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Common Mistakes in Designing Pyschiatric Facilities

Abstract | Article

Suicide prevention and patient and staff safety issues in psychiatric units present a very unique set of issues. Three newly constructed psychiatric hospitals, one on each coast and one in the center of the country last year had significant patient safety issues. Other facilities spent substantial amounts of money remodeling existing units and not only didn't resolve patient and staff safety issues, but (in some cases) actually made them worse.

National statistics show that the average 24 bed psychiatric units will experience one successful inpatient suicide per year and patient-to staff injuries continue to be a major concern for most facilities.

Possibly the most important design feature of a psychiatric unit is maximizing visual observation of patients from the nurse station. If this is not addressed early in the schematic design phase, it will likely never be attainable. The level of concern for patient safety increases with the amount of time they spend alone in a space, such as patient rooms and toilets.

The need for patient safety tends to drive the aesthetics of the units toward prison-like environments. This is counter-productive to treatment and the healing process of the patients and should be avoided.

The solutions are often the opposite of what is typically done on medical/surgical units. Design professionals who do not address these issues carefully may be incurring major liability should a successful suicide or staff assault occur in an improperly designed unit that doesn't meet a reasonable standard of care.

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Psychiatric Facilities

Introduction

Suicide prevention and patient and staff safety issues in psychiatric units in hospitals (or entire psychiatric hospitals) present a very unique set of issues. Three newly constructed psychiatric hospitals, one on each coast and one in the center of the country last year had significant patient safety issues. Two of them were open less than one month before remedial action was taken and the third had its opening delayed by six months while changes were being made. Other facilities had recently spent substantial amounts of money remodeling existing units and not only didn't resolve patent and staff safety issues, but in some cases, actually made them worse.

The Problem

A recent study concluded that:
"Suicides on the inpatient unit are infrequent but tragic and generally unpredictable events. Although studies have identified risk factors for this occurrence, the ability to employ them to effectively predict which individuals will end their lives as inpatients has proven difficult[1]."

This study defined "infrequent" as being "...between 0.1% and 0.4% of all psychiatric admissions." [1] Using the 0.1% rate, every 24-bed inpatient psychiatric unit with an average length of stay of 7 days and 85% occupancy would average one successful suicide per year. It is difficult, if not impossible to reliably identify which patients will suicide[1]. Therefore, it is good practice for hospitals and design professionals to adopt a "Universal Precautions" approach to the risk of inpatient suicide, where the same level of care in designing the facility is taken for all patients.

The "Guidelines for the Design and Construction of Healthcare Facilities"[2] (hereafter referred to as the "Guidelines") that is jointly published by the AIA and FGI states:

"A safe environment is critical; however, no environment can be entirely safe and free of risk. The majority of persons who attempt suicide suffer from a treatable mental disorder or a substance abuse disorder, or both. Patients of

inpatient psychiatric treatment facilities are considered at high risk for suicide; the environment should avoid physical hazards while maintaining a therapeutic environment. The built environment, no matter how well it is designed and constructed, cannot be relied upon as an absolute preventive measure. Staff awareness of their environment, the latent risks of that environment, and the behavior risks and needs of the patients served in the environment are absolute necessities. Different organizations and different patient populations will require greater or lesser tolerance for risk.[2]"

Many psychiatric patients are very intelligent and creative. Those with suicidal ideations spend a great deal of time thinking about ways to commit suicide and they can devise some much unexpected methods. There is also a significant sub-culture that spreads new methods with astounding speed throughout the country. A recent example of this is a rash of hangings from cabinet doors, especially wardrobe doors. This started in one area and quickly became a problem nation-wide. Therefore, it is not a question of if a facility will have a patient successfully commit suicide, but when.

