

# Reconsidering the Semiprivate Inpatient Room in U.S. Hospitals

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## Abstract

In the past 5 years, U. S. hospitals have virtually abandoned the semiprivate inpatient room. The inconclusiveness of recent research, however, indicates that this room type remains a potentially viable care delivery setting in both developed and developing countries for specific patient cohorts and care scenarios during hospitalization. Although the U.S. healthcare industry has embraced the all-private room hospital, does the semiprivate room have a place at all in the 21st-century American hospital? Literature on the subject, both for and against, is summarized. This is followed by a proposal for a case study prototype and its functional integration within a conventional medical/surgical unit in a U.S. hospital. The results suggest that a tempered reintroduction of semiprivatism affords opportunities for socialization, patient-family transactions and amenities, and staff effectiveness without compromising patient safety. Implications for environmental stewardship with respect to the carbon-neutral hospital of the 21st century are cited, as are priorities for further evidence-based design research on this issue.

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## Introduction

The semiprivate inpatient room in U.S. hospitals has become an endangered species. Proponents of the all-private-room U.S. hospital argue that the continued use of the semiprivate room is counterintuitive to progressive healthcare philosophies and care delivery protocols. As older U.S. hospitals are being replaced with new facilities and new, first-time hospitals are built, this room type is being deleted from the equation. To proponents, the all-private-room hospital addresses concerns about the rise of nosocomial infections, a host of adverse medical events, the present age of consumer-driven healthcare, and recommended minimum design and construction guidelines (Verderber, 2010a, 2010b). Additional factors include calls for a patient's right to privacy, specifically within the parameters of the Health Insurance Portability and Accountability Act (HIPAA).

All-private-room facility configurations have become an expression of a hospital's overall progressiveness, particularly from a marketing per-

spective. This is especially the case in large urban markets where informed patients and care providers, particularly physicians, may have multiple options for patient referrals. The all-private-room hospital, in short, is currently upheld by the mainstream healthcare industry in the United States to be perhaps the most visible, tangible expression of the patient- and family-centered care movement that has blossomed in the past decade. This “buy-in” on the part of hospitals is occurring rapidly, having acquired unprecedented momentum in the past 5 years.

Evidence remains, however, in support of an alternative paradigm. In some situations, a blend may be preferable—a complement of semiprivate inpatient rooms with a majority of private rooms. This pertains to the renovation of older medical/surgical (M/S) units as well as to new construction. This alternate perspective is rooted in patient safety, socialization factors, staff effectiveness, third-party reimbursement, and facility management realities. Uncertainties associated with federal healthcare reform legislation and the burgeoning movement toward a carbon-neutral hospital and campus may also influence a decision to provide the option of a semiprivate room.

Added to this is the continued practice of hospitals around the globe to continue to staff semiprivate rooms for inpatients during hospitalization. In these contexts, room configurations may house two to four or more beds within a single, shared space. Do semiprivate inpatient rooms exist globally for no other reason than to constraint cost, or do they continue to be relied

upon for other reasons? The Netherlands continues to build new hospitals with a mixture of both inpatient room types, including the Martini Hospital (2008) in Groningen. Similarly, in the United Kingdom, the Evelina Children’s Hospital (2004) in London features a high percentage of four-bed inpatient suites in its total bed count (Verderber, 2010a).

The aims of this discussion are twofold: First, to examine the literature that compares the advantages and disadvantages of the semiprivate inpatient room in relation to the all-private-room M/S unit in U.S. hospitals. The main objective here is to examine *semiprivatism*—that is, one’s 24/7 immersive experience while occupying a semiprivate room—vis-à-vis the benefits of socialization, staff effectiveness, infection control, and the occurrence of numerous types of adverse medical events. The second aim is to present a hypothetical case study that addresses retrofitting possibilities associated with an existing all-private-room M/S unit within a recently opened U.S. hospital. This discussion is neither in theory nor in practice to be misconstrued as an either/or dialectic, i.e., as an argument for either an all-private- versus all semiprivate-room inpatient unit. Rather, the position explored is that semiprivatism, as part of an overall mix of room types, may have potential relevance for particular inpatient populations, i.e., pediatric, and whole-organ transplant patients.<sup>1</sup>

### Current Trends

Multiple inpatients occupying a single room during hospitalization have been a reality of inpatient

care around the globe throughout recorded history. This pattern has endured since the large open-courtyard hospitals of the ancient Middle East, the chapel ward hospitals of the Middle Ages, to the predominance of the Nightingale Ward of the 19th century, to the era of the post-1946 Hill-Burton hospitals and into the 1970s (Goldin, 1994; National Nursing Research Unit, 2009; Romano, 2005; Verderber, 2010a; Verderber & Fine, 2000).

In the United States, the Hill-Burton hospital M/S unit configuration template typically consisted of a double-loaded corridor with semiprivate rooms strung along both sides. Most hospitals built in America during the 1960–1990 period offered a mix of private and semiprivate inpatient rooms. In the 1990s, the discourse in the United States began to shift toward a debate over privacy versus patient safety. As a result, hospitals across the nation caring for patients in both private and semiprivate patient rooms began the process of transforming semiprivate patient rooms into private rooms.

