Environmental Design, Access Control, and Surveillance as Deterrents to Thefts in Hospitals

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This paper explores the general hypothesis that building designs that foster access control procedures and natural employee surveillance are important determinants of a lower theft rate,

A yearlong study of incident reports pertaining to thefts was conducted at a major urban hospital. Comparisons were made of different areas of the hospital. The results showed that those areas that were designated as (1) cul-de-sac, (2) access controlled, (3) under surveillance by other employees, or a combination of all three factors, had a lower theft rate than other comparable areas of the hospital. The study also showed that the addition of a fixed post with a hospital police officer had a negligible effect on the theft rate unless supported by other factors such as cul-de-sac, environmental design, employee surveillance, and access control.

Keywords: Hospital security; environmental design; access control.

Introduction

The Problem

Hospitals can represent microcosms of society with respect to the problems of theft. Hospitals, like society at large, are open, with each large hospital receiving several thousand visitors, patients, and employees each day. Hospitals are self-contained minicities that combine many businesses under one roof such as laundry, restaurant, hotel, office building, and construction services (Jaspan and Walter, 1978). Hospitals also contain many items that people would normally buy such as drugs, typewriters, calculators, televisions, tools, food, linens, and kitchen utensils. It is estimated that approximately 3,000 items in a hospital can be used at home (Palmer, 1971),

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Many of these items are items that can be carried by hand out of the hospital (Hamilton, 1978), are not traceable as hospital property, and, in many cases, are not even noticed as missing. Unfortunately, small items become large drains on a hospital's resources when taken in large quantities. For example, two hospitals reported the following losses over a 19-month period: 169,000 diapers, 26,000 sheets, 18,000 bedpans, and 8,400 blankets (Morse and Morse, 1974).

Unlike most businesses where the typical theft suspect is an employee, hospitals have an added burden in that the typical theft suspect may also be a patient, visitor, contractor, or contract service personnel, as well as an employee.

Finally, hospitals in inner city indigent urban areas often serve as a magnet for potential and actual criminals (Gardiner, 1978).

> Study after study in city after city in all regions of the country have traced the variations in the rates for these crimes. The results, with monotonous regularity, show that the offenses the victims, and the offenders are found most frequently in the poorest and most deteriorated and socially disorganized areas of cities (President's Commission of Law Enforcement and Administration of Justice, 1967).

Hospitals are vulnerable in this type of environment because of the abundance of usable goods that a modern hospital possesses and the limitations imposed on hospitals in trying to control the movements of the varied groups of people (Morse and Morse, 1982) who use the services, provide the services, or simply visit a hospital. Controlling movement of people in a hospital is difficult because of the complex entity of interrelated departments (Wiatrowski, 1982) that a hospital needs to provide and support adequate patient care. Unfortunately, these departments often work against each other. The standard methods of visitor control (e.g., identification card and visitor pass inspection) are only partially effective in an environment where, for example, a visitor can steal a television from a patient on the ninth floor and sell it to a patient on the sixth floor without ever leaving the building (Brill, 1979).

A Solution to the Problem

One goal of this research is to explain the observed differences in theft rates in terms of building-design features and employee security practices. This project will explore explanations that go beyond generally accepted causation theories of crime, such as:

1. The abundance of goods.
2. The physical security of goods.
3. The level of surveillance.
4. The occasion . . . for crime (Brantingham and Brantingham, 1984).

This study will not explore all the relevant sociological and psychological theories on crime causation. However, theories that relate to theft as a crime of opportunity will be cited; other studies that show how changes in environmental design can change the rates of theft will also be cited.

This study takes the position that since society has been unsuccessful in treating the cause of crime, efforts should focus on preventing the crime itself (Kuhlhorn and Svensson, 1982).

> If the police were to wait until all criminogenic causes had been duly identified and quantified and their relationships one with another duly evaluated they would have to wait until doomsday for, after all, causal research has been going on since the time of Lombroso at the very least. Causal research is needed, but the failure to act does more harm than putting a foot wrong in the choice of method . . . (Schafer, 1982).

This study will offer a comprehensive view of theft in a hospital setting. Also, if the objectives of the study are achieved, it will be the First to link environmental design to the incidence of theft in a hospital. This study may also serve as a model for other hospitals to assess the degree of theft on their premises and to evaluate some strategies that may be used to reduce thefts.