Programming
As with all projects, any successful design begins with a comprehensive Program. The typical information should be obtained from the client including the number of beds, number of offices, etc. In addition, it is highly recommended that careful attention be paid to the recommendation in the "Guidelines". This document has been formally adopted by many jurisdictions and is the widely accepted Standard of Care for the design of healthcare facilities. It is not uncommon to encounter resistance from clients who do not want to provide seclusion rooms that meet these standards or do not want to allow for as much activity space as required. However, compliance with the parameters outlined in this document may provide significantly lower level of legal exposure for the institution and the designer if the design should ever need to be defended in a court of law. Therefore, the size of the patient rooms, ratio of activity areas per patient, number and design of seclusion rooms, location and number of patient toilets and bathing facilities and many other features are prescribed in this document. If the client insists on varying from these standards, it is suggested that these deviations and the reasons for them be clearly documented.

General Design Layout
Possibly the most important design feature of a psychiatric hospital or unit is maximizing visual observation of patients from the nurse station as illustrated in Figure 1. If this is not addressed early in the schematic design phase, it will likely never be attainable. Even the most comprehensive remodeling project will have difficulty correcting mistakes of this nature.

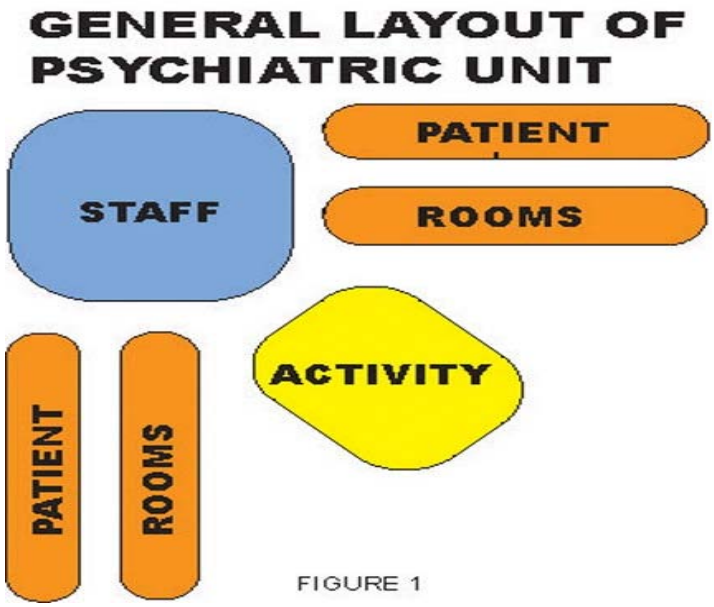

FIGURE 1

The number of patients per room is another major issue. The current (2006) edition of the "Guidelines" calls for a maximum of two patients per room (except that four patients are allowed in children's units). There has been a great deal of discussion about the possible advantages of single patient rooms. This is not in any standards at this time and there is no conclusive evidence at this time that single rooms provide either clinical or safety advantages. This issue should be carefully weighed with the client.

The "Guidelines" currently call for one patient toilet room per patient room and that it is directly accessible to the patient room without the need to enter the corridor for access. Some facilities are not comfortable with this requirement and prefer the staff be able to observe when patients enter the toilet rooms. The 2010 Edition of the "Guidelines" will permit such an arrangement.

It is also recommended by the "Guidelines" that Patient Room to Corridor doors swing out into the Corridor to reduce the ability of patients to barricade themselves in their rooms. However, doing this often creates recesses or alcoves in the corridor that create observation difficulties. However, an outward swinging door may create fire code issues by restricting the corridor width. Corridor doors also are often required to be fire rated and/or be equipped with smoke seals, depending on the codes involved in a particular jurisdiction. There are several solutions to these issues, but a discussion of these options is beyond the scope of this article.

Some patients tend to gather around the nurse station and want to stay there, so it is a good idea to have some space near the nurse station for quiet activities such as table games or comfortable seating for reading. Otherwise makeshift adjustments will be improvised that usually result in obstructing corridors or inhibiting staff movement.