The all-private model gained popularity after the first Planetree 13-bed unit opened in a 310-bed hospital in San Francisco in 1985 (Verderber & Fine, 2000). Within the past 2 decades, the United States has virtually abandoned the unit configuration of two (or more) patients occupying a single room. Nonetheless, it remains a standard practice in developed as well as developing nations around the world (Calkins & Cassella, 2007; Verderber, 2010b). By contrast, nearly every inpatient room built today in the United States is a private room.

In 2003, the American Institute of Architects (AIA) and the Facility Guidelines Institute (FGI) began the process of revising the 2001 edition of the *Guidelines for Design and Construction of Hospitals and Health Care Facilities*, the AIA-sponsored reference for facility planning and design standards. This benchmark is widely used by architects, engineers, and healthcare professionals. At present, more than 40 states and the Joint Commission on Accreditation of Healthcare Organizations reference the *Guidelines* for the licensure or accreditation of healthcare facilities. In addition, the federal government references this document in regulating HUD 242 loan guarantee programs and Department of Health and Human Services medical facilities.

Considerable effort and debate were devoted to determining whether to require all-single-room occupancy as a minimum, versus some continued role for semiprivate rooms. The FGI commissioned a study and funded the Coalition of Healthcare Environment Research to examine current research and best practices on the subject. Several key issues were addressed in a subsequent comparative study of 10 inpatient M/S units, representing a mix of semiprivate and private versus all-private rooms: first costs and ongoing operational costs, facility management issues, overall hospital design implications, disease control and falls prevention, and therapeutic impacts (Davis Langdon Adamson, 2003).

In a presentation at the Healthcare Design 03 conference, Roger Ulrich (2003) concluded that single rooms are superior investments with re-

spect to nosocomial infection rates, patient falls, patient transfers, medication errors, noise, sleep quality, quality of staff communications, patient confidentiality and satisfaction, initial construction costs, and life-cycle operating costs and revenues. One factor not cited by Ulrich but perhaps of some relevance here is the issue of the increasing demographic heterogeneity of a U.S. population that has now reached 308 million (as of the 2010 Federal Census). In his conclusion (entitled “What To Do If a Hospital Has Many Double Rooms”), he recommended lobbying for the construction of a new building or nursing unit with all-single rooms; the conversion of existing double-occupancy rooms to singles, because “older doubles often are small—about right [sized] for today’s single rooms”; the conversion of a patient room on the unit into a privacy refuge; and the provision of close, convenient, overnight accommodations for family members (Ulrich, 2003).

The 2006 edition of the *Guidelines* subsequently mandated the construction of all-private-room inpatient M/S units “unless the functional program demonstrates the necessity of a two-bed arrangement” (Burnette, 2006). As a result, since its publication, the already-pronounced shift toward the all-private-room hospital has acquired even more momentum. The semiprivate room’s mandated obsolescence, however, may have been premature. Mounting evidence suggests that new rooms have increased in size (Hutlock, 2010). They are equipped with more amenities than before. They include desks for family use, personal refrigerators, additional storage, expanded space around the bed, and overnight accommodations, often in the form

of foldout beds. This mandate, coupled with the sheer growth in the internal size of individual inpatient rooms, threatens to expand, in the aggregate, the size of overall hospital facility envelopes.

Without question, the inpatient room in American M/S units has undergone a significant transformation in the past decade. Over a recent 10-year period, construction costs associated with single-bed inpatient rooms increased in total net square footage (NSF) by 77%, (Latimer, Gutknecht, & Hardesty, 2008). More significantly, M/S units, on average, correspondingly experienced an even more pronounced increase in size of 118% since 1988. This has resulted in adult acute care bed space of 720 NSF in M/S unit total departmental gross square feet (DGSF) per patient bed from approximately 335 NSF (Latimer et al., 2008). Additional amenities such as dayrooms, decentralized nursing stations, and related support spaces have accounted for much of the additional growth.

The aforementioned analysis of 10 nursing units with varying configurations, some featuring exclusively private patient rooms and some a combination of private and semiprivate rooms with equal construction costs per square foot, found that first costs for an all-private inpatient M/S unit averaged \$182,400 per patient, compared to \$122,550 per patient in mixed private and semiprivate room arrangements (Davis Langdon Adamson, 2003, as reported in Malkin, 2008).

All-private-room hospitals do not limit room assignments, thereby allowing a hospital to achieve,

at least in theory, full occupancy (Detsky & Etchells, 2008). The need to assign patients to rooms based on gender or diagnosis is often cited as a limitation of the semiprivate model. Private inpatient rooms tend to preclude the need for room-to-room patient transfers caused by infections or personality conflicts, thereby lowering the risk of infection during transfer. This may also tend to reduce associated demands on staff and minimize potential confusion and errors caused by relocations (Noskin & Peterson, 2001). In addition, adverse medical events in hospitals, including nosocomial infections and patient falls, have been associated with more than one patient sharing a room (Gesler, Bell, Curtis, Hubbard, & Francis, 2004).

However, a direct correlation has not been proven between multibed rooms and adverse medical events (Ben-Abraham et al., 2002; Cepeda et al., 2005; Chaudhury, Mahmud, & Valente, 2005; Joseph, 2006). Other factors, including hand washing and associated personal hygiene habits, old or ineffective air filters, and staff stress factors, *have* been associated with adverse medical events (O'Connell & Humphreys, 2000). One recent empirical study ascertained a causal effect between isolation rooms and a reduction of nosocomial infections in a pediatric M/S unit. Isolation was attributed to demonstrable positive measures on reduced hospital-acquired infection rates, yet the researchers could not conclude whether this was due to the design attributes or the occupancy level of the room itself (Ben-Abraham et al., 2002).