Review of the Literature

After a thorough study of the literature on hospital theft, this researcher found some opinions about but no research on environmental design, access control, and natural surveillance as possible precipitating factors in theft. However, there was considerable literature related to other environments. Therefore, the main focus of this literature review will be to consider the literature and research on crime prevention through environmental design, access control, and natural surveillance.

Environment and Crime

During the 1960s, several theories were developed that stressed architectural design as a crime deterrent.

Lee Rainwater (1966), in evaluating a public housing project, spoke about the effects of physical design on the attitudes of public housing residents. He pointed out that architectural design could be related to antisocial behavior. Elizabeth Wood (1961) theorized that public areas in apartment buildings should be designed to facilitate natural surveillance by the building's residents. Wood also stressed that social control by the residents was also an important factor. Jane Jacobs (1961) wrote that safe areas had extensive pedestrian traffic with numerous "eyes on the street" (natural surveillance by neighborhood residents). Jacobs stressed the value of social control:

> No amount of police can enforce civilization where the normal casual enforcement of it has broken down (Jacobs, 1961).

Jacobs also noted how areas surrounding big institutions, such as urban hospitals, became areas of stagnation and decay, because these were areas with little or no social control of crime.

Shlomo Angel (1968) noted that opportunities for crime are created independent of the criminal. For example, a patient who leaves a radio in his/her room creates an opportunity for a criminal that would not have otherwise existed. After considerable research, Angel hypothesized that safe areas experienced either little or much pedestrian traffic and that unsafe areas produced enough pedestrians to have an adequate supply of victims but not enough to provide adequate surveillance. Angel noted how people's patterns of walking were affected by urban design:

> People walk along sidewalks or streets but seldom traverse blocks. People follow designated paths in parks and gardens: they tend to wait for the bus at the bus station and not along its route, and they enter their homes through the front or back door (Angel, 1968).

Defensible Space

The preceding could be considered a prelude to works of Oscar Newman who incorporated the works of Woods, Rainwater, Jacobs, and others into a concept that he called "Defensible Space."

The term defensible space developed from a study that Newman and others did on the Pruitt-Igoe Public Housing development. This residential project developed out of policy decisions based on misinterpretations of the works of Shaw and McKay and others. The premise was simple: If you build new housing in the area where concentrations of criminals live, then you will be able to reduce crime and people will take better care of their neighborhoods. Unfortunately, this theory did not work, and Pruitt-Igoe was subsequently demolished because it had become unlivable, with high vacancy and crime rates.

Interestingly enough, the research group did find isolated pockets of the development where the crime rates were low and the residents felt that they had territorial control of the area:

> It became clear that the terms they were using to distinguish those areas they felt they had rights to were in fact evocative of besieged encampments—hence the term defensible space (Newman, 1973a).

In studying the design of these areas, Newman and his group found some design features that were common in the areas studied. From this and other studies, Newman came to the conclusion that public housing projects can be designed to allow residents the opportunity to assume some responsibility for protecting their environment. In addition, this environment would diminish criminal opportunities.

Newman developed four major hypotheses central to his theory of defensible space:

1. The subdivision of projects and building can encourage tenants to assume territorial attitudes and prerogatives.
2. Design augments the capacity of residents to consciously survey their living environment.
3. Through geographical juxtaposition with safe areas, the security of adjacent areas is improved.
4. Design influences the perception of a project's image, stigma, isolation, and vulnerability

Newman Tests His Hypotheses

After Newman developed his four major hypotheses, he did a comparative study of two housing developments with similar size, population density per acre, and social and economic conditions (Newman, 1973b). He studied two New York City housing projects that were situated adjacent to each other: the Brownsville and Van Dyke Housing Projects. In addition, both projects are controlled by the New York City Housing Police. However, both these projects were designed differently.

Brownsville consisted entirely of low-rise buildings (three to six stories) with walk-ups and elevators. Van Dyke was composed of a mix of three- and 14-story buildings with 90% of the apartments located in the high-rise buildings.

In addition, most entries to Van Dyke buildings were made by 112 to 136 families. No Van Dyke building could be entered directly from the street. Interior paths that afforded poor visibility were used to reach each building entrance. Brownsville's apartments, on the other hand, could be entered directly from the street. Each building housed one to 13 families.

