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The Bedless Hospital: A New Medical Facility Type

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Go to Article

Due to the rapid changes healthcare is undergoing, the nature of the facilities in which medical care is being delivered are changing. In response to the rapidly rising costs of healthcare in the 1980s, the current emphasis is on providing quality healthcare at the lowest possible cost. The increasing popularity of outpatient treatments and procedures is a direct response to the need to control the high cost of medical spending. In comparison to the costs associated with the traditional inpatient hospital, outpatient (ambulatory) clinics and hospitals are proving themselves to be a viable alternative. The nature of these new outpatient hospitals is quite different from the inpatient hospital.

The "bedless hospital" is emerging as a new medical facility type to fit the needs of the new environment. It can offer a variety of treatments and procedures to a wide segment of the population. Bedless hospitals are becoming more and more popular because they are being designed to be efficient, economical, and oriented to the needs of the consumer. In many ways, they may not even resemble a hospital.

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HOME CONTENTS ARCHIVES CALL FOR PAPERS

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The traditional hospital, with its focus on inpatient care, is undergoing a major transition. The clear trend now is outpatient treatment. As a result, the very nature of the traditional hospital is radically changing. Because of the transformations occurring within healthcare , there has been a drastic reduction in the number of licensed hospital beds nationwide. As reimbursement for inpatient beds has fallen, it is almost certain that this decline will continue. From 1992 to 1995, for instance, the number of licensed beds in the United States decreased from 923,000 to 700,000. By the year 2000, it is estimated that this number will fall to 500,000.1 Looking even farther, it is predicted that there will be fewer than 300,000 hospital beds by the year 2040.2 This portends a major change. Needless to say, hospitals are already looking to compensate for the declining revenue the loss of these beds represents.

Although we aren't likely to see the total demise of the inpatient hospital, the nature of the institution will certainly have to change to survive. For the foreseeable future, certain procedures --heart and brain surgery and organ transplants--will be performed in inpatient hospitals. Some demand for beds will be created by emergency room admissions. With the demographic shift toward a more elderly population, chronic care patients will place an increased demand on the system. But the number of traditional medical/surgical beds needed for patient care is decreasing as more and more procedures are being performed on an outpatient basis. By the year 2000, 80 percent of care provided in hospitals will be for outpatients. Only the critically ill will require inpatient medical procedures.

Two probable scenarios have been posed for the future of the inpatient hospital--either there will be "mega-hospitals," large, urban facilities designed specifically to treat a wide range of diseases, or there will be smaller specialty hospitals with fewer beds, dedicated to the treatment of specific diseases. As is often the case in healthcare today, the answer will probably lie in the reimbursement system. The type of facility which can provide the most economical medical treatment is most likely to be the hospital of the future.

Abstract Next

In response to changes occurring in the healthcare system, we are witnessing the development of a major new medical facility type - the bedless hospital - which is already a reality. It is likely to proliferate in the future as cost concerns become even more intense. This development is part of the ongoing evolution of the hospital and is a natural consequence of the social and economic factors at work in the medical marketplace. Primarily, it is a reaction to the high cost of medical care provided by the traditional acute care patient hospital. These new facilities that are developing also represent a fundamentally different way of looking at healthcare. Instead of thinking of our medical care system as essentially a sickness system, we now think of it in terms of wellness and prevention. This has profound implications for the way we view the system in general, and for the facilities in which healthcare is delivered. Patients, perhaps better called consumers, are finding that these new facilities are providing the best possible use of resources in a convenient and practical manner, with no sacrifice in quality.

Essentially, the bedless hospital offers the same range of services that the inpatient hospital offers. A bedless hospital may also be known as an ambulatory medical center or an outpatient medical center. It may be part of a network and fit into a continuum of services, ranging from primary care practices to secondary care centers (which would include the bedless hospital) to tertiary care centers in which the most intense level of care is delivered. The primary difference between the two types of facilities is that overnight stays are strictly limited. Bedless hospitals generally offer a full range of medical services including diagnostic imaging, ambulatory surgery, catheterization lab, primary and secondary physicians office care, wellness centers and health education libraries, urgent care, birthing, laboratory, and other essential support services (including information and communication systems.)