Research-based evidence in support of the all-private-room M/S unit therefore remains rela-

tively limited (NNIS System Report, 2004). Meanwhile, as mentioned, multibed configurations of up to six beds per single room remain a standard format in healthcare facilities globally, including countries where positive patient outcomes are comparable to or better than those in the United States (Ben-Abraham et al., 2002; Cepeda et al., 2005; Kibbler, Quick, & O'Neill, 1998). The University Medical Center of Hamburg-Eppendorf, a recently opened hospital in Hamburg, Germany, rejected the use of all-single-bed inpatient rooms in favor of a blend of multibed room configurations (three to six beds), citing patient safety and patient social connectedness as primary reasons for doing so (Nickl-Weller & Nickl, 2009).

Although recent research suggests lower nosocomial infection rates in private rooms, this evidence remains hamstrung by the complex, multifactorial nature of such infections, thereby rendering it difficult to perform highly controlled trials (Dettenkofer et al., 2004; Devlin & Arneill, 2003; Eggimann & Pittet, 2001). Methicillin-resistant *staphylococcus aureus* (MRSA) infection is not abated by common antibiotics. Each year hospital-based staph infections sicken more than 90,000 Americans and kill 19,000 (Knox, 2010). In a recent study funded by the U.S. Centers for Disease Control and Prevention, it was found that the rate of MRSA infections in hospitals in nine U.S. cities decreased by 28% where MRSA rates were studied over a 4-year period (Kallen et al., 2010).

All reports of laboratory-identified episodes of invasive (from a normally sterile body site)

MRSA infections were evaluated and classified based on the setting of the positive culture and the presence or absence of healthcare exposures. The decrease was most pronounced in the reduction of hospital-acquired infections. The authors concluded that multiple factors contributed to this decrease, especially improved hand-washing protocols and compliance levels. A similar trend has been occurring in U.S. Department of Veterans Administration hospitals, and this was also attributed to improved hand-washing protocols and compliance factors more than any other single factor (Evans et al., 2010). In The Netherlands, where semiprivatization remains dominant, infection control rates as low as 3.1% remain the norm, compared to a national average of 4.5% in the United States (Van de Gling, de Roode, & Goossensen, 2007). These recent data suggest the greater significance of nonarchitectural factors, that is, human behavior above and beyond the sheer influence of private versus semiprivate inpatient room typologies.

### **Case Study: Medical University of South Carolina, Charleston**

The site chosen for the case study was the Renal Transplant Inpatient Unit (RTIU) at the Medical University of South Carolina (MUSC) in Charleston. This inpatient population (whole-organ transplant patients) was identified as potentially benefitting from semiprivatization. The average length of stay (ALOS) of organ transplant patients before, during, and after surgery for recovery and rehabilitation is longer than for most other patients. This comparatively prolonged ALOS provides patients who might be sharing a

room an opportunity to benefit from fostering a relationship with a roommate: this can result in the mutual support needed to endure the requisite recuperative phase successfully. The current RTIU at MUSC is comparable to the industry-wide standard (320 NSF/bed) and as built utilizes exclusively private patient rooms throughout. The following alternative architectural proposal for the redesign of the RTIU entailed its hypothetical conversion into a mixture of private and semiprivate inpatient rooms.

Situated in the heart of Charleston along the Ashley River, the RTIU at MUSC is unique in South Carolina. This unit offers patients a spectrum of transplant services. The recently opened (2009) Ashley River Tower (ART-1) at MUSC was selected to hypothetically test the design prototype. The footprint and scale of this facility are planned to be repeated another five times as MUSC expands over the next 20 years.

ART-1 is situated at the center of a 178-year-old campus. Two dedicated floors (floors 4 and 5) currently house organ-transplant patients. One floor is devoted entirely to the care and recovery of bone marrow transplant patients, who tend to be the sickest and generally require isolated positive-pressure patient rooms because of their suppressed immune systems. For this reason, this cohort was not included in this investigation. The other floor is dedicated to kidney transplant patients awaiting and/or recuperating from surgery.

Data obtained from the staff confirmed that kidney transplant patients would be a suitable cohort for

this investigation. Staff confirmed that kidney transplant patients, in addition to their acuity level, frequently experience a need for emotional empathy and support prior to and after surgery. This condition generally tends to be ongoing, requiring multiple visits and stays at the hospital before, during, and after surgery for rehabilitation, thus providing patients a genuine opportunity to build upon and benefit from lasting social relationships. These patients are not as immunocompromised as bone marrow transplant patients; thus, they are more qualified and suitable for semiprivatization.

A post-occupancy evaluation (POE) was conducted on the unit. The methodology consisted of walk-through-based focus groups that included nursing staff, physicians, and facility management staff. Observational data of staff behavioral patterns were recorded, that is, walking and task-movement activities, diagrams of patient and family patterns of movement, and photographic documentation. Content analysis was performed on the focus group data.<sup>2</sup> The RTIU POE revealed average travel distances comparable to other recently built similar inpatient units in the United States insofar as for every 30' of corridor traveled a nurse is able to reach two patients in two separate inpatient rooms. It was also found that staff and patients were, in general, satisfied with the physical setting.

