hospital may reach its objective of maximum occupancy, patients can be ambulatory earlier when shower and toilet are near at hand, any room can be used for isolation, and medication errors are reduced. It is necessary for the room to be highly compact versus the semi-private room.

A survey made by a religious order that operates a number of hospitals found 92 per cent of the physicians and hospital employees surveyed felt that their work was easier when their patients were housed in single rooms. Of the patients sampled 95 per cent said they would select private rooms if the cost were equal. A 1968 study by Herbert McLaughlin compared single versus two-bed rooms on the basis of the following costs: construction,



Compact, Multiple and Single
Fused Circular, Kaiser Foundation, Panorama City, Cal. (1962).
Clarence W. Mayhew

Fig. 8



Compact, Single
Hexagonal Twin Tower, Keweah Delta, Visalia, Cal. (1969).
James P. Locket

Fig. 9

furniture, maintenance, housekeeping, heating and ventilation, linen changes and nursing. Despite higher construction cost, single rooms showed an overall savings assuming high occupancy factors. The following compact plans are based on single patient rooms.[4]

Hexagonal Twin Tower.--This plan (Figure 9) is highly clustered around the nursing service. The support services are in the link of the towers. The patient beds are on interior walls with side outside view and placed diagonally to the corridor.

Rectilinear Sawtooth.--(Figures 10 and 11) Patient beds are located on exterior walls with side outside view and diagonal to the corridor. The nursing service shares two main modules.

Triangular Sawtooth[5].--This plan (not shown) is conducive to single patient rooms because of its configuration. It provides for maximum use of the perimeter and allows for maximum privacy.

Spoke Design[6].--The spoke design (not shown) provides for a continuous belt without physical divisions

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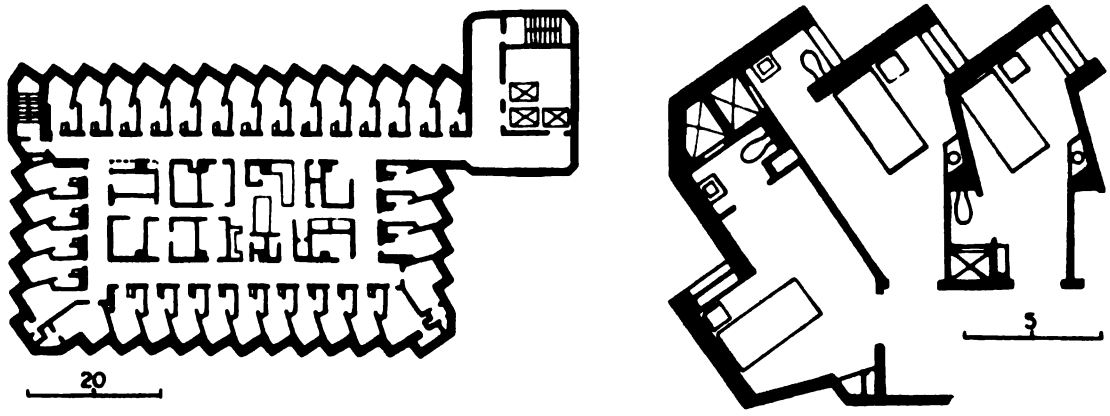
[4]Ibid.

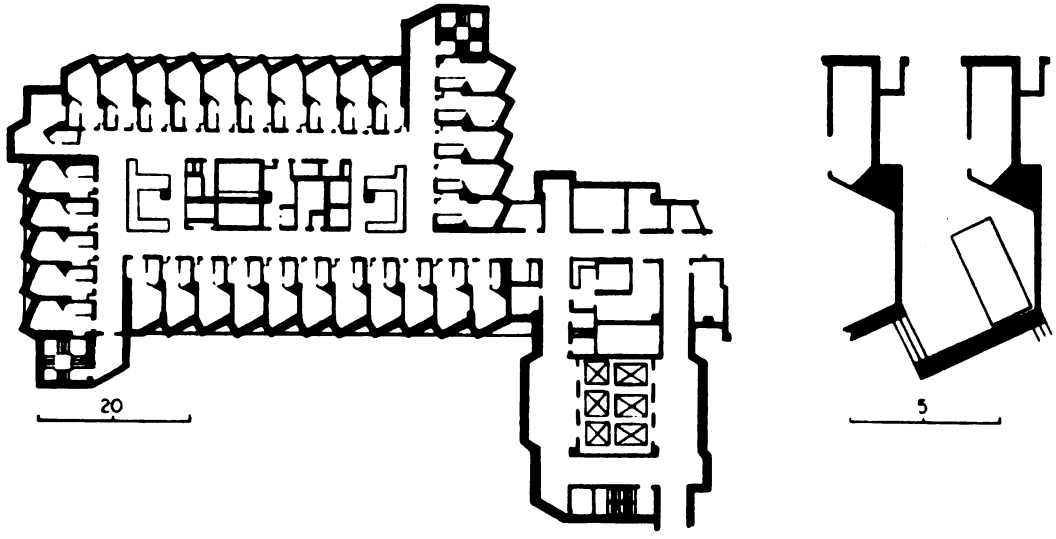
[5]"A Systems-Analysis Approach to Hospital Design," Architectural Record (March, 1970), 113.

[6]Sherman Morss, "Architect's Note," Health Service Research (Fall, 1970), 226-27.



Compact, Single
Rectilinear With Saw Tooth Parameter, Centinella Valley, Inglewood, Cal. (1969).
Welton Becket And Associates

Fig. 10



Compact, Single
Rectilinear With Saw Tooth Parameter St. Vincent's, Los Angeles, (1970).
Daniel, Mann, Johnson and Mendenhall

Fig. 11

into conventional nursing unit. It allows for flexibility between departments with separation of inner and outer belt leaving patient area more quiet. Support facilities and visitor rooms are spaced along the belt at various intervals.

Circulation

The above architectural types demonstrate that the nursing service/in-patient care units are and have been based on circulation and the functions of the hospital. The many departments are properly integrated so that different types of traffic through the building will be separated as much as possible, traffic routes will be short, and important functions protected against intrusion. Circulation can determine the efficiency of a hospital for the life of the institution.[7]

Principles

1. Protect the patient; limit nursing traffic noise; and limit risk of contamination.
2. Shorten traffic routes with as much separation as possible; limit contamination, limits, cost, and fatigue.

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[7]Emerson Goble, "Hospital Planning Starts with Circulation," Hospitals, Clinic and Health Centers (F. W. Dodge Corporation, 1953), p. 2.

3. Separation of dissimilar activities; clean from dirty, types of patients, quiet and noisy, and various types of traffic.

4. Control; supervision of: patient corridors by nurses' station, contamination from outside.

The intent is to separate departments yet keep horizontal travel to a minimum. Standard schemes are lacking because of a wide variety of individual conditions and site criteria which exist.

