

Presentation on the  
Guidelines for the Design and Construction of  
Hospitals and Health Care Facilities  
For  
Kentucky AIA

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## Background Information:

The American Institute of Architects (AIA) and the Facility Guidelines Institute have begun the process of revising the 2001 edition of the *Guidelines for Design and Construction of Hospital and Health Care Facilities*. The document is widely used by architects, engineers and health care professionals as a guideline, reference, or code.

“We invite all experts to take this opportunity to implement your vision for the future of health care design,” said Joseph G. Sprague, FAIA, chairman of the Guidelines Revision Committee. “If you have concerns about specific aspects of the design and construction of hospitals, nursing and other long-term care facilities, outpatient facilities, rehabilitation facilities, and psychiatric hospitals, now is the time to let them be known,” Sprague said.

All interested parties are invited to submit proposed revisions and/or additions to update the existing *Guidelines*, which are revised every four years to keep pace with new concepts and capabilities in the delivery of health care. The proposal has already concluded and the Health Guidelines Revision Task Force has met to develop a shaded text version of the 2006 edition of the Guidelines. It is anticipated that the shaded text version will be available to the general public on November 1, 2004 with an opportunity to provide comments back to the HGRC during the public comment period until January 31, 2005. The new edition is anticipated to be available to the public in January of 2006.

At present, more than 40 states and the Joint Commission on Accreditation of Healthcare Organizations reference the *Guidelines* for licensure or accreditation of health care facilities. In addition, the federal government will continue to reference the *Guidelines* in regulating HUD 242 loan guarantee programs and Department of Health and Human Services medical facilities.

The *Guidelines* recommend minimum program, space, and equipment needs for all clinical and support areas of hospitals, nursing facilities, freestanding psychiatric facilities, outpatient and rehabilitation facilities, and long-term care facilities. The document also addresses minimum engineering design criteria for plumbing, medical, gas, electrical, heating, ventilating, and air conditioning systems.

Aspects to be given particular consideration in this review process follow:

- Therapeutic environments (environment of care, green design and sustainability)
- IT and health care technology and communications (includes patient documentation, imaging)
- Infection control (includes biohazard control, handwashing, infection control risk assessments, construction materials)
- Disaster planning
- Safety and security
- Dimensional consideration (includes space planning, costs)
- Energy and cost-effectiveness

Workgroups were assigned to review and develop proposals for the following areas:

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General Considerations

- Disaster planning
- Energy/LEED issues
- HIPAA vs. Guidelines
- ICRA
- Therapeutic environments
- Water systems design
- Glossary
- Anterooms for Isolation Rooms
- Ceilings and surfaces (in ORs, etc.)
- Decontamination/critical access and freestanding ED
- Emerging technologies
- Endoscopy and lab ventilation
- Impact of increased family involvement
- NICU/nursery
- Pediatrics
- Radiologic vascular interventions
- Receiving/waste and materials management
- Size/clearance in ICU/CCU/NICU and ED
- Staff accommodations/support facilities
- Variable acuity
- Ventilation
- Inpatient primary care facilities

Nursing Facilities

- Single-room occupancy
- Resident room windows
- Resident room furnishings
- Subacute care facilities
- Air changes in resident care areas

Ambulatory/Outpatient Facilities

- Mechanical standards
- Endoscopy suites
- NYS Construction Standards Advisory Group proposals
- Office surgery (NEW 9.11)
- PACU requirements
- Storage dimensions (9.5.F5.h)

Other Special Workgroups

- Psychiatric hospitals
- Hospice
- Assisted living
- Adult day care

## Major Areas Under Revision

### **Single vs. Semiprivate Room**

#### **Key Findings:**

Private rooms are the trend in hospital planning and design. The advantages of single-occupancy rooms are cited as improvements in patient care, a reduction in the risk of cross infection, and greater flexibility in operation. However, it is important to view and interpret the benefits of single-occupancy rooms within the context of patient care issues, other environmental changes and management policy changes in order to bring about desired and sustainable outcomes.