The results of this study showed that the Van Dyke projects had 66% more total crime incidents, 2.5 times as many robberies, and 60% more felonies, misdemeanors, and offenses than the Brownsville houses. Van Dyke also had a higher rate of tenant turnover despite the fact that Brownsville was an older project with smaller apartment sizes.

Newman concluded that architectural design will either increase or decrease crime because of two factors:

1. Social: by creating spatial arrangements that either encourage or discourage a feeling of communal responsibility among tenants for the defense of certain areas.
2. Physical: by making spaces more or less accessible and by facilitating or inhibiting pursuit (Newman, 1973a).

Newman noted that to a criminal a fire escape will facilitate entry to an apartment, and a building with multiple exits will facilitate escape from a building.

Other Research on Environmental Design

A study of public housing in New York City (Newman et al., 1978) examined whether building size has an effect on the control of space and whether control of space was a precipitating factor in causing crime or fear of crime. One conclusion applicable to this thesis was found. The greater the residents' control of visitors to an apartment building, the less the amount of crime and fear of crime.

Richard Gardiner (1978) concluded from his own research and that of Newman and others that

> The design of the physical environment has the capacity to either deter or facilitate crime by enhancing the resident's ability to monitor and control his own environment.

Gardiner wrote that other factors could destroy the social cohesiveness of a neighborhood such as a buildup of regional-type services (e.g., hospitals, schools, shopping centers). Gardiner theorized that this buildup would create conflicts for residents because of the increased numbers of nonresidents. Potential offenders would move through the neighborhood unchallenged as residents would experience difficulty distinguishing between neighbor and nonresident:

> A high degree of recognition among neighbors has been shown to produce comparatively low crime rates (Newman, 1973a).

Territorially, a major concept in Gardiner's and also Newman's theories occurs when a resident takes responsibility and interest in his/her area. The resident becomes aware when his/her territory is threatened and acts to defend his/her turf. Thus, a potential offender becomes aware that he/she is intruding on others' territory and risks being noticed if he/she intrudes (Gardiner, 1978).

Crime Prevention Through Environmental Design

Hartford, Connecticut (Fowler and Magione, 1979) conducted a study to determine if design changes in a neighborhood would reduce crime and the fear of crime in the area studied. The design changes included changing through streets into cul-de-sacs and narrowing entrances to streets with cul-de-sacs, and police-initiated changes included the permanent assignment of officers to particular geographic areas of the neighborhood.

Two findings applicable to this thesis were found in the Hartford study. First, physical design changes such as creating cui-de-sacs and narrowing entrances to blocks reduced crime and fear of crime. Second, the permanent assignment of police officers to particular geographic areas of neighborhood reduced crime only in those neighborhoods where physical design changes also were made.

Critique

The theories of defensible space and environmental design were not without criticism. Jeffery (1977) noted that "there is no reference to the academic side of criminology in the work of Newman and his followers" and the Crime Prevention Through Environmental Design projects lacked a "theoretical or behavioral science foundation." Even Newman's concept of territoriality was attacked, and one researcher (Suttles, 1972) concluded that "latent territoriality,"

which was based on studies of animals, did not take into account the many social factors that could help or inhibit territoriality. Other researchers have also found that informal social control is needed to make defensible space effective (Taylor et al., 1980; Merry, 1981).

In studies where residents or employees were able to exert social control, the success (i.e., decreased crime and fear of crime) of these design changes was clearly evident. For example, an evaluation of the 18 safest neighborhoods in New York City revealed that although physical factors (isolated, controlled access, natural boundaries) were important, it was the nonphysical factors (private-security, doormen, resident patrols, informal social controls) that made the physical factors important (Young, 1981).

As noted by Jane Jacobs (Jacobs, 1961) and in studies of buildings where employees engaged in natural surveillance (e.g., doormen), the rate of crime was always much lower (Reppetto, 1974; Waller, 1976).

Employee and Environmental Design

In a study by Hope (1985), the principles of situational crime prevention were tested in relation to burglary in school buildings. The study tested the hypothesis that the design of a given school played a factor in the rate for burglary. Schools were classified according to basic design characteristics, and then comparisons were made to see whether the different rates of burglaries were based solely on different building designs that affected opportunities for access, amount of surveillance, and reward or to social and educational influences. Fifty-nine schools were studied in the London metropolitan area; each school was considered a separate unit of analysis. The length of time for the study was 1 year.