The Population

Staff

The staff of the nursing service/in-patient care unit is made up of the same elements as those of the hospital staff. The greater percentage of the hospital staff have only an indirect influence on the nursing unit. The physician, nurse, and housekeeper are usually the only members of the hospital staff to have a direct influence on the nursing service/in-patient care unit for they directly influence the patient and the patient rooms which make up the nursing service/in-patient care unit.

Consumer/Patient

In the nursing service/in-patient care unit the consumer/patient consumes the services provided by the unit. There is little if any feedback to the hospital of his feelings of his environment or his general well-being. The consumer/patient is treated for medical symptoms and provided treatment for the "cure" of those symptoms. The consumer/patient faces the psychological attitudes of the nursing service/in-patient unit as well as his own psychological attitudes.

Psychology of the Physical Environment[8]

Psychological Attitudes of the Nursing Service/In-Patient Unit.--The psychological attitudes of the nursing service/in-patient unit are: formulate and control structures in hospital processes, communications and function, formulate and maintain patient identity, and acknowledge that patient and staff are transitory and composed of two different groups.

Psychological Communication Vectors of the Consumer/Patient.--The psychological communication vectors of the consumer/patient (Figure 12) are: back wall security, close service [immediate bedside (armside)],

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[8]Robert Propst, Herman Miller Health Care Conference Three, December 6, 7, 8, 1971.

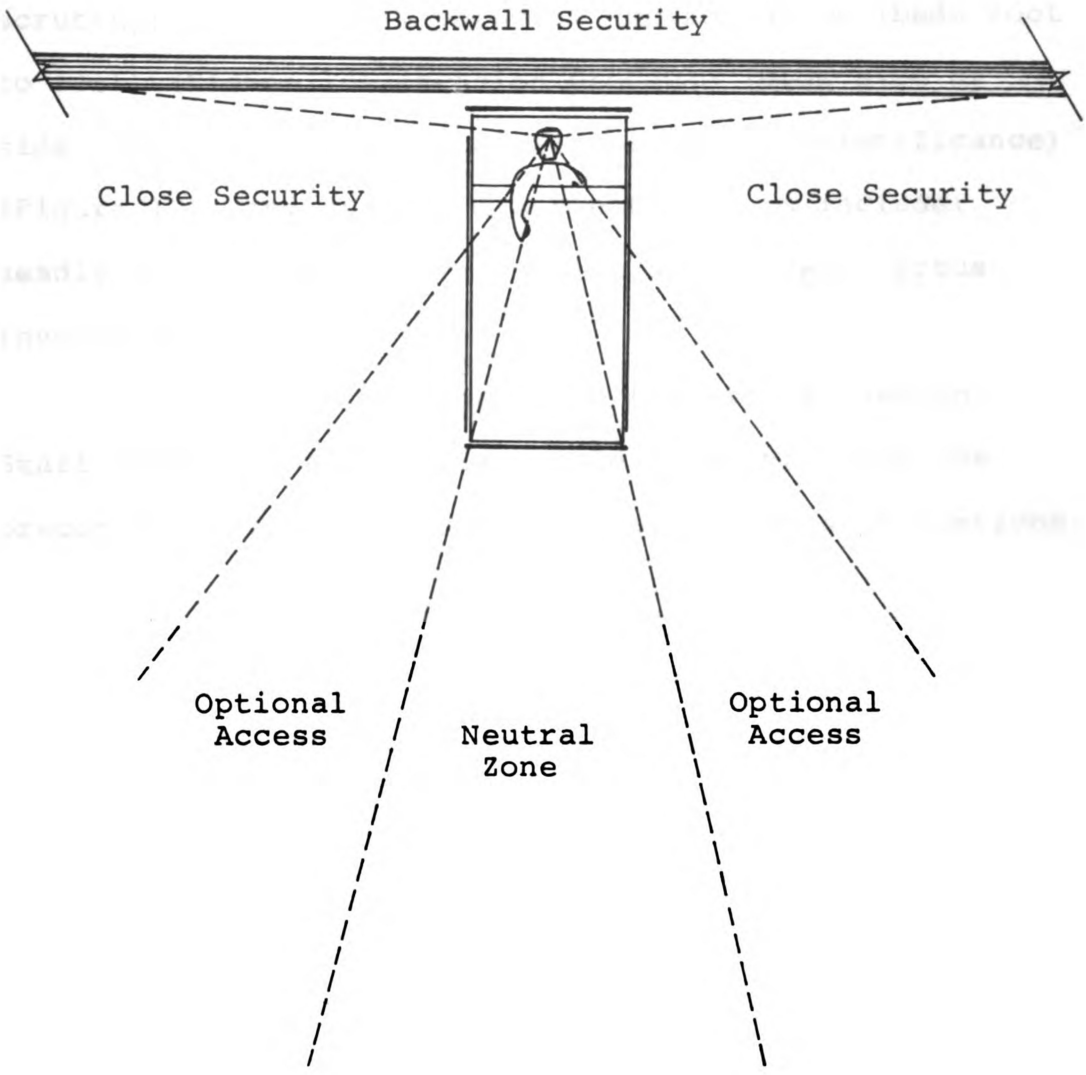

Figure 12. Psychological Communication Vectors

optional access (bedside, legside), neutral zone (foot of bed).[9]

Psychological Consumer/Patient Situations.--Psychological consumer/patient situations are: closed up (no visual access) (Figure 13), overexposed (constant scrutiny) (Figure 14), personal confrontation (beds foot to foot) (Figure 15), tension produced (beds side by side) (Figure 16), overscale (feeling of insignificance) (Figure 17), and spatial disorientation to include: deadly silence versus great noise and privacy versus involvement.

Compromise must be found for each situation. Staff must play an important role in maintaining the precarious balance of the above psychological situations.

Constraints

The design of the nursing service/in-patient care unit has basically the same constraints as the hospital system. Different from the two previous systems the constraints of this system generally have a more direct influence on the patient.

The most important point to realize is how little is known about the patient rooms which make up the nursing service/in-patient care unit. The needs of the patient and/or the requirements of the room are generally

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[9] Ibid.