#### First and operating costs

- Literature focusing on comparative first costs for single and multi-occupancy rooms is scarce. The limited number of articles exploring the relationship between first costs and operating costs indicates that operating costs are proportionately more than the capital cost of hospitals, and this is true even for cost estimates within the first three years of construction.
- Operating costs are reduced in single patient rooms compared with multi-occupancy rooms due to reduction in transfer cost, higher bed occupancy rates and reduction in labor cost. However, this cost reduction can be better achieved when conversion to single room is paired with other healing environment design principles. Cost savings because of reduction in transfers is particularly applicable with acuity-adaptable rooms (Hill-Rom, 2002; Ulrich, 2003).
- Even with higher first or unit costs of construction, furniture, maintenance, housekeeping, energy (e.g., heating and ventilation) and nursing, single occupancy can match the per diem cost of multi-bed rooms because of the higher occupancy rates (Bobrow & Thomas, 2000; Delon & Smalley, 1970).
- A patient’s length of stay is associated with hospital costs. Research demonstrates that patients’ length of stay in private rooms is shorter, which in turn reduces costs (Anonymous, 2000; Hill-Rom, 2002).
- In comparison to multi-occupancy rooms, medication errors are reduced in single-occupancy rooms, resulting in reduced costs (Anonymous, 2000; Bilchik, 2002; Bobrow & Thomas, 2000; Hill-Rom, 2002; Morrissey, 1994).

#### Infection Control and Falls Prevention

- Infected patients or patients highly susceptible to infections need to be isolated in private rooms with proper ventilation systems and barrier protections in order to stop infection from spreading or to reduce the possibility of development of new infections. (Anderson et al., 1985; Muto et al. 2000; O’Connell & Humphreys, 2000; Schulster & Chinn, 2003).
- Prolonged hospitalization is a risk factor for hospital-acquired infections. Additionally, intra-hospital spread of infection may result from patients being transferred to more than one ICU or more than one floor during their hospitalization.

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- Patients length of stay in hospitals and cost is increased due to nosocomial infection (Zhan & Miller, 2003; Press Ganey Associates, 2003; Pittet, Tarara & Wenzel, 1994). Ongoing research is demonstrating that nosocomial infection rates are low in private rooms with proper design and ventilation systems (The Center for Health Design, 2003).
- Caution must be used when interpreting results from infection control literature, because the findings and recommendations are often based on retrospective investigations of infection outbreaks in particular settings and are tailored towards those settings. They may or may not be applicable to other settings.

### Patient Falls

- Patients who require constant supervision (as in the case of frail and/or delirious patients) are more likely to fall in hospitals; multi-occupancy patient rooms with increased surveillance may be more appropriate for these patients (Jones & Simpson, 1991; Sutton, 1994; Tutuarima et al., 1997).
- Most falls occur in patient rooms, among elderly patients, and when patients are alone or while attempting to go to the bathroom. (Hendrich et al., 1995; Langer, 1996; Pullen, Heikaus, & Fusgen, 1999). However, if provision is made for family members in patient rooms, falls may be reduced due to assistance from family. It is easier to accommodate family in private rooms than in semi-private rooms (Ulrich, 2003).
- Mixed results were obtained in studies and surveys of patients’ preferences for room design. The majority of patients prefer single rooms because of greater privacy, reduced noise, reduced embarrassment, improved quality of sleep, opportunity for family members to stay, and avoidance of upsetting other patients (Douglas, Steele, Todd, & Douglas, 2002; Kirk, 2002; Pease & Finlay, 2002; Reed & Feeley, 1973).
- Single-occupancy rooms increase patients’ privacy, which provides patients with control over personal information, an opportunity to rest, and an opportunity to discuss their needs with family members and friends. The number of patients in a room, the presence of visual screening devices, the location of the bathroom, and the placement of the patient’s bed all impact privacy (Bobrow & Thomas, 1994; Burden, 1998; Morgan & Stewart, 1999).
- The influence of room occupancy on type of pain medication usage is mixed. Some researchers discovered that patients in private rooms were more likely to use narcotics than were similar patients in semi-private rooms. This may be due to decreased environmental stimuli in private rooms. Whereas, others have demonstrated that pain medication intake is less in single occupancy rooms. (Dolce et al., 1985; Lawson & Phiri, 2000).
- It is claimed that health care professionals have more private, and in many cases, more thorough consultation with patients in single rooms than with patients in multi-occupancy units (Ulrich, 2003). Research in this area of patient confidentiality and patient consultation is limited.
- Patient stress can be reduced if preoperative patients are assigned to rooms with postoperative or non-surgical patients (Kulik, Moore, & Mahler, 1993). Multiple