Strictly speaking, the definition of a bedless hospital may vary from state to state, due to different interpretations of what constitutes a "bed." It may be tempting to think in terms of the most literal definition of the bedless hospital, but this can be misleading. In the majority of cases, a stay is limited to less than 24 hours. There are states, however, that license so-called "short-stay" beds for up to 72 hours and such facilities may also be called bedless hospitals. In any case, these hospitals are only offering care for a limited time and any patient who could be considered critically ill would have to be referred to a tertiary facility for treatment.

With managed care and other cost control measures how the driving forces in healthcare, enormous changes are already occurring. This includes not only the way the system is being run, but also the nature of the buildings in which healthcare is

being delivered. New attitudes are creating a healthcare environment that is more efficient and better organized. Before the advent of Diagnosis- Related Groups (DRGs) in 1983, there was little attempt to rein in medical costs. The previous system was enormously inefficient because insurance companies were not likely to question procedures or tests that physicians ordered. All hospital stays were reimbursed on a per diem basis. Under this system, the physician wielded enormous power and in part created the demand for the inpatient hospital. The result was a wasteful system that left the patient with little control and resulted in extremely high medical costs that threatened our very ability to provide healthcare at reasonable costs.

This has changed, however, and there have been a number of paradigm shifts that are having an impact on the way medical care is being provided. Probably the most important of these is the transition from a provider-centered system to a consumer-centered one. The healthcare consumer has become very concerned about value. Since most reimbursement systems require a co-payment or set percentage caps on what they will pay, consumers are seeking facilities and physicians that provide the best value for their money. The smart consumer no longer passively allows the physician to make all the decisions. In becoming a consumer-centered system, we have moved from a system primarily of remediation (or reaction to an illness) to a system of anticipation and prevention. Our medical system is becoming more concerned with prevention of disease and the promotion of wellness. Proper nutrition, exercise, reduced consumption of alcohol, regular check-ups, pre-natal care, and reduced smoking are becoming a regular part of many peoples lives.

Previous Next

Trends responsible for the development of the bedless hospital:

• The formation of health systems and networks to take advantage of economies of scale and to eliminate duplication of services are now common. Mergers and acquisitions are taking place at an unprecedented rate, which is having the effect of reducing the total number of hospital beds in some areas. Former rivals are joining together to make themselves stronger market forces by reducing overhead and being able to offer the consumer a greater variety of locations and services. In order to capture a greater market share, these new partners may develop satellite diagnostic and treatment centers specifically devoted to the outpatient market. They are usually built in strategic market areas for greater consumer accessibility.

• Managed care is another major factor that is responsible for the growth of outpatient medical care. As managed care increases its penetration throughout the country, many new markets will be facing unprecedented pressures to offer the lowest possible prices for medical services. Before managed care, the inpatient hospital faced no real competition and insurance companies were likely to pay whatever fees were demanded. Hospitals wanted to keep beds full, since beds were revenue producers. Today, however, just the opposite is true. Capitation has completely changed the system. Under capitation, payments are fixed at a certain rate (or cap) per patient, per month. With only a fixed amount of money available, it is in the hospital's best interest to keep as many patients out of the higher cost setting as possible. The environment of care is much different for inpatient care than for outpatient care. When extensive nursing is required, which is typical of an acute care hospital, the cost of labor may be a major expense. By eliminating this expense, substantial cost savings may be realized. Since costs are frequently reduced with little or no sacrifice in quality in an ambulatory setting, payors are demanding that outpatient procedures be performed whenever possible.