Psychological Situations

Closed Up

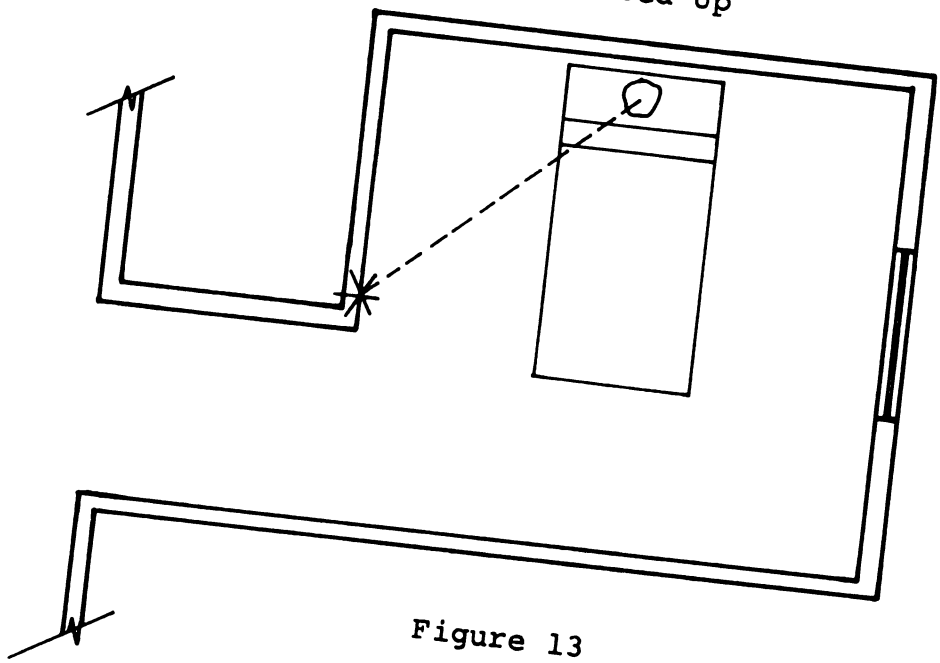
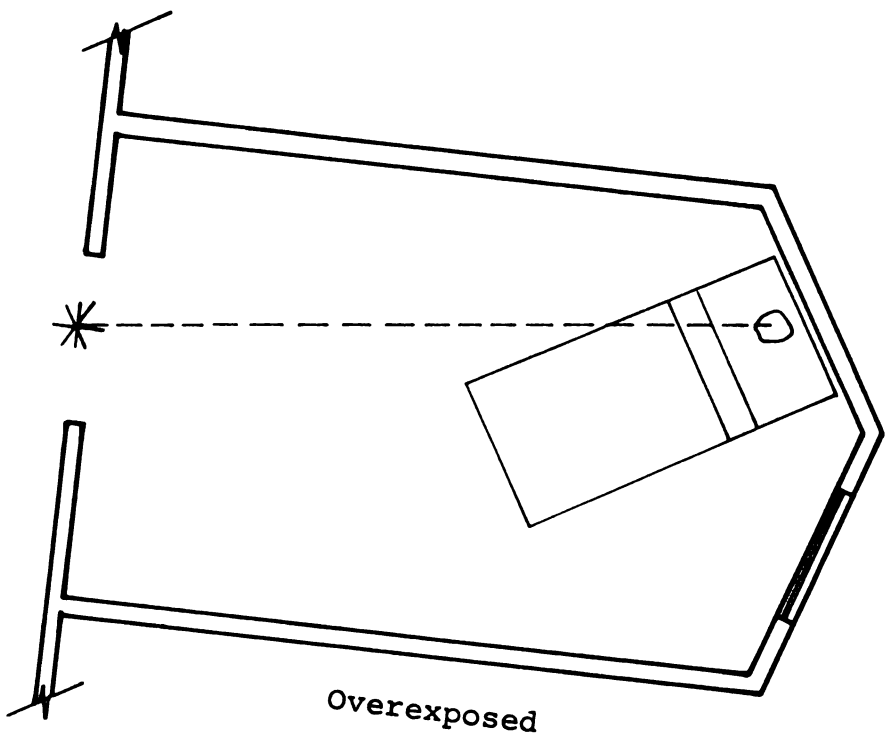


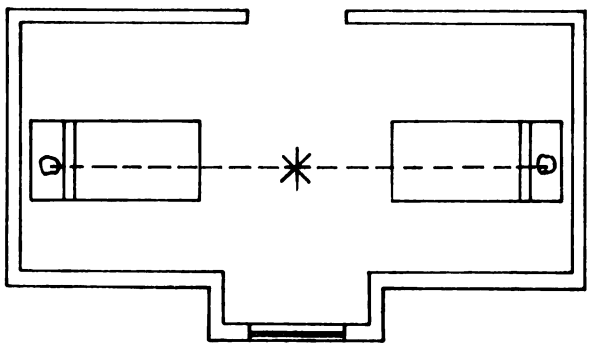
Figure 13



Overexposed

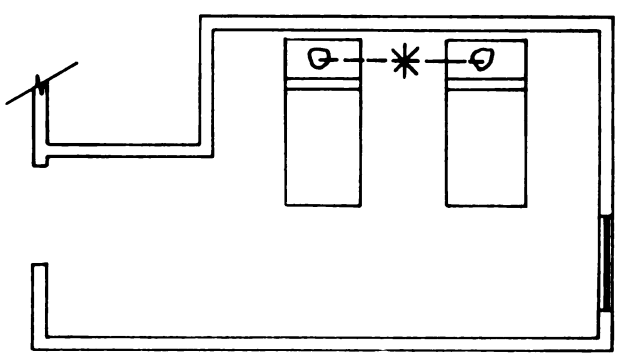
Figure 14

Psychological Situations



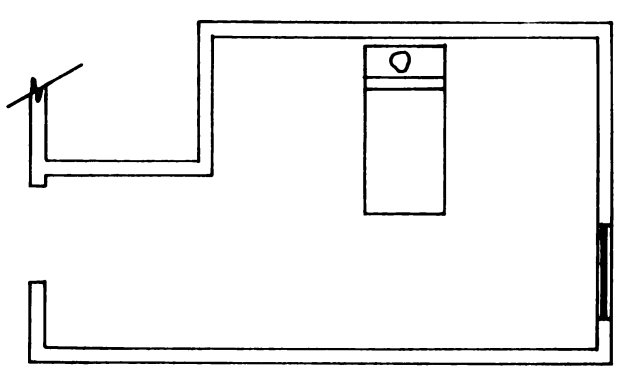
Personal Confrontation

Figure 15



Tension Produced

Figure 16



Overscale

Figure 17

unsubstantiated. The following needs/requirements are usually assumed: a bed, a window, a side service table, a chair, life support equipment, and access to lavatory and toilet facilities.

In making such assumptions, self-imposed constraints are placed upon the design of the patient room and the nursing service/in-patient care unit. Why not have rooms without windows? Is there a better solution than a bed? What "furniture" and equipment is actually needed for the patient? What is usually assumed to be the needs is an uncertainty. Thus, the patient room and the nursing service/in-patient care unit are further constrained by a tremendous lack of knowledge.

CHAPTER V

THE PROPOSED HEALTH CARE SYSTEM AND ITS EFFECT ON THE HOSPITAL AND NURSING SERVICE/IN-PATIENT CARE UNIT

The writer's original objective of this thesis was to design an improved in-patient care room. The review of literature indicated that in order to achieve this objective it would be necessary to have a firm understanding of the health care system. Further research of the health care system disclosed a fragmented system lacking in continuity and supportive research. It is the writer's belief that an improved in-patient care room cannot be designed without first designing an improved health care system.