As for the physical attributes of the unit itself, the ART-1 RTIU building envelope is a 30' × 30' structural grid. It accommodates two private inpatient rooms per 30' bay width-depth

dimension. The patient room farthest from the central nurses' station requires staff to travel approximately 110 linear feet of corridor, and the patient room farthest from the central support core requires nurses to travel 111 linear feet of corridor. The ART-1 RTIU comprises 21 identical, universal private inpatient rooms of 290 NSF each, including the adjoining toilet room.

The rooms are arranged in a mirrored configuration across the unit with a decentralized, distributed nurse work station between every other inpatient room. The total gross square footage of the RTIU is 17,048 DNSF/floor; 39% of that space is dedicated to patient care, 24% to internal circulation, 19% to support space, 8% to administration, 6% to building services, and 4% to public circulation. The toilet room provides an open, unrestricted layout for personal hygiene. A relatively small family zone is provided for visitors and families because of the toilet location (on the outboard side of the room), which also, unfortunately, limits room occupants' access to daylight and views.

The RTIU POE data provided a benchmark for evaluating the impact of a redesigned semiprivate inpatient room on the unit and how the dedicated patient care space would be affected. The existing RTIU provides 812 DGSF per patient bed. Ultimately, the research goal was to decrease the DGSF required to care for the same number of inpatients vis-à-vis a redesigned room-to-bed-ratio scenario—in this case, accommodations for the same number of beds (21) without altering the template of the building envelope. In ad-

dition, the POE yielded 15 RTIU retrofit design guidelines for pediatric, rehabilitation, and organ-transplant patients. These addressed inpatient room features, that is, room size, views, natural daylight, personal space, family niches, corridor visibility, and flexibility. Additionally, they addressed issues of socialization with respect to inpatient populations, that is, one’s age, prognosis, length of stay, and type of diagnosis. Unfortunately, space limitations preclude a detailed presentation of the POE portion of the overall study here.

The existing RTIU contains entirely single-bed rooms (Figure 1). This existing floor template is contrasted with the “after” series of interventions, resulting in a mix of one-bed rooms with two-bed suites. Changes introduced consist of the

bathrooms having been relocated from the out-board side of the rooms to the inboard side, the addition of new shared back-to-back headwalls, connecting entry thresholds between suites, and a reconfigured (widened) entry portal from the corridor (Figure 2).

Specifically, from the patient’s perspective, the redesign achieves a separate direct view of the outdoors and nature to a fuller extent than previously. The patient’s closet is enlarged and located to help distinguish a family area from the patient area. The placement of the beds encourages social interaction and mutual support. A sliding digital panel guided by a track in each suite provides each patient with personalized access to media and visual/acoustical privacy. This panel can be repositioned based on patient preference. A sepa-

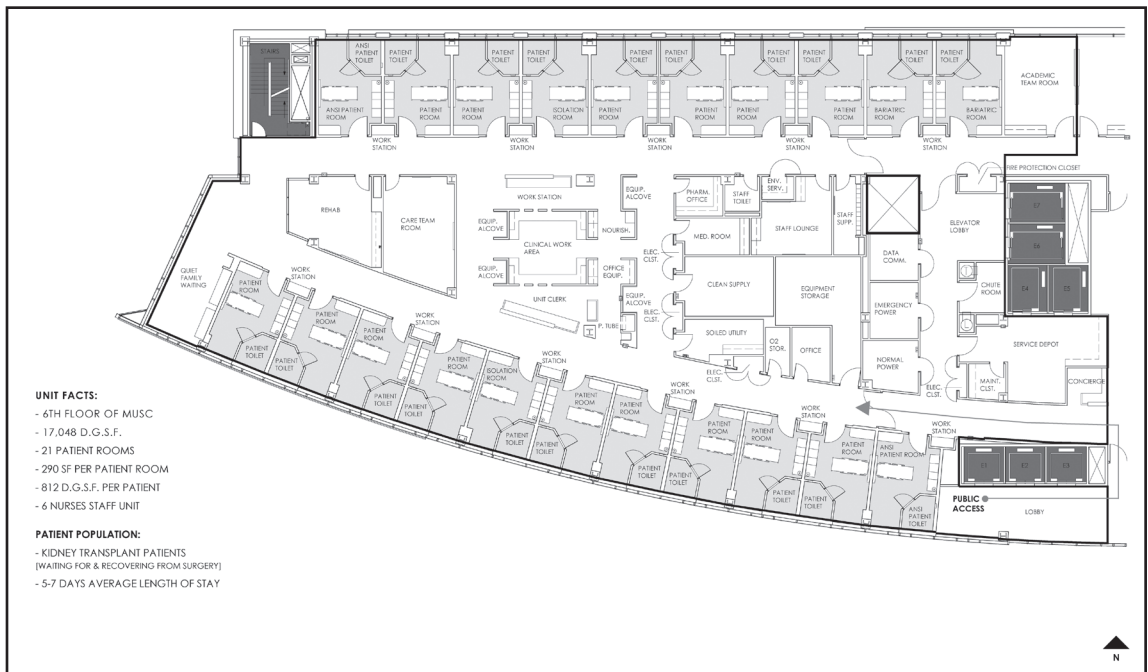


Figure 1. Existing configuration of inpatient care unit.