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- occupancy rooms are associated with lack of privacy, higher noise level and sleep disturbance (Hilton, 1985, Ulrich, 2003).
- *Universal rooms* or *acuity adaptable rooms* are a current trend in design, especially in hospitals that are promoting patient-centered care and family participation in the patient’s healing program. These rooms are all private rooms. Results from a limited number of studies have indicated that medication errors, patient falls and procedural problems may be reduced in acuity adaptable rooms (Bobrow & Thomas, 2000; Gallant & Lanning, 2001; Hill-Rom, 2002; Spear, 1997). However, these results may be specific to the particular institutions studied. More detailed study with examples from multiple hospitals is required before drawing specific conclusions.
  - Sources of stress for patients are: perceived lack of control, lack of privacy, noise, and crowding (Shumaker & Pequegnat, 1989). Excess noise can lead to increased anxiety and pain perception, loss of sleep, and prolonged convalescence (Baker, Garvin, Kennedy, & Polivka, 1993; Cys, 1999; Hilton, 1985). Single rooms often afford more privacy, reduction of noise and less crowding. Control is greater in private rooms, as patients can adjust settings according to their needs (Shumaker & Reizensten, 1982).
  - Music can also help reduce patients’ stress. Patients can listen to music in private rooms without disturbing their roommates (Cabrera & Lee, 2000).
  - Crowding can contribute to higher blood pressure. The use of private rooms often minimizes the patients’ sense of crowding (Baum & Davis, 1980; D’Atri, 1975).

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- Single-occupancy rooms increase patients’ privacy, which provides patients with control over personal information, an opportunity to rest, and an opportunity to discuss their needs with family members and friends. The number of patients in a room, the presence of visual screening devices, the location of the bathroom, and the placement of the patient’s bed all impact privacy (Bobrow & Thomas, 1994; Burden, 1998; Morgan & Stewart, 1999).
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These key findings are summarized in Table 1:

Category	Room Occupancy	Issues & Findings
<u>COST</u>	Single-Occupancy Room	<ul style="list-style-type: none"> <li>▪ Operating costs ↓</li> <li>▪ First costs ↑</li> <li>▪ Occupancy rates ↑</li> <li>▪ Length of stay ↓</li> <li>▪ Medication errors &amp; costs ↓</li> </ul>
	Multi-Occupancy Room	<ul style="list-style-type: none"> <li>▪ Operating costs (inconclusive)</li> <li>▪ First costs ↓</li> <li>▪ Occupancy rates ↓</li> <li>▪ Length of stay ↑</li> <li>▪ Medication errors &amp; costs ↑</li> </ul>
<u>INFECTION CONTROL AND FALLS</u>	Single-Occupancy Room	<ul style="list-style-type: none"> <li>▪ Rate of nosocomial infection ↓</li> <li>▪ Patient transfers ↓</li> <li>▪ Patient length of stay ↓</li> <li>▪ Infections in burn patients ↓</li> <li>▪ HCV transmission between patients ↓</li> <li>▪ Transmission of hospital-acquired diarrhea ↓</li> <li>▪ Falls in patients requiring supervision ↑</li> <li>▪ Falls in elderly when provisions are taken ↓</li> </ul>
	Multi-Occupancy Room	<ul style="list-style-type: none"> <li>▪ Isolation for infected patients (inconclusive)</li> <li>▪ Infections when patients are transferred ↑</li> <li>▪ Transmission of hospital-acquired diarrhea ↑</li> <li>▪ Patient length of stay ↑</li> <li>▪ Access to bathrooms ↓</li> <li>▪ Falls in patients requiring supervision ↓</li> <li>▪ Falls in elderly when provisions are taken ↓</li> </ul>

TABLE 1: Categories, issues, and findings related to single versus multiple occupancy patient rooms based on the literature review

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Category	Room Occupancy	Issues & Findings
<u>HOSPITAL DESIGN &amp; THERAPEUTIC IMPACTS</u>	Single-Occupancy Room	<ul style="list-style-type: none"> <li>▪ Privacy ↑</li> <li>▪ Pain medication (inconclusive)</li> <li>▪ Patient consultation with physician (inconclusive)</li> <li>▪ Patient preference for room design (inconclusive)</li> <li>▪ Noise level ↓</li> <li>▪ Sleep disturbances ↓</li> <li>▪ Acuity-Adaptable rooms (inconclusive)</li> <li>▪ Patient satisfaction ↑</li> <li>▪ Patient control ↑</li> <li>▪ Crowding ↑</li> <li>▪ Stress reduction through music ↑</li> </ul>
	Multi-Occupancy Room	<ul style="list-style-type: none"> <li>▪ Privacy ↓</li> <li>▪ Pain medication (inconclusive)</li> <li>▪ Patient consultation with physician (inconclusive)</li> <li>▪ Patient preference for room design (inconclusive)</li> <li>▪ Benefit of roommates (inconclusive)</li> <li>▪ Noise level ↑</li> <li>▪ Sleep disturbances ↑</li> <li>▪ Patient satisfaction ↓</li> <li>▪ Patient control ↓</li> <li>▪ Crowding ↑</li> <li>▪ Stress reduction through music ↓</li> </ul>

TABLE 1(Cont'd): Categories, issues, and findings in regards to single versus multiple patient rooms based on the literature review

## Inpatient Primary Care Facilities

The concept for an inpatient primary care facility is to provide maximum flexibility of primary care services at the community level. Many rural and urban communities located in designated underserved areas as defined by the Social Security Administration. These primary care facilities are intended to function as an affiliate or adjunct to existing hospitals. These primary care facilities are intended to provide a range of services not now available at the community level that can be supported through affiliation and service agreements with existing hospitals.