The Proposed Health Care System

The proposed health care system will require a great deal of change in the present health care system and will necessitate intensive research in order for the system to succeed. The proposed health care system could provide health care for all persons, both potential and

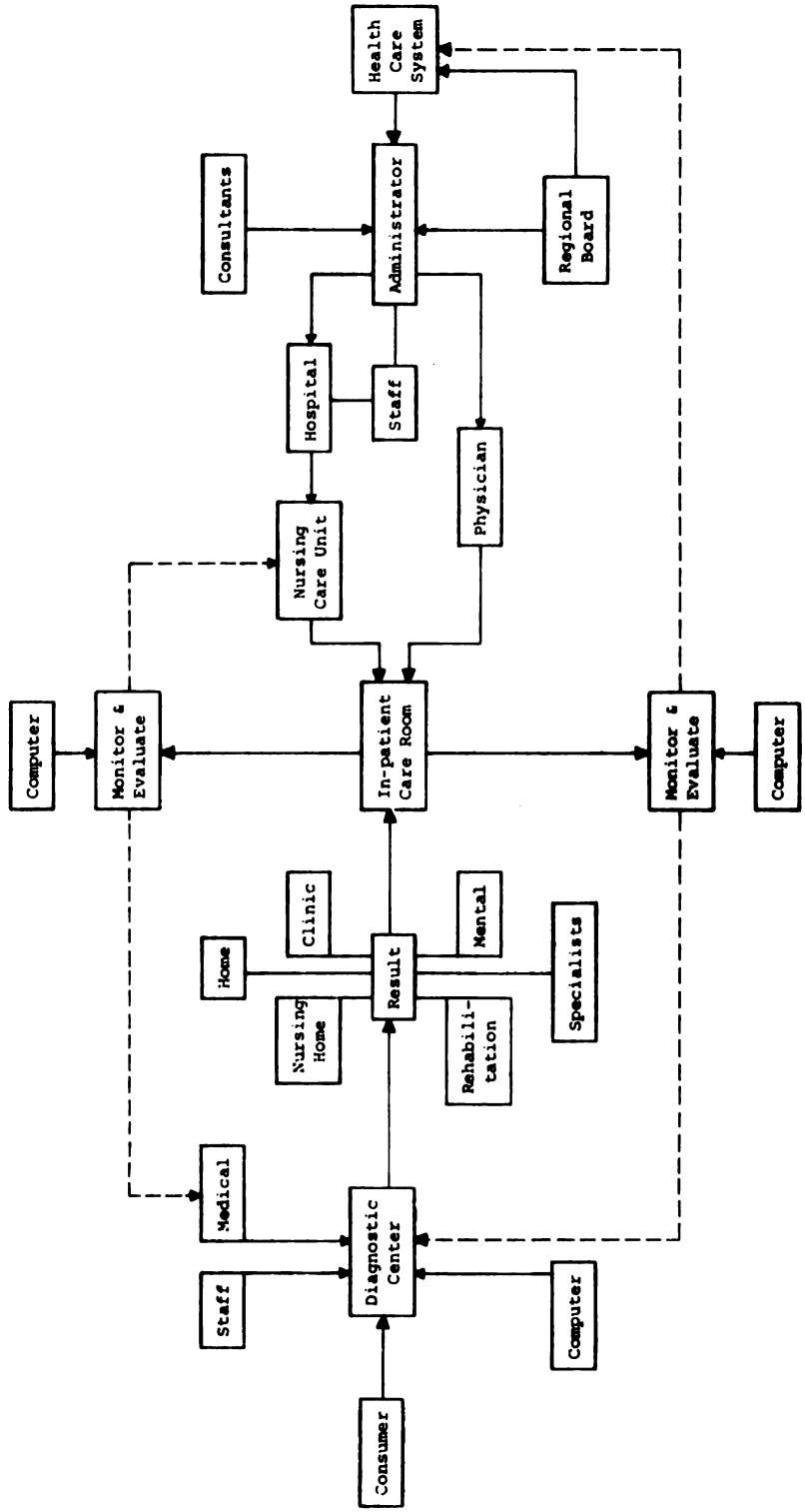


Figure 18. Proposed Health Care System

actual consumers, as well as providing a continuity of the health care system and a constant evaluation of the proposed system.

Components of the Proposed System

Diagnostic Screening Center

The diagnostic screening center is considered by the writer to be one of the main components of the new system.

Location.--Though this center could be located anywhere within the health care system, the writer believes that it would best be located at the community neighborhood level. This would allow for immediate interaction with the community and preferably the neighborhood the center is to serve.

Staff.--The majority of the staff in the diagnostic center would be made up of intermediate medical technicians trained to run the tests necessary for a physician to make a proper diagnosis. Additional staff would be engaged in counseling and educational capacities of health care. Physicians and nurses would also comprise a portion of the staff based on the theory of group practice.

Computer.--The computer of the diagnostic center would be linked to a nation-wide computer system providing all medical records including patient medical histories.

Thus, no matter what diagnostic center a patient attended his records would always be kept intact and up-to-date.

Medical.--The medical input to the diagnostic clinic would come from both the center's physicians and the computer.

Result

The center's diagnosis of the patient would create variable results. The patient might be sent to an institution, sent home, or treated as an outpatient at the neighborhood clinic. The advantage being, if the patient is to be sent to an institution, such as a hospital, all the admission procedures would be completed at the diagnostic center, thus, eliminating some of the fear and confusion often associated with initial entry into an institution. The admission process would be expedited with the use of the computer. It would be much like reserving a room at a hotel.

The proposed system would use many of the institutions established under the present health care system. Unlike the present health care system, the proposed system would have the capability of monitoring and evaluating the performance of the system. How the monitoring will be accomplished is not yet known since it must be based on further research. The writer believes it is conceivable to assume that this monitoring will in some

form depend on the computer centers for support. The evaluation of the monitored data will be accomplished as follows.

The Monitoring and Evaluation System

The monitoring and evaluation system is made up of seven main parts. These are the following: (1) input, (2) translation, (3) analysis, (4) trade-off study, (5) synthesis, (6) evaluation, and (7) output.

Input.--The input is merely the information or data collected by the monitoring capabilities. The following situation might occur and be monitored. The linen used in the acute care in-patient care units is changed at the rate of twice a day. The storage and laundry services are no longer adequate to meet the demand and disposable linens are suggested as a folution.