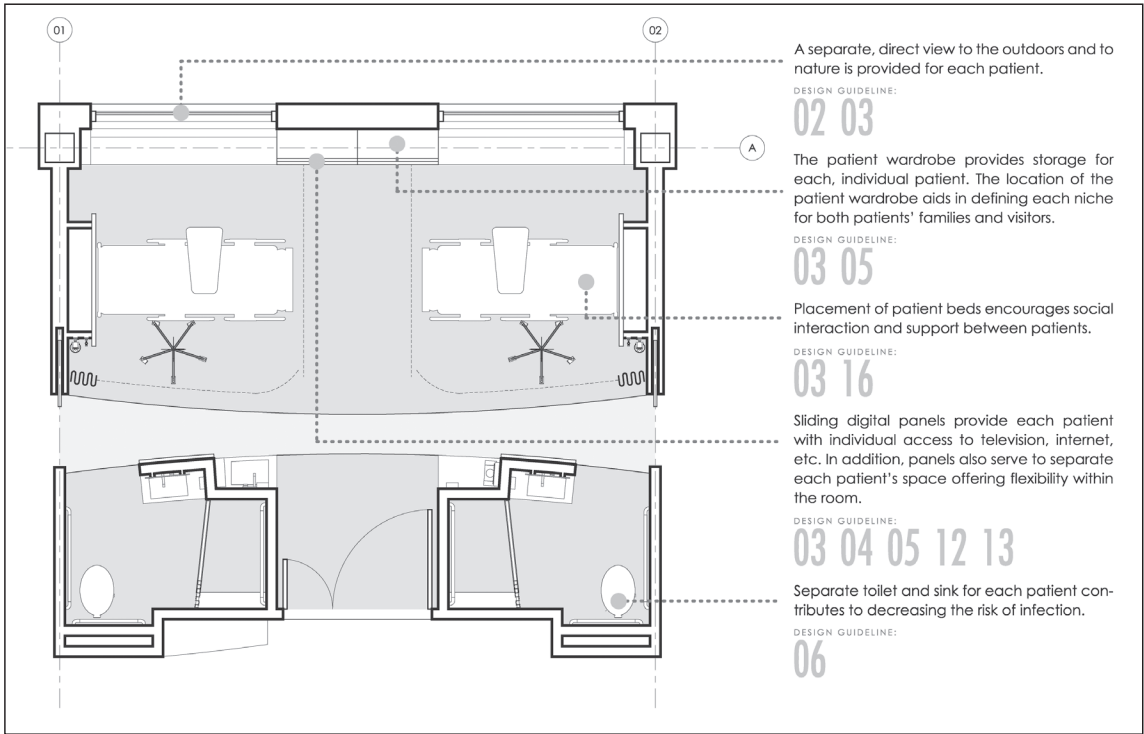
**Figure 2.** Proposed reconfiguration of inpatient care unit.

rate toilet and sink are provided for each patient to help decrease the rate of infection (Figure 3). The fixed wall between connecting rooms contains a sliding pocket door along a secondary staffing corridor.

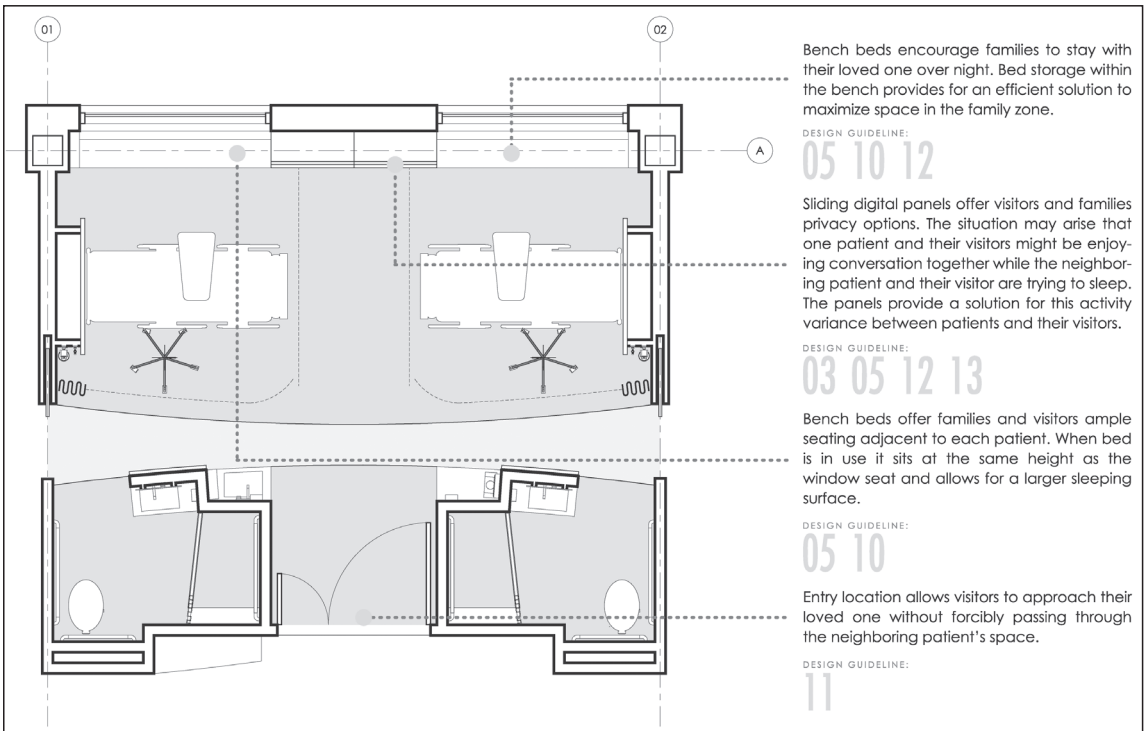
Frequently, in traditional semiprivate patient rooms, the bathroom is closer and more accessible to one patient than the other. A redesigned semiprivate room should offer both patients equal access and minimal travel distances over open space from the patient bed to the bathroom. A perhaps overlooked feature of semiprivatism is the opportunity for increased staff observation and for patients to “watch over” one another. If one patient were to fall on the way to the bathroom and be unable to call a nurse for help, the neighboring patient would be in the room to witness what happened and perhaps be able to call a nurse immediately.