• Changes in medicine, particularly in surgery and diagnostics, are drastically reducing recovery times, and time spent in the hospital. The success of ambulatory surgical centers and diagnostic imaging centers has shown it is possible to perform many procedures, outside of the hospital with good results and at lower costs. Minimally invasive procedures like laparoscopy and endoscopy, have greatly reduced the amount of time needed to recover from an operation or minor invasive procedure. In the future, image-guided therapy and trackless surgery will radically change surgery. Developments in telemedicine mean that it is no longer necessary to have expensive medical equipment at every hospital. It may be possible to take advantage of equipment at another facility from a remote location. Looking even further ahead, unraveling the mystery of the human genome could

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radically alter the way medicine is practiced.

Previous Next

Architectural considerations and building codes can make a substantial contribution to reducing the construction costs of bedless hospitals. However, it should be remembered that such codes may vary by locality, so what is allowable in one jurisdiction may not necessarily be allowable elsewhere. Generally speaking, because bedless hospitals are not providing care for inpatients, they may be subject to different building and life safety codes. Buildings in which inpatient care is being provided are generally classified as institutional occupancies and such buildings are subject to stricter guidelines for construction than other types of occupancies. Because the mobility of the patient population is significantly impaired, precautions must be taken to make the environment as safe as possible in the case of fire or other emergency.

As an example, according to NFPA101, a typical exit corridor in a hospital with bed-bound patients must be 8 feet wide, compared to 3 feet 4 inches for an ambulatory health center classified as a business occupancy. This alone can create much more square footage, and hence a larger building. Stricter life safety codes for inpatient hospitals generally require higher rated floor, wall, and ceiling assemblies, which can contribute to higher costs. Typically, an inpatient hospital is subject to type I or II construction, in which all structural components must be non-combustible. This dictates the use of a fire-proofed steel building frame and a composite steel and concrete deck or concrete frame with concrete floor slabs. An automatic sprinkler system is also required in such facilities, which may not be the case in certain business occupancies. More complex mechanical, electrical, and plumbing systems are frequently required, further increasing costs. Medical gas systems, nurse call systems, other communication systems, and other such items must also be considered.

The physical size of a traditional hospital is almost always larger, which naturally is more expensive to construct. A multi-story facility, for example, would require more vertical circulation elements. Reducing the number of exit stairs and elevators alone could amount to a significant cost savings.

Providing a similar range of services in a smaller building can result in greater economy, partly due to its smaller size, but also because eliminating nursing care for inpatients greatly reduces expensive labor costs, which are a major cost in a hospital stay.

Although the safety of patients in ambulatory facilities is important, they generally do not require the same level of assistance that less mobile patients require. The nature of the procedures being performed in these environments is not as complex. For buildings classified solely as a business occupancy, the building codes and life safety requirements are usually less

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stringent. In some circumstances, it may even be possible to use wood framing for such buildings. Another factor that contributes to economy is that simpler mechanical, electrical, and plumbing systems may often be used in ambulatory medical centers when practical.

The bedless hospital is not as simple to classify as it might appear. In some instances, these facilities may be classified as both business and institutional occupancies. When this is true, it means that the architect may often have to deal with more than one code. It is important to keep in mind that codes governing such facilities are not uniform throughout the country. A facility may require different mechanical, electrical, and plumbing systems for the institutional occupancy than for the business occupancy. This may be the case when, for example, a building contains both medical offices and an ambulatory surgery center. It may be necessary to provide an occupational separation between the surgery center and the rest of the building. Depending on the type of surgery being performed, there might be other restrictions placed on that part of the building like wider corridors. Because it is possible that patients recovering from surgery might not be able to exit the building under their own power, more stringent life safety considerations may come into play.

Previous Next

A primary reason for the economy of the bedless hospital is that fewer support services and space are required than in an acute care hospital. Spaces and services that require duplication in an inpatient hospital may often be more easily consolidated in a bedless hospital. Surgical services, for example, are not as comprehensive and provide a good example of the differences between the two types of facilities. Whereas a general operating room in an inpatient hospital requires a minimum of 400 square feet, exclusive of cabinets and drawers, according to *Guidelines for Design and Construction of Hospitals and Health Care Facilities*, an operating room in an outpatient setting requires 360 square feet. A minimum of four x-ray film illuminators per room are required in a hospital OR rather than the one required in outpatient facilities. Specialized ORs--for heart surgery, complex orthopedic procedures, or neurological surgery--require additional support spaces, special plumbing, and electrical connections. These would not typically be encountered in an ambulatory surgery center.