Varying Levels of Precautions

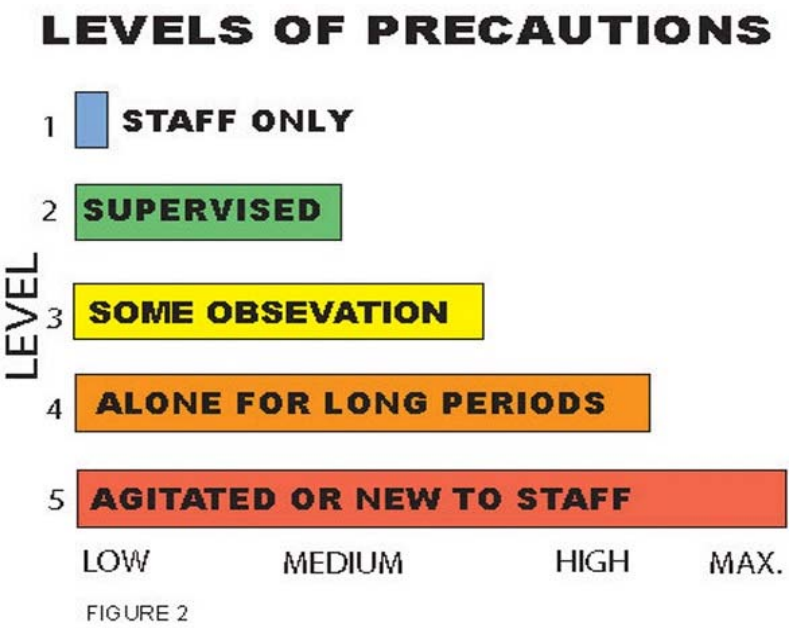

FIGURE 2

The "Guidelines" establish a standard of care but do not describe in detail many necessary aspects of patient and staff safety on these units. The same levels of concern are not required for all parts of the units. Five levels with increasing patient safety concern and design restrictions have been identified[3] and in Figure 2. They are 1) Staff-Only areas are required to meet applicable codes and regulations. 2) Supervised areas with easy and direct observation of the nurse station, such as Corridors and Group Therapy Rooms, 3) Some Observation areas include TV Lounges and Day Rooms where staff may not always be present. The higher levels of concern are for areas where patients will be 4) Alone for Long Periods of time including the patient rooms and patient toilets. 5) Agitated or New to Staff areas (including Seclusion rooms) have their own unique requirements. Admissions Screening Rooms where staff interacts with patients that may be unknown to them and may become volatile at any moment also require special attention. The precautions for each level also require all of the considerations for the levels below them.

Level 2- Supervised
Corridors within direct line of sight of the nurse station that do not have alcoves or blind spots often have accessible ceilings and standard light fixtures. Also some activity rooms that are only used with staff present such as Occupational Therapy rooms may require this level of precautions. However, patients frequently will work together to distract staff to one area so other patients can access hazardous items in otherwise normally observed areas. Nurse stations are not always staffed, and when there, staff is often charting or engaged in other activities that demand their attention.

Level 3 – Some Observation
Television viewing rooms and other informal, non-structured activity spaces may require fewer precautions than Level 4 spaces. However, doing so should be carefully discussed with the staff of the facility and any potentially hazardous features included should be clearly identified and documented. Light fixtures should have substantial lenses securely anchored in place and the frames should be secured with tamper resistant screws. Accessible ceilings should not be used and all fire sprinkler heads should break-away less than 50 pounds of load without activating the head. Window treatments should not include anything that uses cords, chains or wands for operation. Access to all mechanical units should be secured by locks or tamper resistant fasteners. All cabinet doors should be locked at all times and have flush pulls and recessed hinges. If the cabinets contain articles that are available for patient use, the doors should be removed and the shelves should be securely anchored in place (non-adjustable). Furniture should be very heavy and made to withstand severe abuse and, if possible, anchored in place. Table lamps should be discouraged and care should be taken with the mounting of pictures or artwork that is displayed on the walls. Supply and return air grilles should be security type units.

Level 4 – Alone for Periods of Time
Patient Rooms and Patient Toilets are the most prominent examples of these areas. The tight fit required for doors also presents the opportunity for patients to place an article (such as a strip of bed sheet with a knot in the end) over the door and close the door on the article to create a hanging device or ligature. There are devices available that will sense such activity and activate an alarm. Door hinges are also problematic in that they may provide attachment points for ligatures. Previously, three butt hinges with non-rising pins and rounded "hospital tips" were typically used. However, these provide the opportunity for patients to tie something around an individual hinge while the door is open. Continuous hinges with tapered tops are preferred. The door knob or lever may also provide an attachment point. Standard knobs, levers, paddle type devices and typical pulls are strongly discouraged for use in psychiatric facilities. There are several devices available on the market that attempt to address the potential hanging issues associated with these devices. It is strongly suggested that the doors of vacant patient rooms be locked at all times to help prevent patients from entering them. Locks with a "classroom" function are recommended to help protect against a patient inadvertently being locked in a room.