Translation.--Translation is merely the phase at which point the objectives are brought together with the absolute constraints. In the case of the example presented the following might occur: the objectives are to provide a clean, pleasant atmosphere for the patient. This would also imply that a secondary objective would be to isolate the patient's condition if it can be made communicable by the linens used in his environment. The absolute constraints might be that each patient is limited

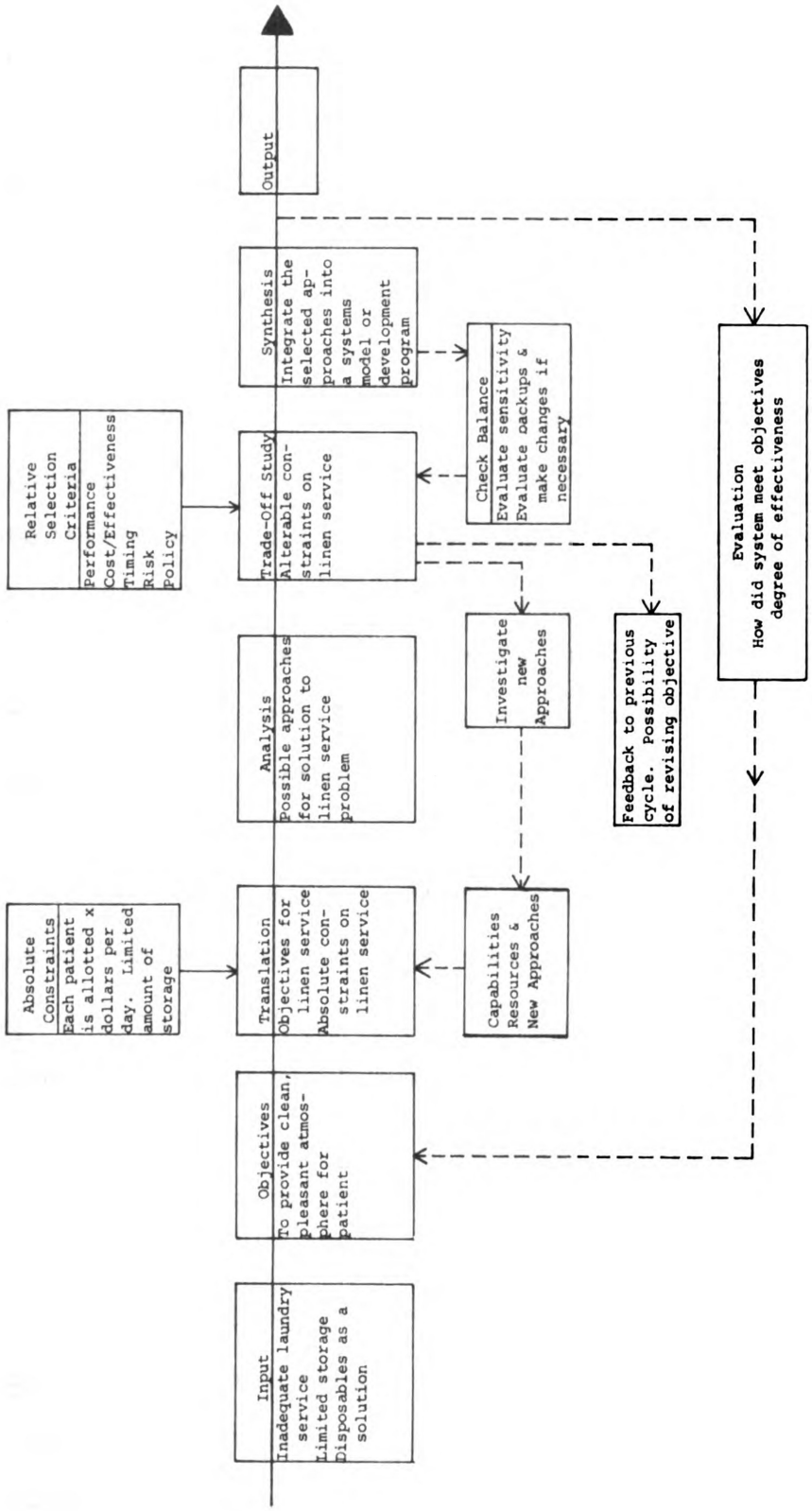


Figure 19. Evaluation and Monitoring System

to a certain amount of money per day for linens and that there is a limited amount of storage.

Analysis.--In the analysis phase possible approaches are developed for attaining the objectives. In the case of the example the following might occur. A complete change to disposable. The use of outside laundry facilities to provide the needed linen which cannot be produced within the hospital. An increase in the size of laundry facility which would also include an increase in storage area within the laundry facilities.

Trade-off Study.--The trade-off study is the phase in which the relative criteria is brought into play. The relative criteria will usually contain such things as: performance, cost/effectiveness, timing, risk, and policy. In the case of the example the following might occur: the performance, and cost/effectiveness of reusable linens versus disposable linens are comparatively equal. The change over to disposables would solve the adequacy problem since the old laundry facilities could be used for additional storage area. This solution, however, would create the additional problem of increased waste which the hospital could not handle without an increase in the waste removal system, a cost which would be too great to offset the solution. To increase the waste removal system would also take too long as would increasing the present laundry facilities. There is also a risk involved by increasing

the laundry facilities. The construction time would be two years and there is no projected data available on how large the facility should be to be adequate at the end of the two-year period. The solution then becomes to obtain the services of an outside laundry facility. The cost is low enough to offset the solution. The outside laundry facility would also solve the problem of storage since delivery and pickup would be made on a daily basis.

At this point if no solution had been found the following would occur. A feedback to the translation phase would occur. There would be an investigation of new approaches, capabilities, and possible new resources which could be input into the system in order to find a solution. There might also be a revision of the objectives.

Synthesis.--The synthesis phase integrates the selected approach into the present system. At this point evaluation is made of the solution as to its performance, backups, etc., and any changes are made if necessary.

Evaluation.--Evaluation is made of the solution as it affects the entire system. Evaluation is also made of the solution and how it meets the objectives of the system. When this evaluation is completed the service or product is ready to be put into the system.

Output.--The output is the product of the entire process which has been described. In the case of the

example presented the output would be an increase in linens provided to the in-patient care unit.

The remaining portion of the proposed system is much like that of the present system with some changes which will be discussed under the perspective headings. Similar institutions will still exist with basically the same staff. The consumer will have become the center around which the health system exists. It must also be noted that the changes being called for are radical changes and it is not expected that these changes can occur in a matter of a few months or years. Improvements and changes must be both radical and immediate if health care is to improve at all with the consumer as its main concern.

Effect on the Present Health Care System

The proposed system would create continuity in the health care system which is lacking in the present system. The continuity, in part, would be created by the use of the central computers. This continuity would be further supported by the monitoring and evaluation system. Facts and information from the entire country would be more accessible, presumably at a much faster rate.

The consumer will no longer be thought of as just the patient. The neighborhood diagnostic clinic would place a greater emphasis on preventive medicine and health care education.

The manpower shortage could somewhat be alleviated with an influx of intermediate medical technicians who would be utilized to carry the bulk of the work load. This would allow the physician to perform the services he was intended to perform.