Space needed for the post-anesthesia recovery unit (PACU) in a general hospital is larger per code requirements. Although many of the same support spaces are required for both inpatient and outpatient surgery, the requirements are less specific for ambulatory surgery and they don't dictate the inclusion of the same number of plumbing fixtures, casework, etc. This is also true for other departments, particularly imaging and urgent care.

The compact nature of such facilities means that many items that are normally duplicated may be reduced. Rather than designing an excessive number of canopies, for example, it may be possible to consolidate these in a way that is convenient for patients and visitors, and that still enhances efficiency. Locating centralized registration and admissions near the main waiting area reduces the need to duplicate these areas. Other ancillary spaces like laboratory, recovery, pharmacy, housekeeping, staff lounges, and soiled and clean utility rooms should be positioned to reduce duplication. Locating departments that may have similar needs for equipment (an urgent care center and imaging, for example) in close proximity allows resources to be shared. This can greatly increase efficiency and lower costs.

When primary care doctors offices are located in the same building, the result is additional convenience for patients results since they will not have to travel long distances to receive diagnostic or treatment procedures. Overhead costs may also be less, since many resources are being shared among an entire facility. The following case study of a bedless hospital should help to show the essential characteristics of this new type of facility.

Previous Next

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Samaritan North Health Center

The Samaritan North Health Center, located in the Dayton, Ohio suburb of Englewood, is a satellite facility of the Good Samaritan Hospital. In keeping with its initial premise to provide an outstanding outpatient care center, it is truly a hospital without beds. The 220,000 square foot facility occupies a 44-acre wooded site in a residential area at the heart of the hospital's market area. Completed in 1995, Samaritan North is an outstanding example of how a bold vision of healthcare delivery can be accomplished. This occurs through a combination of visionary management, architectural innovation, and careful attention to providing a non-institutional environment. Initially, there was much resistance among the local physicians when planning for the facility began. Many of them already had interests in their own ambulatory clinics which specialized in surgery, diagnostic imaging, and rehabilitation. It seemed unnecessary for the new medical center to try to compete with these already established freestanding clinics. Yet the success of Samaritan North has more than silenced its initial critics, and construction of Phase II is already underway.

Figure 1: Samaritan North Health Center Main Entrance

It is important to note that from the very beginning, this project was conceived as a multi-phase project. A comprehensive master plan was created to insure that subsequent additions and renovations could be undertaken with a minimum of inconvenience and maximum flexibility. This was especially important in planning the ambulatory surgery center, which was classified as an ambulatory health care occupancy, rather than a business occupancy like the rest of the building. Type I and II construction were chosen so that the building could be adapted to a variety of uses in the future if necessary. Since it is located in a suburban neighborhood, it was important to design a facility that respected the local architectural vocabulary.

Designers chose a warm, handmade brick exterior, arched window openings, a sloped standing seam metal roof, and large expanses of glass to allow for maximum light penetration. The building massing helps to break up the large scale of the building so that it is more appropriate for its surroundings. The overall effect is decidedly non-institutional, which is carried through to the interior as well. Although the finishes and furnishings are attractive throughout the facility, more attention was paid to higher impact public areas. Much of the interior design scheme was inspired by the Prairie School and Arts and Crafts Era.