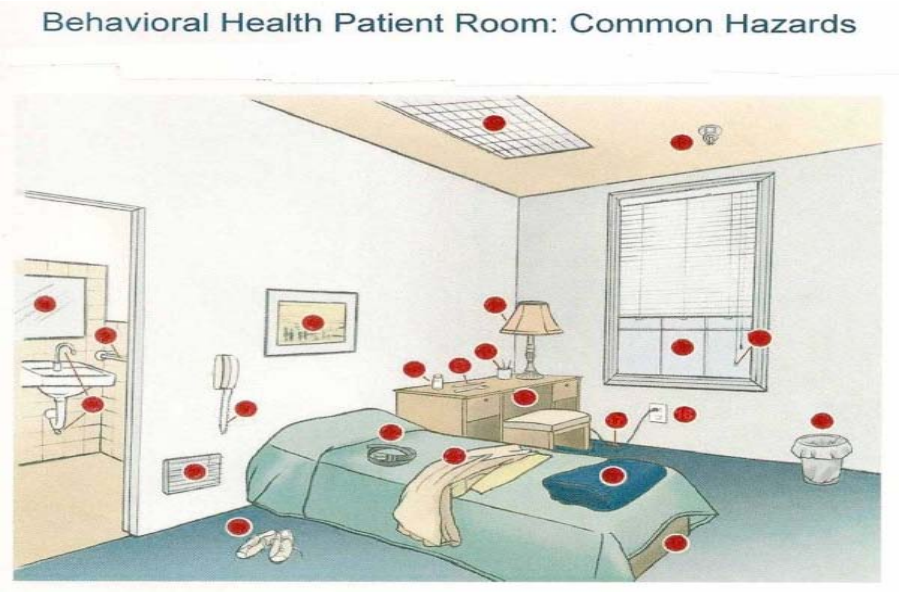

FIGURE 3

The Pennsylvania Patient Safety Authority[4] developed the accompanying illustration Figure 3 of some of their most prevalent patient safety issues reported in 2007. Windows and window coverings also require special consideration. In the past, this was solved by installing very heavy stainless steel screens. These are still used in many facilities, but provide a very institutional or prison-like appearance and patients have been known to use toothpaste or feces to write obscene words in the screens. All window glazing is recommended to be of material that will not be easily broken to produce sharp shards of glass and will stay in the frame to resist egress if broken. Tempered glass does not yield large shards of glass when broken, but does not stay in the frame; laminated glass will stay in the frame, but will yield shards. Polycarbonate sheets will satisfy both of these requirements, (provided that the stops are deep enough to account for the amount of deflection of large pieces), but are susceptible to graffiti being scratched into its surface which may require frequent replacement. There are a variety of new hurricane and bomb resistant glazing materials and even films that can be applied to increase the shatter resistance, but it is not known if any of these have been tested for use in psychiatric facilities.

Window coverings are also an issue. Some facilities are choosing mini-blinds that are mounted inside window assemblies. This can be an acceptable solution, but care must be taken that the knob or whatever device is used for adjusting the blind does not provide an attachment point. Simple casement drapes are often the best solution. They should be made of cloth that is "breathable" and mounted on a track that is anchored tightly to the ceiling with snaps or hook-and–loop tabs for attachment of the fabric. No wands or cords should be provided and an absolute

minimal number of fasteners should be provided to guard against the patients grouping all of them together and using their combined holding force to hang themselves. Mini-blinds and traverse rods with long cords or chains should never be accessible to patients.

