

White Paper

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Inboard vs. Outboard vs. Nested Toilet Rooms and the Bariatric Patient

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With more than 34 years of hospital experience and 32 years of nursing experience, Jeri is experienced in a wide variety of clinical settings with diverse cultural and socio-economic clientele. As the Nursing Advisor / LEAN Operations Facilitator for Burt Hill, she acts as a liaison between healthcare facility employees and the design team to assist in meeting the needs of the staff to develop the best design outcome. As an experienced nurse, Jeri draws from her hands-on experience in a variety of medical fields: medical/surgical, ICU, CCU (including open heart), neurology and rehabilitation, burn unit, orthopedics, pediatrics, NICU, newborn nursery, labor and delivery, postpartum, and adult and adolescent psychiatry.

Introduction

It has been proven that healthcare facilities find themselves dealing with an aging and increasingly more obese, more medically complex patient with an increased risk of in-hospital falls, being cared for by an aging, increasingly more obese nurse workforce impacted by the nursing shortage. According to a United States Department of Health and Human Services 2004 survey (published in 2007), the average age of today's nurse is 46.8 years. Because many RNs are approaching retirement age and the nursing profession faces difficulties attracting new entrants and retaining the existing workforce, the RN supply remains flat, with a projected increase in the shortage over the next two decades.

In a newly published paper, statisticians at Boston College reveal that in France, the average life expectancy is 80 years. Since the turn of the century, the life expectancy of U.S. citizens has increased from 45 to 78 years. However, in Japan and Switzerland, men and women aged 65 now live several years longer than those in the United States. There has been an unbroken rise in life expectancy since 1960 in every other developed country. This no longer applies to the United States, where the rise of life expectancy has slowed as adult obesity rates rose in 31 states in 2007, according to the fourth annual "F as in Fat: How Obesity Policies are failing in America" 2007 report from the Trust for America's Health (TFAH). Twenty-two states experienced an increase for the second year in a row, while no states decreased. As rates of longevity and obesity rise, so do risk factors of hospitalized patients. The unfamiliar and potentially hazardous environment increases the vulnerability of the patient. Patient falls are a challenging safety and quality of care issue in the hospital setting.

Bathroom Falls

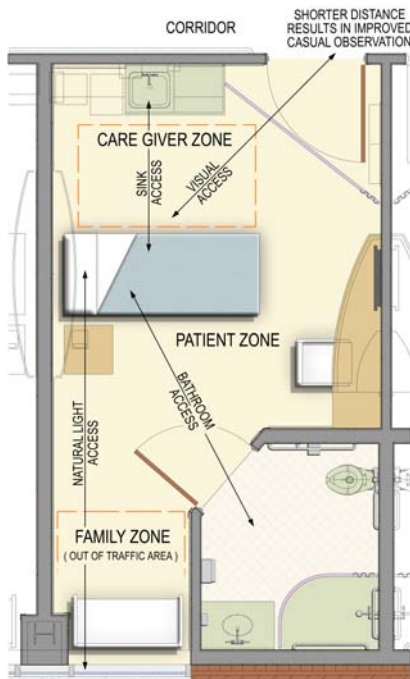
Falls are consistently the largest single category of U.S. hospital inpatient incidents, constituting 70-80 percent of incident reports published since the 1940s, according to a study in the American Journal of Public Health, July 1985. A finding of interest was the high proportion of falls (29%) that occurred in the bathroom. Hitchcock and Associates, in the *Journal of Internal Medicine*, 2004, showed that 19.1% of

patient falls occurred during ambulation, 10.9% when getting out of bed, 9.3% while sitting down or standing up and 4.4% while using the bedside commode or toilet. In 2007, Krauss and colleagues, in *Infection Control and Hospital Epidemiology*, showed that 79.5% of falls occurred in patient rooms, 11% in patients' bathrooms, and 9.5% in hallways, exam or treatment rooms, or by the nurses' stations. The trend toward private rooms with bathrooms and greater emphasis on patient ambulation may simultaneously increase exposure to risk and decrease surveillance by staff and fellow patients. The National Center for Injury Prevention and Control, Atlanta, reports that falls are the leading cause of deaths from injury for the elderly, accounting for more than 10,000 deaths each year. Overall, 20-30 percent of falls result in injury, but the rate may be higher in hospitals. For example, Barnes-Jewish Hospital in St Louis reports that 42 percent of its patients involved in falls were injured to some extent.

The Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) instructs hospitals to "assess and periodically reassess each patient's risk for falling and take action to address any identified risks, i.e.: patient's medication regime, gait disturbances, mental confusion." According to a study in the *Journal of Forensic Sciences*, falls cost hospitals \$20.2 million per year in diagnostic tests, injury repair and rehabilitation, legal expenses, and patient and family dissatisfaction.

Designing Safe Patient Rooms

With fewer nurses, families will be assuming more patient care responsibilities. The patient room must be designed with space and amenities so that families can continue their lives while assisting in patient care. When designing a patient room, the needs of each group (patient, family, and caregiver) must be taken into consideration in order for the room to be functional and follow the Lean for Healthcare philosophy. Lean for Healthcare means meeting the needs of patients and staff by providing efficient, quality care in a timely fashion through the elimination of waste, benefiting the organization both financially and culturally. Dividing the room into three zones, one each for patient, family and caregiver, helps define the needs of each group. For the purposes of this article, we will focus on the "patient zone." The bed is the main feature of the patient zone and must allow easy access to the bathroom in order to decrease patient and/or caregiver risk for injury. Considering this, what is the best location for a bathroom (toilet room) in a patient's room?

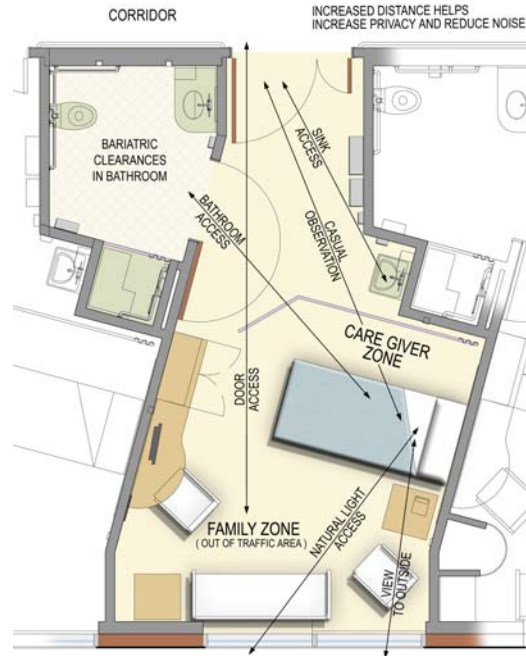


Outboard Toilet Rooms

An "outboard" toilet room, located along the exterior wall, allows maximum visibility into the room for staff but less space for family members. It also decreases the window space, which in turn decreases the amount of natural light coming into the room for the patient. This may not be the best choice ergonomically as it increases the travel distance from the door to the toilet room for the nurse/caregiver who may need to be monitoring the patient's urine output or doing urine dipsticks, even if the patient does not require toileting assistance. There would also be an increase in travel time/treatment time in response to a patient who has fallen or had an emergent event in the toilet room. Increasing steps or travel distance does not support the Lean philosophy, adds stress to an aging workforce, and increases risk factors for patient and staff.