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Samaritan North is located on a sloping site, which suggested a multi-level building with different entrances. On the first floor, entering patients encounter a large mall, from which most services are clearly visible. This organization greatly minimizes wayfinding difficulties, which can be a source of patient stress. The entire area is flooded with natural light from a three-story skylight, greatly enhancing the interior environment. A central receptionist is clearly visible to assist patients. There is ample group seating throughout the first floor, which is broken up into smaller dedicated waiting areas. Located on this floor are a comprehensive, state-of-the-art diagnostic imaging center, a laboratory and pre-admission testing area, neurology, and cardiopulmonary medicine. 50 physicians offices are located on the two floors above the diagnostic imaging center. These are linked to critical diagnostic and treatment areas below by computer and pneumatic tubes so that patients can easily access services.

Figure 2: The atrium of Samaritan North Health Center

A good example of efficiency and patient-centered design is illustrated by the lay-out of the diagnostic imaging department, a major component of the Samaritan North Health Center. Staff work areas and office space are positioned so that they are surrounded by the various procedure rooms. This segregates patient traffic from staff traffic, and helps to promote a sense of privacy for the patients. When possible, services are shared to increase efficiency and eliminate duplication.

Phase II is already underway to increase Samaritan North's market appeal. A new ambulatory surgery department is being added directly adjacent to the diagnostic imaging center. It will include four operating rooms, two endoscopy suites, and a laser procedure room. Locating the surgery center in close proximity to the imaging department promotes efficiency and convenience for staff and patients alike. Two additional floors are being added above the surgery center to house additional physician offices.

As a further convenience for patients and families, the first floor houses a pharmacy that doubles as a gift shop, a childcare area, a community conference center, and a cafe-deli that emphasizes healthy eating. The ambiance in these areas more closely resembles a retail or hospitality environment than a healthcare environment.

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Figure 3: The cafeteria at Samaritan North Health Center.

Samaritan North also makes use of mobile medical technology to provide a greater range of services to its customers. The docking port is currently being used for a mobile lithotripter, but can be used for other mobile technologies when needed. To hide these unsightly vehicles from sight, a screen wall is being added to maintain the overall image and appearance of the building.

Previous Next

On the ground floor, the cancer care center and a rehabilitation and sports medicine center are located. A new parking garage is being added to serve the entrance at this level. As on the first floor, a receptionist is provided to assist patients. The oncology center is designed for maximum patient privacy. Light from the central skylight penetrates etched glass windows and enters the treatment cubicles of the cancer care center, affording the patients privacy while allowing them access to natural daylight. Additional office space is being added to the cancer center.

The rehabilitation center, which contains cardiac rehabilitation, occupational medicine, physical medicine, and the sports medicine department are furnished with the most up to date equipment. Eventually part of this department may be turned into a private health club, thus allowing Samaritan North Health Center to further extend its mission of wellness and prevention into the community. The Well Being Center, which contains the Health Education Library, offices, and two classrooms, is also an essential part of the facility. It allows the public to become better informed about health and prevention.

Figure 4: The Cancer Care Center.

An essential part of Samaritan North's success is the change in culture that was incorporated into the new facility. Departmental barriers do not exist here. Instead, a team concept has been introduced which combines former hospital departments like medical records, business office, nursing, lab, and imaging. This allows the team to work as a unit and report to one manager, who in return reports to the administrator. Patient care is greatly improved by this simplified organization, and also by cross-training of many employees. The elimination of barriers and reduction of hierarchy has made the facility more efficient and hence more economical. Fewer staff are required to run the facility under this type of arrangement.

As long as the current emphasis on providing the best possible healthcare at the lowest possible cost continues to be the driving force in the healthcare arena, it is likely that the bedless hospital will be a very important medical facility type. There will be some segments of the population that it cannot serve, but for many people, it will be the primary source for convenient, quality healthcare.