Patient room furniture should be anchored securely in place, with the possible exception of a desk chair (if provided). This is to reduce the possibility of patients using the furniture to barricade themselves or otherwise stack or pile the furniture. Patients have been known to use furniture to throw or strike staff. Electric hospitals beds present extreme hazards and have been used in many suicides. As mentioned earlier, cabinet doors are convenient hanging hazards and many drawers can be removed or broken to yield sharp objects that can be used as weapons. Therefore, it is suggested that all cabinet doors and drawers be removed from patient rooms. All shelves should be securely anchored in place and clothes poles and hangers are discouraged. Many facilities are now only providing fixed shelves for storage of patient clothing. The 2006 edition of the "Guidelines" does call for patients to have the ability to hang full length clothing in their rooms. However, this has been removed in the 2010 edition.

Patient toilets are very dangerous areas because patients are alone in these for periods of time without supervision and there are typically many hazards available to them. It is important that the Patient Toilet Room doors swing out of the room to reduce the opportunity for patients to barricade themselves in the rooms, or in the event that a patient should pass out while in the toilet room. These doors themselves present numerous hazards. Several new products are available to replace these doors and some facilities are considering leaving the doors off entirely in single patient rooms. Many considerations for these rooms present a dichotomy of problems.

Towel bars are a good example of the contradictory issues architects must address. If they are easily removed, they can be used by patients as weapons to harm themselves or others. However, if they are securely anchored to avoid removal, they present a hanging risk. Therefore, the "Guidelines" state that towel bars shall not be used. It is suggested that towel hook or robe hooks that collapse under weight be used instead.

Grab bars are not as easily dismissed. They must be provided in at least a percentage of the patient toilets to comply with ADA and other requirements. The most common solution to open grab bars being hanging hazards is to install a typical bar that has had a stainless steel plate welded to the bottom to close the opening. This also creates an undesirable side effect where the plate meets the bottom of the bar that can become an infection control problem. Also, these bars usually do not drain well and will hold water for periods of time when used in showers. There is a bar on the market that is made of extruded aluminum and has a triangular end plate that resists something being

tied around the bar from end to end. This bar can be installed on a slight angle so it will drain and is easily cleanable.

Patients have been known to "hang" themselves from objects as close to the floor as 18" and one study found that 50% of non-judicial hangings were from heights below the waist of the victim[5]. In fact it is possible for patients to strangle themselves to death by attaching a strip of torn bed sheet to a loop imbedded in the floor. It isn't easy and not a rational thing to do, but these patients often have little else to occupy their time other than devise methods of suicide. Therefore, P-traps and water supply pipes under lavatories, flush valves for toilets and even the lavatories themselves and their faucets are potential attachment points for ligatures. Glass mirrors are always a problem as are shelves, soap dispensers, paper towel dispensers and toilet paper holders.

Suggested solutions often vary depending on whether the project involves new construction, remodeling or both. As usual, new construction is the easiest because most plumbing can be concealed in the wall and other items can be recessed to avoid problems. There are a number of products that have been developed to assist with remodeling projects specifically. One example is a stainless steel cover with a sloped top for existing flush valves and related piping. Some of these include a new pushbutton activated valve. Covers are available for the pipes under wall mounted lavatory fixtures. These should be trimmed to fit tightly to the bottom of the fixture to avoid opportunities for patients to hide contraband such as razor blades, drugs or other items they may have obtained. All mirrors should be polished stainless steel, polycarbonate or other non-glass materials. Most of these are susceptible to scratching and may be used to write graffiti that may require periodic replacement. It is not uncommon to find hard plastic paper towel dispensers and soap dispensers on units now. These can be fairly easily removed from the wall and broken to yield very sharp pieces of plastic that can be used as weapons. Products are available or being developed that is made of heavy gage stainless steel or solid-surface material that provides substantially more safety for patients. Toilet tissue dispensers also can be hanging hazards and the spring loaded tubes that hold the paper can have the spring removed or be smashed and made into sharp objects. A solution for this is a stainless steel tube that is recessed into the wall to hold the entire roll. Recently there have been some objections to this as an infection control issue because everyone using the roll has to handle it. Another option is a product that is made of solid-surface material that uses a foam cylinder to hold the roll. The lavatory faucet and valves themselves also provide attachment points. There are several products available from complete lavatory/faucet sets to replacement faucets and valve assemblies that address these issues. Shelves to hold toiletry items can also be a problem. Stainless steel products are now available that resist attachment of ligatures to a much higher degree that typical units.