This study found that in schools where the design of the buildings made it easier for the school's caretakers (combination of night watchmen and maintenance man) to control access and engage in natural surveillance, there was a lower burglary and vandalism rate.

Conclusion

It is anticipated that the positive results of these studies in the literature review can be duplicated in a hospital setting. The crime prevention concepts apply equally as well to a hospital environment.

Method

The basic research question of this paper may be expressed as follows: Can general crime control strategies related to cul-de-sacs, access control, and nonpolice surveillance be used as theft prevention strategies in hospitals?

1. It is hypothesized that the number of thefts is less in areas that are
   - designed as cul-de-sacs,
   - access controlled,
   - fixed posts of hospital police officers, and
   - under surveillance by other employees.
2. It is hypothesized that the number of thefts is greater in traffic-link areas.

Scope and Limitations

This study begins with a descriptive analysis of the number of thefts at a major urban hospital and medical center with over 500 beds. It is based on reported thefts that occurred at this hospital between June 1, 1985 and June 1, 1986.

Definition of Terms

1. *Theft.* Consists of the unauthorized actual or attempted removal of tangible items from the hospital. Theft will be further qualified as to the types of victim. Thefts will be categorized in such terms as corporate, employee, patient, visitor, and other. Theft of time, theft of patient information, or computer information will not be considered in this thesis.
2. *Cul-de-sac.* A part of the hospital that is at the end of a hallway and that offers no further exits to another hospital area.
3. *Full access control.* Full access control exists when admittance to an area and egress from an area are controlled by hospital personnel. Doors to the area are kept locked. Partial access control exists when doors to area are not locked, but visitors and personnel from other departments are often questioned as to reason(s) for being in the area. No access control exists when visitors and employees of other departments are seHom questioned as to reason(s) for being in the area. Doors to the area are not locked.
4. *Fixed post.* A limited area of the hospital that is patrolled by a security officer.

5. *Surveillance.* Surveillance exists in patient areas where the nursing station or other employee work areas enable hospital personnel to observe people entering, leaving, or walking in the area.
6. *Traffic-link area.* A traffic link area is a patient or department area that is used for pedestrian traffic to different areas of the hospital.

Research Design

The design of this study draws on Hope's (1985) study of burglary in schools. This study on hospital thefts differs in that a single hospital was studied instead of 59 different schools. Different areas of the hospital each constitute units of analysis. The study considers design factors as an influence on the number of thefts; it also considers access control and proximity of hospital officers.

The 1985 study of burglaries in schools was chosen as a model because it demonstrated an important principle: that situational factors in the environment increase the crime rate and that specific remedies must be developed to mitigate the effect of these factors.

In conducting the research, the following steps were taken: First, a quantitative description of the number of thefts in various areas of the hospital was compiled. Second, theft rates in different areas of the hospital in relation to design factors, proximity of an officer, amount of surveillance, and access control policy were analyzed.

Measures and Sources of Information

The primary data source consisted of the following data from 207 incident reports of theft that have been reported to the hospital police: location, time, item, suspect, victim, method of entry, and officer near area of theft.

During this period, officers and supervisors were given instruction in incident report writing by this researcher in order to insure standardization of data. All reports of thefts that were available during the period of this survey (July 1, 1985-June 30, 1986} were used in this study.

The secondary data source consisted of a review of the literature on patterns of theft. Because there is very little research oh patterns of theft by area in hospitals, most of the review will consist of theft patterns in other settings (e.g., buildings, residences, streets), showing how this compares to the data received from the hospital.

Techniques of Analysis

The statistical analysis consisted of SPSSX cross-tabulations and frequencies.

Critique

The major defect in this type of study is that it does not cover items stolen that are never reported missing. These include items that are disposable (diapers, linens, food); an employee might not even notice that they are missing.

The Burns Security Institute in 1972 published a national survey on hospital security. In the survey of 194 U.S. hospitals, 86 listed linen as their major theft item and 38 listed personal effects and cash as their highest major theft item (Burns Security Institute, 1972).

In general, with the exception of personal items, employees will report items missing only when they are required to in order to replace the missing item. This is a serious defect in doing a study about a building that has over 3,000 items (most of which are disposable) that a thief can use at home.