From the family/visitor perspective, the redesign achieves numerous affordances. These consist of a window seat/bench that contains a foldout bed for overnight accommodations that doubles as a seat adjacent to the patient’s bed. The aforementioned sliding digital panel provides numerous privacy options for family and visitors. The entry portal to the room allows visitors to approach the patient without directly passing through the adjacent patient’s personal space (Figure 4).

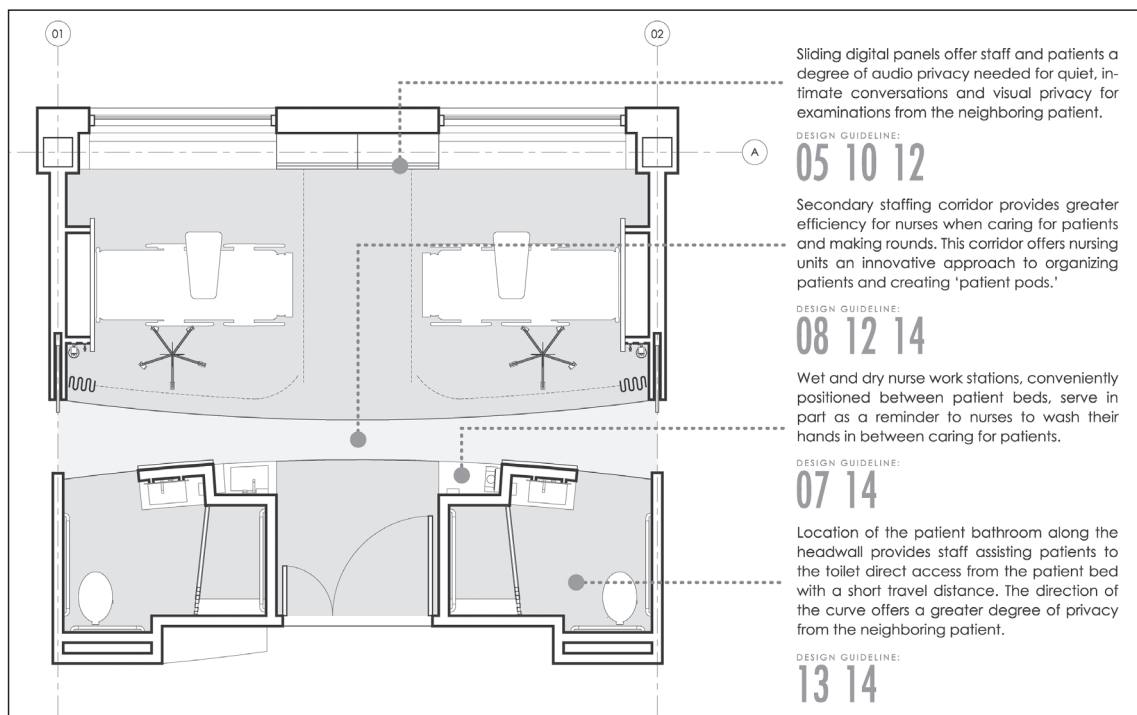
From the staff person’s perspective, the digital panel functions as an audiovisual screen that enables intimate conversations not to be overheard by others in the suite. The secondary staffing corridor affords direct access to patients, if their duties do not require recirculation into the public corridor while attending to them. “Wet” and “dry” nurses’ stations are provided in each suite,



**Figure 3.** Reconfiguration (R1): Assessment of patient amenities.



**Figure 4.** R2: Assessment of family/visitor amenities.



**Figure 5.** R3: Assessment of staff amenities.

conveniently positioned between beds; these serve to prompt staff to wash their hands frequently. The location of the bathroom on the inboard side affords a short travel distance from the bed. A slightly bowed, coordinated inner wall, floor pattern, and ceiling soffit reinforce both the functional (spatial) and visual-ambient (perceptual) autonomy of each patient (Figure 5).