Patient showers and tubs are of major concern. Tubs should only be used by patients while under direct supervision of staff. The obvious hazard of potential drowning plus the added issues of valves and fill spout are problematic. Showers can be used by patients if careful attention is given to all aspects of the design of the room. "Institutional" type shower heads have been around for a number of years and work well in this environment. Water control valves are much more difficult to provide safely. For new construction, there are some valves available that have proven themselves in this market. For remodeling work, there are some units available with stainless steel covers that can be fairly easily attached to existing supply lines and the cover opening made in the wall and come with the head and valve already mounted. Soap dishes should be recessed and not have grab handles. The grab bars should be as discussed above. If possible, the shower stalls should be designed so that a shower curtain is not needed. If necessary, an aluminum track similar to the window curtain track discussed above should be provided. Care should be taken to provide an absolute minimum of tabs because they can be grouped together and their holding weight can be additive. Also note that the weight can be added very slowly so no jerking motion is exerted to help loosen the hangers. The shower curtains themselves should always be a "breathable" material such as woven fabric with applied waterproofing. As always, light fixtures in the patient toilets and showers should be security type with fully enclosed frames, polycarbonate or similar, lenses and security fasteners.

Level 5 – Agitated or New to Staff
Seclusion Rooms are clearly defined in the "Guidelines" and will not be elaborated on further. Admissions Screening Rooms or Intake Assessment areas are of serious concern because this is where staff first encounter patients who are unknown to them and patients can become very agitated and violent when they realize they are going to be admitted. These rooms should have a minimum of furniture and everything possible should be securely anchored in place. Computers, phones, cords and cables should be kept as far away from the patients as possible. It is recommended that two staff members be in this room with the patient at all times.

Solutions
Space does not allow detailed discussion of solutions to all of these problems and the answers often get very specific as far as manufacturer and model. A device that is perfectly acceptable for one patient population may not be acceptable for another.

One source for assistance with these issues is "The Design Guide for the Built Environment of Behavioral Health Facilities"[3] which was co-authored by these writers.

Therapeutic Environment
The other major element of psychiatric hospital design is the therapeutic environment. This has been increasingly neglected in recent years. Sometimes patient and staff

safety seems to be the polar opposite of therapeutic environment; they do not need to be. The two concepts need to be combined in a well-designed facility. A therapeutic environment is usually defined as being one that resembles a "typical residential" atmosphere. Providing this would be a safety disaster for a psychiatric hospital. The architect must work closely with the user groups, interior designer psychiatric hospital consultant and the "Guidelines" to find the right mix of all of these viewpoints. This mix will likely be different for each hospital and sometimes each unit within a facility will present different requirements. Some of the factors may be their patient populations, age groups, diagnosis, private or public, voluntary admission or court committed and many others.

Many of the Planetree[6] concepts can be applied to behavioral health units. At the very least, attention can be paid to color, texture and the use of natural materials such as transparent wood finishes. Lighting can be very important and is very difficult to do well and safely. If exposed bulbs are to be used, there are shatter resistant coated bulbs are preferred. One problem with these is that if the patient can remove the bulb, they have access to the electrical contacts. Furnishings are another key element in the overall appearance of the units. Soft, upholstered furniture with wood accents and constructed to withstand severe abuse is one popular choice. This can still be anchored in place to avoid stacking or throwing. Table lamps are very difficult to do well and are generally avoided. Bathrooms are very difficult to design safely and compromises in these rooms can have disastrous results. Of course, the typical code issues of exit lighting, fire sprinklers, fire extinguishers, etc. must be provided regardless of "institutional appearance".

Conclusions
Psychiatric inpatient facilities present a very unique set of challenges and the solutions are often the opposite of what is typically done on medical/surgical units. Design professionals who do not address these issues carefully may be incurring major liability should a successful suicide or staff assault occur in an improperly designed unit that doesn't meet the requirements of the "Guidelines" or a reasonable standard of care.

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