Another problem with using theft reports as a data base is that it is difficult to determine the strength of each variable. For example, if the pediatrics inpatient area that is a traffic-link area has a higher theft rate than a comparable area with controlled access (inpatient psychiatric areas), is this due to situational factors or merely the reflection of a higher crime rate among adolescents in regard to petty thefts? Another problem that is beyond the scope of this study is that in some patient areas, especially in intensive care units, patients are forced to spend more time in bed and thus would have a better chance to witness or deter a theft.

Another drawback to this study is that this research is based on only one hospital. It is hoped that this research will become a practical model for other hospitals.

Results

In general, the data on thefts in the hospital support the hypothesis that the theft rate was lower in areas that were designated as cul-de-sacs, full access controlled, partially access controlled, or under surveillance by employees. Thefts were higher in areas that were defined as traffic-link areas or no access control areas.

Table 1. Comparison of Theft Rates Between Cul-de-Sac and Traffic-link Areas

Area	Traffic-link Areas	Cul-de-Sac Areas
First floor	15	6
Second floor[3]	26	7
Third floor	14	5
Sixth floor	16	8
Seventh floor	6	4
Eighth floor	12	2
Ninth floor	5	4
Tenth floor	3	2
Emergency room I (clinic)	-	3
Emergency room 2 (trauma)	14	-
Emergency room 3 (psych)	-	1
Emergency room 4 (acute)	-	3
Main lobby	4	-
Total no. thefts	115	45

[a]Does not include rates for emergency rooms 1, 2, 3, and 4 and main lobby, which are listed separately.

A major finding of this study was the great difference in theft rates between traffic-link areas (115 thefts reported) and cul-de-sac areas (45 thefts).

Table 1 provides a comparison between various cul-de-sac and traffic link areas in the hospital. The greatest difference occurred on the second floor, which also boasts the highest theft rate of all areas measured: the theft rate in traffic-link areas was 44 thefts reported, and in cul-de-sac areas, 11 thefts reported; these thefts include those in emergency rooms 1, 2, 3, and 4 and the main lobby, which are all on the second floor but listed separately in Table 1.

In connection with the first finding, the study also indicated that a difference exists in the ratio between low-value (under $100) and high-value items taken when both areas were compared. Table 2 shows that the ratio (1:1.2) of incidents with low and high values in traffic-link areas is similar to the ratio of incidents with low and high values in all the areas of the hospital. However, the ratio (1:2.2) of incidents with high and low values in cul-de-sac areas is much higher. The number of high-value thefts in cul-de-sac areas are much lower.

Table 2. Comparison of Theft Rates Between Cul-de-Sac and Traffic-link Areas With Value of Item

	Cul-de-Sac		Traffic Link		Total All Areas	
	No.	%	No.	%	No.	%
Value under $100	31	69	63	54.8	117	56.5
Value over $100	14	31	51	44.3	89	43.0
Value unknown	0	0	1	.9	1	.5
Total incident reports	45	100	115	100.0	207	100.0

"Total all areas" also includes areas not designated as "traffic link" or "cul-de-sac," such as the fourth floor or the outside parking lot.

Although not as great a disparity as the comparison between traffic-link areas and cul-de-sac areas, the comparison of theft rates in patient areas with full access control, partial access control, and no access control (see Table 3) showed that the most thefts occurred in areas with no access control (31 thefts reported), followed by areas with partial access control (14 thefts reported).

The lowest number of thefts occurred in areas with access control (six thefts reported). Table 3 shows a consistent pattern, with one exception, in the individual areas measured. Higher theft rates occurred in no access control areas, with lower rates in partial

Table 3. Comparison of Theft Rates in Patient Areas With Different Amounts of Access Control

Area	Access Control	Partial Access Control	No Access Control
Emergency room 1 (acute)	–	3	–
Emergency room 2 (trauma)	–	–	14
Emergency room 3 (psych)	1	–	–
Emergency room 4 (acute)	–	3	–
Psych inpatient[11]	4	–	–
6-0 block (pediatrics I.C.U.[b])	–	2	–
6-100 block (pediatrics in patients)	–	–	7
7-0 block (labor and delivery)	–	4	–
7-100 block (infant in patient)	–	–	1
8-0 block (I.C.U.)	–	1	–
8-100 block (adult inpatient)	–	–	5
8-300 block (detox patients)	1	–	–
9-0 block (surgical I.C.U.)	–	1	–
9-100 block (adult inpatient)	–	–	4
Total no. thefts	6	14	31

"At the time of the survey, the fifth floor psych unit was composed of six separate sections and had the same amount of space of an inpatient floor.