### Summary—The Case for Evidence-Based Research on Hybrid Typologies

The reconfigured inpatient care unit in the case study reported above addresses, by and large, infection control, patient acoustical autonomy, visual privacy, socialization, and the overall propensity of some types of patients to be

more suitable, that is, predisposed, to achieve the maximum benefits of a semiprivate room. Because an existing inpatient unit served as the platform for this investigation, no significant reductions in total bed count or in nursing walking distances were anticipated. Similarly, no significant cost savings in facility management operations were anticipated. This study demonstrates that it is possible to attain a reasonable hybridism without compromising the experience of being hospitalized—a balance similar to that being attained in recently built hospitals elsewhere in the world, but not in the United States at this time. This hybridism has a direct bearing on the following three aspects of American hospitalization:

### Adverse Medical Events

Medical errors, a leading cause of death and injury, continue to be a serious problem in U.S. hospitals, whether the patient is housed in a private room or otherwise (Grady, 2010; Stelfox, Bates, & Redelmeier, 2003). Approximately 98,000 people continue to die in any given year from medical errors, including hospital-acquired infection, exceeding the number attributable to motor vehicle accidents (43,458), breast cancer (42,297) or the 16,516 who died from AIDS (Kohn, Corrigan, & Donaldson, 2000; Morrissey, 2003). The associated costs of such mistakes continue to escalate, irrespective of patient room typologies (Scott, 2009). Factors such as staff stress, exhaustion, long shifts, excessive noise, poor lighting, and dysfunctional furnishings and equipment continue to have a great influence on the frequency of medical errors, across the board (Chaudhury, Mahmud, & Valente, 2006). Proponents of all-private configurations widely claim that these conditions reduce the occurrence of medical errors because they eliminate potential confusion among patients with respect to their charts, medications, and dietary restrictions. However, a recent review of this literature revealed that “further studies and demonstration projects are needed to ascertain the safety advantages” of the private patient room model (Ulrich, Zimring, Quan, Joseph, & Choudhary, 2008, p. 79).

In general, nurses today care for more patients at average higher acuity levels than in the past. The more time nurses spend moving between patients in all-private configurations, the less time and en-

ergy they may have to dedicate to bedside care for any given patient. Second, the nursing profession itself is aging, averaging 43 years of age (Ulrich et al., 2004). Third, in recently built all-private-room U.S. hospitals, anecdotal evidence suggests that the design goal of decentralizing the traditional central nurses’ station into satellite care stations adjacent to a pair of private rooms has resulted, in some cases, in higher demands on an already overburdened nursing profession by increasing care task time per patient from the effort expended walking to and from the *satellite* to the central nurses’ station *mothership*. This is a particular problem when patients on a nurse’s shift are two or more rooms apart, with one or more rooms between the occupied rooms.

Patient falls are often associated with the dosage and type of medication a patient is receiving. They can also be caused by patients stumbling between bed and bathroom, either when alone or when assisted by a family member or staff person (Ulrich et al., 2008). Such adverse events, even in cases of direct staff involvement in the accident, occur on a daily basis irrespective of room type. Environmental distractions, and the potential to mistake patients for one another, may be primary antecedents whether one is housed in a private room or otherwise. Another claim by all-private-room advocates has been that patient medications can be easily confused between patients in semiprivate rooms. Yet by 2010, the majority of U.S. hospitals had implemented electronic record data management protocols and bar coding for patient dosage identification as the new standard for medication distribution systems (Phelps Centre, 2007).

This case study directly addressed the centrality and primacy of effective hand washing. To date, semiprivatism has not been linked conclusively with higher infection rates relative to hand-washing protocols. The inclusion of in-room hand-washing sinks and their proper location has been found to significantly reduce infection rates (Van de Glind et al., 2007). One study comparing an intensive care unit converted from an open unit with few sinks to all-private rooms with one sink per room found that hand washing did not significantly increase (from 16% to 30%), yet no decline in the incidence of infection occurred (Ulrich et al., 2008). It was concluded that “these results are perhaps explainable by the fact that several sinks in the single-bed unit were placed in comparatively inaccessible or inconvenient locations further supporting the belief that the methodical placement of staff handwashing sinks is of utmost importance.” At the aforementioned Martini Hospital in Groningen, The Netherlands, the location of the hand-washing station in the semiprivate rooms is accented in bold colors to set it apart from its surroundings within the room. In any type of inpatient room, private or otherwise, the hand sanitation station must be accessible, convenient, and a reminder to wash one’s hands between caring for each patient.

#### *Socio-Cultural Benefits*

The case study directly addressed the sociocultural benefits of semiprivatism. The social capital accruable between patients with compatible conditions in a semiprivate room cannot be underestimated or dismissed. Patients and their families in health-care settings can benefit from human interaction

and the bonds established (Verderber, 2005). The socialization accrued by sharing a room might be dismissed as unimportant to patient healing and recovery, yet anecdotal as well as empirical evidence suggests otherwise. A recent study in New Zealand with adolescent patients ranging from 16 to 21 years of age presented the positive aspects of sharing a room, as reported by patients and family members. Their satisfactions arose from a sense of shared purpose derived through discussions with their care providers and companionship in an otherwise lonely, isolating environment (Malcolm, 2005).

As previously mentioned, patient populations well suited for semi-privatism include but are not limited to rehabilitation patients, pediatric patients, and organ-transplant patients. These populations potentially share a desire for socialization and emotional support. They also typically experience longer lengths of stay, possibly contributing to a greater sense of isolation. Adolescents, usually more uninhibited than adults, might also prove to be an appropriate cohort in terms of the socialization and support accruable from sharing a room with another patient of approximately the same age and experiencing similar circumstances. In a study conducted among adolescent patients ranging in age from 12 to 21, Miller, Friedman, and Coupey (1998) found that adolescents were roughly divided between preferring a room alone (40% of patients interviewed) versus a room with one other patient (39%).