The proposed system in no way is calling for socialism as a reform. The proposed system would be administered by many of the established organizations already involved in health care. These would be: H.E.W., Hill-Burton program, A.M.A., A.I.I., A.H.A., Department of Public Health, A.N.A., Joint Commission of Hospital Accreditation. The aforementioned organizations are but a few of the organizations which could participate in the administration of the proposed system. The large insurance companies could also be influential in the operation of the proposed system by acting as financial clearing houses for the consumers. The writer believes that the diagnostic centers would best be controlled by a regional board; all the revenues going to this board would be redistributed equally.

Effect on the Present Hospital System

The present hospital system will remain virtually unchanged in its physical appearance at the beginning of implementation of the proposed system. The same physical plants will exist but with new organizational practices. The administrator, who would be directly responsible to a

regional board, will be the primary decision maker in the hospital system using a group of consultants to aid him. Since this board will be the same board in charge of the neighborhood diagnostic centers it will have the capability of evaluating what is actually needed by the communities and how the hospital can best function to meet those needs. The writer believes the departmentation in the hospital system can also be broken up into larger categories in which all present departments would then be represented by heads of these categories who would then be directly responsible to the administration.

With the admissions being taken care of in the neighborhood center the consumer/patient would only have to register and be shown to his room. With additional research conducted with the aid of monitoring, the patient room and the entire hospital system should improve due to direct input from both patient/consumer and staff.

Like the health care system the hospital system will have an increase in intermediate medical personnel. The nurse will be most favored by this since she will then be allowed to perform the tasks she has been trained for. The consumer/patient will also benefit since the intermediate medical staff would have the capability of giving closer personal attention to him. This method of organization could also increase efficiency in the hospital since hospitals would have the use of the central computer service.

By using the central computer service greater competition should develop among hospital product and equipment manufacturers. Once the system is established the computer could carry reports on products as to their uses, capabilities, and faults; and hospital personnel could see at a glance the range of available products. Defective or substandard equipment would be eliminated. The computer could also contain information on used equipment so that any hospital unable to afford new could have an outlet for purchasing used equipment.

The physician would also be favored in the proposed system. He would have a greater amount of time for the actual treatment of the patients.

The entire hospital care system would be able to direct more of its attention toward the consumer/patient. The organization change would help this direction of attention. Financially the patient would not be plagued with the anxiety of how much all the services were costing. The hospital services could be provided through the neighborhood diagnostic centers and regional boards. Each consumer/patient would pay a pro-rated monthly fee which would be proportionately much less than what consumers are paying today.

Effect on the Present Nursing Service/ In-Patient Care Unit

The most significant effect on the nursing service/ in-patient care unit is that for the first time the patient will have the opportunity by the use of the evaluation system, to make his reaction known to someone other than the physician, nurse, or housekeeper. This would be accomplished through monitoring the patient and his environment. How this will be accomplished is not yet clear though it will probably involve the use of the computer and a research team. Each of the patient/ consumer's reactions will have some impact on what is done to improve the present system. Further, the vitally needed research can be accomplished from the source, that is through the patient, rather than through second-hand knowledge.

This explanation of the proposed system is obviously overly simplified. The details of such a system will take extensive research in order for it to succeed. The writer is aware of this fact but believes the idea has merit for the following reasons. It will develop a continuity in the field of health care and aid in providing some of the research needed to improve the quality of health care. Finally, the system will constantly be changing and updating due to its built-in monitoring and evaluation system.

CHAPTER VI

SUMMARY

It has been learned through this study that the design of a patient room cannot be initiated without a complete understanding of the health care system in which the room exists.

The investigation of the health care system found a situation which is fragmented by a multitude of local institutions. Further examination proved the hospital system to be similarly fragmented by departmentalization. The nursing service/in-patient care unit and the patient room suffer due to this fragmentation. With a lack in continuity the health care system is unable to define the problems which exist within it.

The health care system was found not to be oriented to the consumer/patient. Rather, the consumer/patient is only a by-product of the health care system. This is the point from which the health care system should start, that is, the consumer/patient.

The writer also found no means with which the present system could evaluate itself. Therefore, there could be no rationale on which change could be initiated.

The writer believes a complete revision of the health care system is necessary. The proposed system is a means by which the health care system could be revised.

Once the revision of the health care system has been started, further research can be initiated to study the needs of the consumer/patient. In the past designers, and other persons involved in health care have only been able to assume the needs of the patient. It is assumed the patient needs a bed, a window, a certain amount of space, a certain amount of light, a certain amount of color, a certain amount of privacy, etc. These assumptions are probably correct in their intent. There is generally no substantial data to indicate how much or to what degree any one thing is needed. The writer believes that these assumptions should be questioned. Is a window necessary for a patient who might have no desire to view the outside world? What furniture is really needed in the patient room? These questions have gone unanswered or have never been asked.

When research has been attempted concerning the needs of the patient it has been done under conditions where the patient was not transit. This research has usually taken place in mental institutions or in

tuberculosis institutions. The writer believes that these assumptions to a great degree, have caused health care to become outmoded and basically rigid to change.

This study has found few solutions but has opened the door to a multitude of subjects for research projects such as: the needs of the patient, new forms of monitoring the patient, organizational approaches, materials used within the hospital, planning the neighborhood center, and many more. Further study could also be conducted in methods of this research, in the implementation of computers, and the education of the consumer.

If the health care system is ever to improve it must be started now. There is no time to be lost in theorizing on the need of such investigation. The need has already reached crisis level. It must further be realized that the present health care system is inadequate and that only a radical change can rectify this situation.

The main objective of a new system must be the consumer/patient based on preventive health care rather than on cure.

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APPENDICES

APPENDIX 1

DEFINITION OF LEVELS OF HEALTH FACILITY AND RELATED INSTITUTIONAL CARE

APPENDIX 1

DEFINITION OF LEVELS OF HEALTH FACILITY AND RELATED INSTITUTIONAL CARE

(Including Illustrative Services to Indicate Need for or Provision of a Specific Level of Care)

ASSOCIATION OF DIRECTORS OF STATE AND TERRITORIAL HEALTH FACILITY LICENSURE AND CERTIFICATION PROGRAMS

October 2, 1970

Five levels of health facility and related institutional care can be defined consistent with accepted professional health and medical care concepts and practices as well as current health programs and legislation. They are:

1. Institutional room and board
2. Intermediate supervised personal care
3. Intermediate nursing care
4. Skilled nursing care
5. Hospital care

Individual levels of health facility and related institutional care are defined below in terms of specific

characteristics and illustrative services that serve to indicate a need for or provision of an individual level of care.

The characteristics and illustrative services specified for each level of care are not intended to be all-inclusive. Neither, are these characteristics and illustrative services intended as standards for the evaluation of quantity or quality of care needed or provided.

It must be emphasized, particularly in the evaluation of an individual's care needs, that these criteria must not be applied as rigid standards but only as a guide to the exercise of professional judgment by physicians, nurses, and other health professionals.