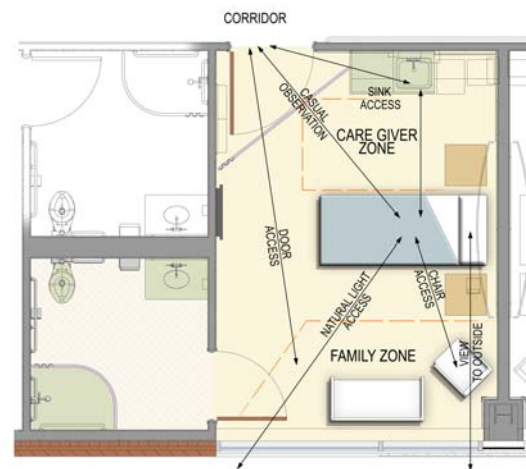
Inboard Toilet Rooms

An inboard toilet room, located along the corridor, allows for a larger window, providing the maximum view and access to light and space for the family. However, this layout places the patient behind the toilet room, which makes staff observation difficult without entering the room. To counteract this design flaw, a unique approach was taken at UPMC Passavant Hospital during a recent project. As reported by Tim Schmida, Director Emeritus at Burt Hill, "In order to enhance the staff's ability to see the patient, and increase safety, the rooms at Passavant Hospital, UPMC Pittsburgh, were 'twisted' so the patient is away from the corridor." The patient room door, which can be kept closed, has a glass light with an outside controlled blind so the staff can observe the patient without opening the door. It also decreases the amount of light from the hallway at night and disruption of the patient. It makes the room quieter because the patient is no longer adjacent to the corridor, and the hum of the hospital, but instead has an intervening toilet room and vestibule. This vestibule allows for placement of a hand washing sink immediately inside the door, which promotes hand washing on entering and leaving the room to decrease cross-contamination risks. The inboard toilet room keeps clear delineation between the three zones and reduces the caregivers' steps. Placing room functionalities where they aid efficiency follows the lean philosophy to save time and labor costs. Having universal beds with built in alarms will help lower the risk of decreased visibility of the patient.



Nested Toilet Rooms

According to the article "Tomorrow's Patient Room," appearing in *Architecture Week*, "side version" or "nested" toilet rooms, with the toilet rooms located side-by-side between patient rooms, may be the best of both worlds by allowing a view of the outside and adequate family space while maintaining staff visibility into the room. However, this design is not Lean compliant because the floor plan is three feet longer than typical patient rooms along the corridor, thus increasing travel times and steps for nurses and all caregivers.



Designing For The Bariatric Patient

Another consideration is the bariatric patient. Obesity is not considered a legal disability and is not covered in the Americans with Disabilities Act. The majority of U.S. hospitals are under-equipped to accommodate the growing number of bariatric patients and their families, who are often also obese. The American Institute of Architects (AIA) and the Americans with Disabilities Act (ADA) do not provide guidelines on physical design associated with the care of obese patients. The AIA is proposing new

bariatric guidelines, completely separate from the ADA rules, which are currently available for review and will be included in the AIA guidelines for 2010. Guidelines for toilet rooms will include door widths of three feet, six inches, and call for toilets to be centered 24 inches from a wall, made of stainless steel, and floor mounted with a capacity of 1,200 pounds. Sinks should also be floor mounted, 24 inches on the center, and withstand 500-800 pounds, and walls should have extra strength-blocking to support grab bars able to bear up to 800 pounds. There are many reasons why design guidelines for bariatric patients are needed, but perhaps the most important reason is to retain patient dignity. Considering the trends toward obesity and the increase in bariatric surgical programs, hospitals must address the special design and equipment needs of obese patients.

Staffing implications when caring for obese patients should also be considered in the design process. According to the Bureau of Labor Statistics, the healthcare profession boasts one of the largest rates of non-fatal occupational injuries and illnesses in the nation involving missed workdays. An estimated 12 percent of nurses annually leave their profession due to back injuries, and more than 50 percent complain of chronic back pain. The cost of equipment to assist with the movement of obese patients is significantly less than the costs of workers' compensation claims related to staff injuries from assisting in the movement of obese patients. Costs associated with each back injury claim range from \$5,000 to \$100,000. Indirect costs, including lost workdays, increase that number. Well-designed lifts simplify patient transfer and can reduce staff injuries involved with lifting patients. Whether portable or ceiling mounted, having a lift in these patient rooms is a necessity and can greatly aid in the transfer into the toilet room.

Final Recommendation

In conclusion, whether it is for a geriatric, obese, or disabled patient, toilet rooms should be designed to accommodate all three patient types. Although they each have different, specific needs, there will be times when patients will have not only one, but all three need types. In this nurse's opinion, a single patient fall is one too many and one nurse injury is one too many, so it is important to reduce the risk of either by perfecting the design. Therefore, the inboard toilet room offers the best design for decreasing the risks to both patient and caregiver, and is the most efficient design by Lean philosophy standards. Each nursing unit should be designed with a variety of rooms with accommodations to meet not only the AIA guidelines for ADA, but also the proposed AIA guidelines for obese and bariatric patients. Handrails from beds to toilet rooms could help, but patient lifts are a necessity.