Conceptualizations of privacy vary significantly between individuals and across cultures (Kaya &

Weber, 2003; Newell, 1998). In Germany, semi-privatism remains the norm in recent hospital construction, as evidenced in the recently opened University Medical Center in Hamburg-Eppendorf (Gastmeier, Daschnert, & Ruden, 1999; Nickl-Weller & Nickl, 2009).

Privacy consists of far more than a mere state of physical isolation (Dowdeswell, Erskine, & Heasman, 2004; Newell, 1998). In traditional semi-private rooms, where two (or three) beds are positioned side by side on one or both sides of a single room, a thin, so-called *privacy curtain* is drawn around each patient's bed. However, such measures possess multiple deficiencies (Barlas, Sama, Ward, & Dresser, 2001; Pease & Finlay, 2002). In contrast, the incorporation of innovative technologies, such as focused sound baffles, bedside speakers, and the acoustical panels featured in the case study can provide a viable, more private yet cost-effective alternative.

Directed, personalized sound technologies now make it possible for others nearby to hear virtually nothing within a semiprivate inpatient room (Schirmer & Meuser, 2006). This technology is particularly useful with regard to television viewing, online activity, and conversations with caregivers. The aforementioned HIPAA has further elevated the importance of having reasonable safeguards in place to protect the confidentiality of staff conversations with and about patients. It is entirely possible that patients who share a poorly designed semiprivate room may opt to avoid, or incompletely answer, questions related to sensitive matters. This risks misdiagnosis, a truncated

exchange with one's caregivers, or poorly conveyed care options (Tarkan, 2008).

*Carbon Neutrality, Hybridism, and Retrofitting*  
Healthcare facilities, although representing only 3% of total commercial square footage constructed in the United States in 2008, represented 11% of all energy consumed, ranking fourth highest among all types of buildings (Campbell, 2009). The demands hospitals place on the planet are more intense than virtually any other building type because they must remain operational on a 24/7 basis and they are highly resource-intensive in terms of water consumption, aggregate chemical consumption levels, and infection control requirements (Berry et al., 2000; Cahnman, 2006a, 2006b). The case study demonstrates how it can be prudent to renovate/retrofit an existing facility to achieve inpatient room type variability rather than build a new one. By contrast, a newly built all-private-room patient tower may over-extend a hospital's already disproportionate environmental footprint (Yee, 2008). In total replacement facilities, the old hospital left behind is likely to become orphaned, as will be the case with the replacement facility for New Orleans' Charity Hospital, projected to open in 2014 (Verderber, 2008, 2010b).

### **Conclusion**

The semiprivate inpatient room cannot justifiably be singled out as solely responsible for increased hospital-acquired infection rates, although its legion of critics appears to claim otherwise. In reality, evidence-based empirical research exclu-

sively linking infection control and the number of beds in a room remains limited and inconclusive (Chang & Nelson, 2000; Coopersmith et al., 2004). Healthcare facilities across The Netherlands are achieving infection control rates lower than those in the United States, while primarily caring for the majority of their inpatients in multibed rooms.

In conclusion, evidence-based research is needed to examine the return on investment of the all-private-room hospitals built in the past decade across the United States. Healthcare administrators, direct care providers, architects, engineers, and a host of allied professionals are in need of more conclusive data. This subject is timely and of obvious interest to many at this time. The continued benefits of socialization and nursing care delivery associated with well-designed semiprivate rooms, together with hygienic best practices on the part of staff, call for further study. This is particularly so in light of the continued need to minimize adverse medical events and to seek new ways to control escalating hospital capital improvement costs.

For decades, hospitals overseas have looked to the American healthcare system for innovation. It is ironic that the all-private-room template is currently being exported (prematurely) internationally without adequate research to determine its true effectiveness within the United States. This is unfortunate, because the all-private-room facility template is becoming a cornerstone of many hospitals' public relations and marketing efforts (Anon, 2011).

Simultaneously, a parallel re-examination is warranted at this time with respect to the underlying rationale behind always building new versus exploring the option of renovation as a means to achieve an optimal mix of patient privacy with semiprivatization. This conundrum further suggests that focused evidence-based design research is needed before absolute conclusions can be drawn. The future design of inpatient rooms, whether private or semiprivate, together with advances in technology, care delivery protocols, and institutional policies must be orchestrated together. This will significantly reduce medical errors and infection rates in hospitals while simultaneously optimizing the overall inpatient care experience.

### Notes

1. This research was made possible by support provided to the first author through the AIA/AAH Arthur N. Tuttle Graduate Fellowship in Health Facility Planning and Design in 2009–2010. The work constituted part of the requirements for the MArch degree in the Graduate Program in Architecture + Health at Clemson University.
2. As part of the POE protocol, a number of hospitals with semiprivate inpatient rooms were documented. These were located in London and in Deventer and Groningen in The Netherlands. The first author visited and documented these hospitals in the summer of 2009. A detailed spatial and visual analysis of each was conducted. An initial assumption was that not all patient populations would be equally appropriate for sharing a patient room. Patient populations were evaluated based upon a predetermined set of metrics: acuity, diagnosis, and ALOS.

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