Institutional Room and Board

Institutional room and board such as that provided in certain domiciliary facilities has but is not limited to the following characteristics:

1. Services emphasize and are limited to the provision of room and board to residents who are otherwise independent. This level of care is required primarily for social and/or economic reasons that prevent the individual from remaining in the setting of a private home.

2. Physician and other medically needes services are the responsibility of the individual in accord with self-determined needs.

Intermediate Supervised Personal Care

Intermediate supervised personal care, such as that provided in homes for the aged, personal care homes and comparable facilities, has but is not limited to the following characteristics:

1. Care and services emphasize supervision, protection, assistance and personal care but do not include nursing care.

2. Physician services are provided on an emergency basis or as arranged for individual residents either in or out of the facility. Routine medical care is usually on an outpatient basis.

3. Care and services throughout each 24-hour period are directed by competent and responsible non-professional individuals with training and experience in providing care and services to meet the particular needs of aged individuals and others with limited capacities not requiring continuing nursing care.

4. The average stay is usually long-term, but in each case, according to individual needs.

A regular and continuing need for or provision of the following illustrative services is characteristic of intermediate supervised personal care:

1. Personal supervision and protection from environmental and other hazards.
2. Regular diets, including modifications, and therapeutic diets.
3. Supervision and assistance, if needed, with personal care including care of skin, mouth and teeth, hands and feet; shampooing and grooming of hair; tub and shower baths.
4. Stimulation of or assistance in activities of daily living and physical exercise according to individual capabilities and needs.
5. Diversional and motivational activities.
6. Basic social services provided by facility staff.
7. Emergency and arranged medical care in accord with written policies and procedures of the facility.

Intermediate Nursing Care

Intermediate nursing care, such as that provided in nursing homes, medical care facilities and hospital long-term care units, has but is not limited to the following characteristics:

1. Care and services emphasize basic nursing care and services under the direction of a physician.
2. Physician attendance for each individual in the facility is required at least every ninety days and more often when medically necessary (as determined by the attending physician).
3. Nursing care is under the direction of a registered nurse or licensed practical nurse.
4. The average stay is usually long-term but, in each case, according to individual needs.

A regular and continuing need for or provision of the following additional illustrative services is characteristic of intermediate nursing care:

1. Proper use by patients of bed, wheelchair or other accommodation.
2. Supervision or aid in bathing and personal hygiene, including bed baths.
3. Prevention and treatment of skin irritation and treatment of uncomplicated decubitus ulcers.

   Prevention of skin irritation and decubitus ulcers in selected individuals may justify a need for skilled nursing care. The need for skilled nursing care must be documented and justified in the patient's record.

4. Observation of vital signs and routine recording of findings in patient's record.

5. Assistance and training in self-care as required for feeding, grooming, ambulation and toilet activities and other activities of daily living.

6. Assistance and training in patient transfer techniques and mobilization activities (bed to wheelchair, wheelchair to commode, etc.).

7. Range of motion exercises as part of routine maintenance nursing care.

8. Administration of topical, oral, and selected injectable medications. Injectable medications should be administered by licensed nursing personnel.

9. Administration of oxygen on an emergency or short-term basis.

10. Use of intermittent positive pressure breathing equipment and nebulizers.

11. Simple dressings and routine care of patients with temporary casts, braces, splints or other appliances requiring nursing care or direction.

The presence of a plaster cast, brace, splint or other appliance does not ordinarily require skilled nursing care unless there are associated

conditions or specific complications present to justify this level of care. The presence of the associated conditions or specific complications as well as the need for skilled nursing care must be documented and justified in the patient's record.

12. Use of protective restraints, bed rails, binders and supports as ordered by a physician or provided in accord with written patient care policies and procedures.

13. Arrangements for obtaining promptly and conveniently clinical, laboratory, X-ray and other diagnostic services.

Skilled Nursing Care

Skilled nursing care such as that provided in nursing homes, medical care facilities and hospital long-term care units, has but is not limited to the following characteristics:

1. Care and services emphasize a high level of nursing direction, observation and nursing skills under the direction of a physician.

2. Physician attendance for each individual in the facility is required at least every thirty days and more often when medically necessary as determined by the attending physician.

3. Nursing care is under the direction of a registered nurse and, throughout each 24-hour period, is in charge of a registered nurse or licensed practical nurse. An adequate number of licensed nurses must be on duty at all times to meet total patient care needs.

4. The average stay may be short-term or long-term according to individual needs.

A regular and continuing need for or provision of the following additional illustrative services is characteristic of skilled nursing care:

1. Administration of potent and dangerous injectable medications and intravenous medications and solutions on a regular and continuing basis.

2. Restorative nursing procedures such as gait training and bowel and bladder training in the case of patients who are determined to have restorative potential and can benefit from the training.

3. Nasopharyngeal aspiration required for the maintenance of a clear airway.

4. Maintenance of tracheotomy, gastrostomy and other tubes indwelling in body cavities.

The insertion and maintenance of a urethral catheter as an adjunct to active rehabilitation or treatment of disease of the urinary tract may justify a need for skilled nursing care. However, the mere presence of a urethral catheter, particularly one placed for convenience or the control of incontinence, does not justify a need for skilled nursing care. In all instances, the urethral catheter must be ordered by a physician and the need documented and justified in the patient's record.

Colostomy may require skilled nursing care during the early post-operative period. However, maintenance care of a colostomy does not usually justify skilled nursing care.

5. Administration of tube feedings.

6. Administration of oxygen or other medicinal gases on a regular or continuing basis in the presence of an unstable medical condition.

7. Other specified and individually justified services, including skilled nursing observation of unstable medical conditions required on a regular and continuing basis which can only be provided by or under the direction of trained medical and licensed professional nursing personnel. The need

for these services must be documented and justified in the patient's record.

Hospital Care

Hospital care such as that provided in acute care general hospitals and certain specialty hospitals, has but is not limited to the following characteristics:

1. Care and services emphasize care under the daily direction of an attending physician. The medical staff and the individual physician function in accord with formally adopted medical staff bylaws, rules, and regulations.

2. Nursing care and services offer skilled nurse direction and participation to assure the availability of nursing skills necessary to carry out physician's orders, to provide close observation, and to provide for the individual's nursing care needs.

3. Nursing care is under the direction of a registered nurse, and, throughout each 24-hour period is in charge of a registered nurse. An adequate number of registered nurses must be on duty at all times to meet total patient care needs.

4. Average stay is usually short-term but according to individual needs.

A regular and continuing need for or provision of the broad spectrum of additional professional techniques and ancillary services found in a hospital are characteristic of this level of care.

Physical Therapy

Physical therapy is a non-nursing service that may be required by any individual regardless of his other care needs. Thus, physical therapy may appropriately be provided to a resident in an intermediate supervised personal care facility or a patient in an intermediate or skilled nursing care facility or a hospital. Physical therapy services should always be ordered by a physician and directed and provided by qualified personnel. The need for or provision of physical therapy is not an indication in itself of a need for a specific level of care.