[b]I,C.U. = intensive care unit.

Table 4. Thefts in Areas Designated as Fixed Posts With Areas Considered; In Relation to Traffic Flow and Surveillance

Fixed-post Areas	Access Control	Partial Access Control	No Access Control	Surveillance	Cul-de-Sac	Traffic Link	Theft Rate per Post
ER- 1 (clinic)		X			X		3
ER 2 (trauma)			X			X	14
ER 3 (psych)	X			X	X		1
ER 4 (acute)		X		X	X		3
6-0 block (pediatrics I.C.U.[h])		X		X	X		2
6-100 block (pediatrics)			X			X	7

ER = emergency room; I.C.U. = intensive care unit.

access control areas and the lowest rates in full access control areas.

The one exception was a traffic-link area (7-100 block) which had a lower theft rate than one of the cul-de-sacs (7-0 block): one theft compared to four.

Table 4 is a cross-tabulation of areas designated as Fixed-post officer patrolling areas with various other areas considered cul-de-sac, traffic links, full access control, partial access control, no access control, or surveillance areas. Here again, there is a consistent pattern. The greatest number (14) of thefts was reported in an area that is a traffic link with no access control; the smallest number (1) of thefts was reported in an area that is a cul-de-sac with surveillance and access control.

Another key finding of this study concerns the thief s method of entry to an area (see Table 5).

What Was Stolen

The top five items stolen are shown in Table 6. These five items represent 42.6% of all thefts reported.

Discussion

If one compares the literature review with the results of this study a pattern emerges. The "visitor thief is very similar to the average burglar. For example, in both cases, the thief avoids cul-de-sac areas where the thief might get trapped, partial or full access control areas where the thief s presence may be questioned, or surveillance areas where the thief may be seen. Even when a theft occurs in one of these areas, the value of the item taken is generally lower in these areas than in traffic-link and no access control areas.

As in other studies of theft, more thefts occurred in heavy activity areas where it is difficult to determine who are authorized users of these areas, for example, by visitor pass or clinic appointment slip.

The major center of activity for this hospital was the second floor, which also included the emergency rooms and main lobby. The second floor had the highest theft rate.

Newman, in his study of public housing projects, also noted the high theft rate in main floor areas (Newman et al., 1978).

Another interesting finding that replicates other research concerns the notion that criminals commit most of their crimes in areas where they feel most comfortable. These may be areas that they visit or use on a daily basis. Consider the tenth floor, for example. During the period of this study, the tenth floor was mostly deserted during evening and nighttime hours. It contained many pieces of office equipment, such as IBM typewriters and expensive computers. Access to the area was easy, as well as escape from the area,

Table 5. Method of Entry

	Type			
	Key	Break-in	Open Area	Unknown
No. thefts	23	10	162	13
Percent of thefts	11.1	4.8	77.9	6.3

Table 6. Items Stolen

Item	% of Thefts
1. Money	12.
2. Radios	10.7
3. Purses/wallets	7„3
4. Nonmedical equipment	6,.8
5. Telephones	^.8

with minimal chance of being seen. In addition, even though the rooms that contained the equipment were kept locked, the locking device consisted of a low security padlock and chain attached to the handle of a glass door. In addition, most of the various pieces of equipment were clearly visible from one of the outside hallway areas.

All economic rationale theories that weigh the chances of getting caught versus the economic gain would certainly list the tenth floor as a possible high-theft area, yet only 2.4% of all thefts were committed on this floor. Contrast this to the second floor areas where 27.9% of all thefts were committed and where 50.9% of the items taken had a value of $100 or less.

Only four reports of missing medical equipment were made. This is consistent with other studies on theft in hospitals. To steal medical equipment usually requires knowledge of specialized markets in order to gain monetary rewards from the theft. This reason, not environmental design, is probably the major factor in the low theft rate of medical equipment.