Figure 5: Main tower of Samaritan North

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Health Center

Previous Contents

Figure 1
(15k)

Figure 2
(23k)

Figure 3
(22k)

Figure4
(23k)

Figure5
(14k)

The Bedless Hospital: A New Medical Facility Type

Abstract

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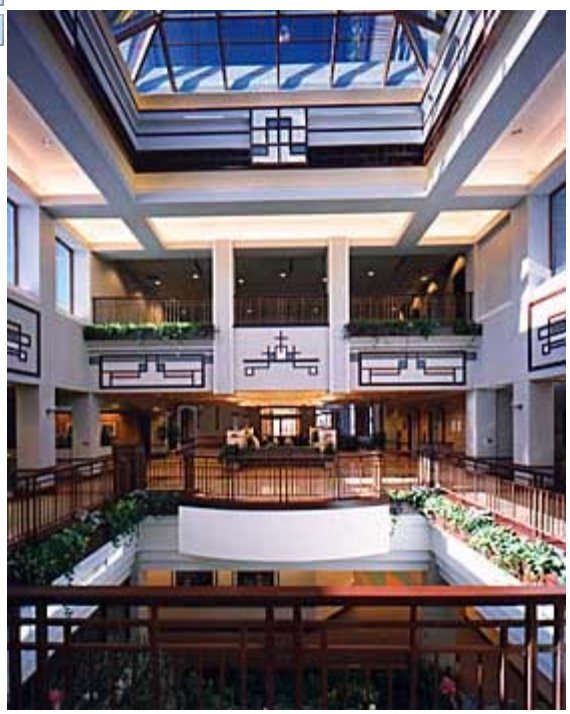

Figure 2: The atrium at Samaritan North Health Center is important as an organizational element of the building. Main registration is in the background. Architect: Earl Swensson Associates. Photo: Norman McGrath.

The Bedless Hospital: A New Medical Facility Type

Back to Photos/Plan

Back to Article

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A Professional Interest Area of The American Institute of Architects

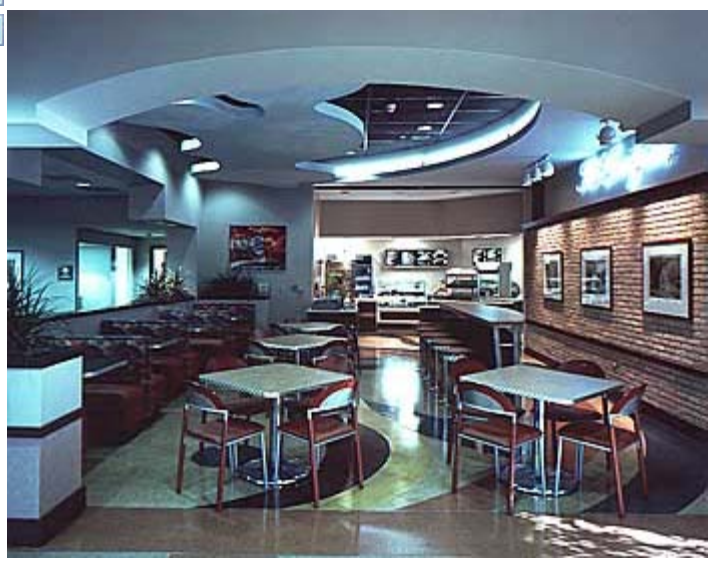

Figure 3: The cafeteria at Samaritan North Health Center is an added convenience for patients and staff. In appearance it resembles a hospitality environment. Architect: Earl Swensson Associates. Photo: Norman McGrath.

The Bedless Hospital: A New Medical Facility Type

Back to Photos/Plan

Back to Article

Published by The Academy of Architecture for Health

A Professional Interest Area of The American Institute of Architects

Figure 4: Cancer Care Center. Private patient treatment cubicles feature etched glass for additional privacy. Architect: Earl Swensson Associates. Photo: Norman McGrath.

The Bedless Hospital: A New Medical Facility Type

Back to Photos/Plan

Back to Article

Published by The Academy of Architecture for Health

A Professional Interest Area of The American Institute of Architects

Figure 5: Main tower detail of the Samaritan North Health Center. Architect: Earl Swensson Associates. Photo: Norman McGrath.

The Bedless Hospital: A New Medical Facility Type

Back to Photos/Plan

Back to Article

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