APPENDIX 2

THE HILL-BURTON PROGRAM

AND THE STATE PLAN

APPENDIX 2

THE HILL-BURTON PROGRAM

The Hill-Burton program, as amended, provides for federal grants, appropriated and allocated annually to the states and territories, to assist non-profit and/or government organizations in the construction and modernization of health facilities. Construction projects eligible for such partial financing include general hospitals, long-term care facilities, nursing homes, and chronic disease hospitals, public health centers, rehabilitation centers, outpatient facilities, mental hospitals, and facilities which are functionally and administratively related to a hospital or public health center.

The Medical Facilities Construction and Modernization Amendments of 1970 authorize appropriations through 1972-73. The funds so appropriated are allocated to the states and territories by means of a legislative formula containing elements of population and per capita income.

The Department of Health, Education and Welfare is designated as the administrative federal agency and is charged with the development of regulations to supplement

and implement the legislation. The regulations are known as "Public Health Service Regulation--Part 53, pertaining to the Construction and Modernization of Hospital and Medical Facilities."

Each state and territory must designate a single state agency for the administration of the plan which must be revised annually. The initial plan and all subsequent revisions must be approved by the Secretary of Health, Education and Welfare prior to approval of any applications for grants for the project construction encumbering funds from that year's allocation.

THE STATE PLAN

Typical Example, Michigan

The State Plan is a public document for guiding and influencing the development of patient care service through the construction and modernization of hospitals and related medical facilities serving each area of the state, including interstate areas. It describes the present system of hospitals and related health facilities serving each area of Michigan, and presents a coordinated, comprehensive program for the orderly development of need health services and facilities designed to assure high quality patient care. It serves as the basis for the allocation of funds from all sources for modernization and construction purposes as well as public grants-in-aid

funds intended for these purposes. In general, it is a reflection of health facility planning by the Michigan Department of Public Health, in cooperation with other planning agencies in the state, and always with the help of the health facilities which annually supply certain essential statistics and service data.

APPENDIX 3

CODES AND STANDARDS

APPENDIX 3

CODES AND STANDARDS

7-1 General

Nothing stated herein shall relieve the sponsor from compliance with building codes, ordinances, and regulations which are enforced by city, county, or State jurisdictions. Where such codes, ordinances, and regulations are not in effect, it shall be the responsibility of the sponsor to consult one of the national building codes generally used in the area for all components of the building type which are not specifically covered by the minimum standards set forth herein provided the requirements of the code are not inconsistent with the minimum standards herein.

7-2 List of Referenced Codes and Standards

The following codes and standards have been utilized in whole or in part as references in the sections of this publication in parenthesis:

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Handbook of Fundamentals (secs. 8-23C1, 8-24J4c, 9-17C1, and 9-18H4c) $15.00.

American Society for Testing and Materials (ASTM) Standard No. E 84-61, Method of Test for Surface Burning Characteristics of Building Materials (secs. 8-22E and 9-16E) $1.00

American Society for Testing and Materials (ASTM) Standard No. E 90-66T, Recommended Practice for Laboratory Measurement of Air-borne Sound Transmission Loss of Building Floors and Walls (Tentative) (secs. 8-20A15, table 1 and 9-14A19, table 3) $1.00.

American Society for Testing and Materials (ASTM) Standard No. E 119, Methods of Fire Tests of Building Construction and Materials (secs. 8-22D and 9-16D) $1.00.

Federal Housing Administration (FHA) Publication No. 750, Impact Noise Control in Multi-family Dwellings (secs. 8-20A15, table 1 and 9-14A19, table 3) 50 cents.

International Standards Organization (ISO) Recommendations No. 140-1960, Field and Laboratory Measurements of Airborne and Impact Sound Transmission (secs. 8-20A15, table 1 and 9-14A19, table 3) $2.40.

National Bureau of Standards (NBS) Handbook 73, Protection Against Radiation from Sealed Gamma Sources (secs. 8-20A11b and 9-14A15b) 30 cents.

National Bureau of Standards (NBS) Handbook 76, Medical X-ray Protection up to Three Million Volts (secs. 8-20A11a and 9-14A15a) 25 cents.

National Electrical Manufacturers Association (NEMA) Bulletin No. XR4-10, Minimum Power Supply Requirements (sec. 8-24G2) No charge.

National Fire Protection Association (NFPA) Standard No. 70, National Electrical Code (sec. 8-24G2) $1.00.

National Fire Protection Association (NFPA) Standard No. 56, Code for the Use of Flammable Anesthetics (secs. 8-20B2, 8-23D2s, 8-24F1 and G1, and 9-14B2) 75 cents.

National Fire Protection Association (NFPA) Standard No. 82, Standard for Incinerators (secs. 8-23B and 9-17B) 50 cents.

National Fire Protection Association (NFPA) Standard No. 10, Standards for the Installation of Portable Fire Extinguishers (secs. 8-20A14 and 9-14A18) 60 cents.

National Fire Protection Association (NFPA) Standard No. 101, Life Safety Code (secs. 8-20A1 and 9-14A1) $1.50

National Fire Protection Association (NFPA) Standard No. 565, Standard for Nonflammable Medical Gas Systems (secs. 8-23E6 and 9-17Ey) 50 cents.

Public Health Service (PHS) Publication, Labor Standards Provisions for Construction Grant Programs (sec. 6-3B7) (Available only at no charge from the Division of Hospital and Medical Facilities, Willste Building, Silver Spring, Maryland 20910).

Public Health Service (PHS) Publication No. 934, Food Service Sanitation Manual (secs. 8-12 and 9-7) 55 cents.

Public Health Service (PHS) Publication No. 1038, Report of Public Health Service Technical Committee on Plumbing Standards (secs. 8-23E and 9-17E) 45 cents.

Underwriters' Laboratores, Inc. (UL) Publication No. 181, Air Ducts (secs. 8-23D2j and 9-17D2h) No charge.

United States of America Standards Institute (USASI) Standard No. A117.1-1961, American Standard Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped (secs. 8-1B and 9-1B) $2.00.

7-3 Availability of Codes and Standards Listed

Copies of non-Government publications can be obtained from the various agencies at the addresses listed below.

American Society of Heating, Refrigerating and Air-Conditioning Engineers
United Engineer Center
345 East 47th Street
New York, New York 10017

American Society for Testing and Materials
1916 Race Street
Philadelphia, Pennsylvania 19103

International Standards Organization
(USA Headquarters, United States of America Standards Institute)
10 East 40th Street
New York, New York 10016

National Electrical Manufacturers Association
155 East 44th Street
New York, New York 10017

National Fire Protection Association
60 Battermarch Street
Boston, Massachusetts 02110

Underwriters' Laboratories, Inc.
207 East Ohio Street
Chicago, Illinois 60611

United States of America Standards Institute
(Formerly American Standards Association, Inc.)
10 East 40th Street
New York, New York 10016

Except as noted in the list, copies of Government publications can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.