There was generally less theft in areas with partial access control as opposed to no access control. The one big exception was the 7-0 block; this area contained labor and delivery. More thefts (four) were reported here than in the 7-100 block, which contained infants and inpatients; only one theft occurred there. However, a closer look shows that these figures are not entirely inconsistent with the other theft rates given in Table 3. Even though the 7-0 block is mostly an area that is rated partial-access control and surveillance the majority of the thefts occurred in a small room outside of the labor and delivery area that is used by visitors, and conversely, although the 7-100 block is rated a traffic-link and no access control area, entrance to the infant patient areas, which make up 75% of the total 7-100 block area, are controlled by the nursing staff. During periods when a nurse is not present, this area is kept locked.

The data in Table 4 indicate that the presence of an officer on a fixed post does not directly affect the theft rate in that area. The table seems to indicate that the more negative factors (i.e., traffic-link area, no access control) in a given area will result in a higher theft rate. The study also indicates that the more positive factors (i.e., access control, partial access control, surveillance, and cul-de-sac) in an area will result in a lower theft rate. This part of the study only involved 30 cases; obviously, a longer period is needed to determine if these figures will hold true. As a correlation to this, the highest rate of theft occurred on the second floor. Approximately 60% of the fixed posts are located on this floor.

What these figures seem to indicate is that an officer on a fixed post has a marginal influence on the theft rate. This also correlates with research on burglary that indicated that the burglars were more concerned about the victim being home than they were concerned about the police.

It is beyond the scope of this study to offer a full explanation of why an officer on a fixed post has only a marginal influence on the theft rate, if, indeed, subsequent research does establish this as a fact. However, if one accepts the theory that thieves have at least limited rationality, then the following three points may offer a partial explanation.

First, all the officers assigned to fixed posts on the second floor had access control as their primary responsibility. This meant that most of the officers' time was spent on a small part of their post area. Second, it was indicated (Table 5) that 77.9% of all reported thefts occurred in an open area. Third, the top five items stolen (Table 6) were mostly of small, easy-to-carry and conceal items such as money, radios, pocketbooks, and wallets. The simple reality of the preceding three points is that an officer on a fixed post lacks the surveillance capabilities to deter theft in the majority of areas of his/her post.

This study does not intend to disparage the critical role that hospital police play in providing a safe and secure environment. In fact, during the period of this research, these officers accounted for 89 arrests, 68 criminal summonses, 483 parking summonses, and 4,483 calls for service. Obviously, the hospital police are assuming their responsibility of providing a safe and secure environment.

What is implied here is that the problem of theft in a hospital is too heavy a burden to place solely on the hospital police.

The data in this thesis also indicate the answer to this problem. The only persons who can control the theft rate in a particular area of a hospital are the employees who work in that area of the hospital and whose work area consists of positive environmental factors such as access control, natural surveillance, and cul-de-sacs.

Conclusion

The major conclusion to be drawn from this study is that appropriate environmental design is a factor in controlling theft from a hospital. Appropriate environmental design includes such features as cul-de-sacs, full or partial access control, and surveillance considerations. Some parts of the hospital in this study have achieved defensible space. This was accomplished with little help from traditional police activities.

Three implications can be drawn from this major conclusion: First, hospitals need to look at areas in terms of theft rates in order to determine the effects of design and work procedures on their theft rates; second, hospitals then need to employ a systematic approach that considers such varied factors as design changes, access control procedures, alarms, closed-circuit television, or, lastly, uniformed security officers; third, if enough hospitals quantify their theft rate by area of the hospital, an accurate research base can be created to predict the effects of design, technology, procedures, and uniformed officers on the theft rate of a hospital.

In the future it may be possible that before a new hospital is built, before a new wing is added, before a part of the hospital is renovated, and, lastly, before a partition is put up or torn down the director of security will be required to issue a "crime-impact statement." Research has shown that it is foolish to ignore the danger of fire in design considerations. It may also be said that future research will show that it will be equally foolish to ignore the impact of crime on design consideration.

Further research is needed to substantiate these findings and to uncover additional variables related to hospital security. Until scientific research is conducted in this area, hospital security as a field will have to create their own "research-practitioners" with skills in crime analysis and crime prevention through environmental design. Several hospital security departments have already developed crime prevention programs. The research-practitioner concept would just be an extension of the crime prevention program.

If hospitals are inadequately designed, it may require millions of dollars to correct the inadequate designs with environmental changes, alarms, closed-circuit television, and more security officers.

> The full impact of what is possible through architecture is not commonly known. Architectural design does not deal only with style, image and comfort; it can create and prevent opportunity for encounter within a space, in many instances, simply by not providing that space (Newman, 1973).

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