The small inpatient primary care facility is envisioned as a basic nursing unit that can service multiple patient population needs, tied to additional general services that can occur in a less restrictive outpatient settings. The patient rooms are intended to meet the criteria established for a standard two patient room and to provide sufficient support spaces and services to convert to universal rooms when necessary.

The following are examples of topics covered in the proposed new inpatient primary care facility guidelines.

### Nursing Units

A single nursing unit shall be provided for the primary inpatient facility. The unit shall be designed to accommodate multiple patient modalities, with adequate support spaces to accomplish the modalities referenced in the functional program. The number of patient rooms contained in the nursing unit shall be as determined by program, but shall not exceed 25 beds per unit; additional units may be incorporated into the design based on a demographic analysis and the facility's demonstrated ability to provide adequate support services for the additional beds.

Each nursing unit shall include the following:

- Patient Room
  - Each patient room shall meet Section 7.2.A. patient rooms and if the facility wishes to provide other inpatient overnight services they shall meet the following additional requirements:
- x.2.A1 The maximum room capacity shall be no more than two patient beds.
- x.2.A2 Patient rooms shall be designed to meet the most stringent nursing requirements articulated in the program narrative. A minimum of 200 square feet of clear floor area exclusive of toilet rooms, closets, wardrobes, alcoves, lockers, vestibules, or family sitting and sleeping areas, and staff service. The dimensions and arrangements of these rooms shall be such that there is a minimum of 5'0" clear between the sides and foot of the bed and any wall or any other fixed obstruction.
- x.2.A3 Each patient room shall have a window in accordance with Section x.28.A10.
- x.2.A4. A hand washing station for the exclusive use of the staff shall be provided to serve each patient room and shall be placed outside of the patient toilet.

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- x.2.A5. A patient toilet room shall be provided and shall contain a water closet, hand washing station, and shower. The door to the patient toilet shall swing outward or be double acting. The patient toilet room shall be placed in-board and shall be used to provide an entry alcove where a staff work counter, hand washing sink, and storage for gowns and isolation supplies shall be provided in the event the patient in the room is suspected of or receives a diagnosis requiring air borne or contact isolation, and special room pressurization.
- x.2.A6 Each patient shall have within his or her room a separate wardrobe, locker, or closet suitable for hanging full length garments and for storing personal effects.
- x.2.A7 Visual privacy from casual observation by other patients and visitors shall be provided. Design for privacy shall not restrict patient access to all areas of the room.
- x.2.A8. Areas for overnight stay for patient=s significant other or for the patient=s selected family care-giver shall be provided. Adequate spaces for sitting, lounging, and visiting shall be provided and shall meet the needs outlined in the program narrative.
- x.2.A10. Pediatric patients utilizing these rooms may have two patients placed in these rooms provided the it is not counter indicated by clinical needs of the patients. In rooms where more than one pediatric patient is placed, family care features of this chapter shall not be implemented.

x.3. Airborne Infection Isolation Rooms

If the program narrative requires a dedicated airborne infection isolation room, it shall meet the criteria established in Section 7.2.C. of these guidelines.

x.4. Protective Environment Rooms

If the program narrative requires a protective environment room, it shall meet the criteria established in Section 7.2.D of these guidelines.

x.5. Seclusion Rooms

If the program narrative requires a seclusion room, it shall meet the criteria established in Section 11.2C of these guidelines.

x.6. Critical Care

The patient rooms described in this Section shall have the capability of serving as temporary critical care patient rooms in the eventuality that a patient presents itself to the facility in need of stabilization and monitoring prior to being transferred to a hospital with an intensive care unit. These rooms are intended for temporary care of patients needing transportation to an intensive care setting in a higher level facility, not for active critical care treatment. These rooms should also serve the needs of patients requiring hospice and ventilator care.

x.7. Labor Delivery Post Partum Care

The patient rooms described in this Section shall have the capability of serving as LDRP rooms in the eventuality that a patient presents itself to the facility in need of such

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services after which arrangements for the transfer of patients to a hospital with maternity programs shall be made. The second patient station in the room shall have electrical, medical gasses and vacuum services to accommodate infant resuscitation needs.

x.7.A. Support Spaces for LDR Functions

If LDR/LDRP functions are programmed for these facilities, a storage area with a minimum of 100 square feet per LDR bed shall be provided for the storage of case carts, delivery equipment, and bassinets.

x.9.F. Surgical Facilities

Surgical facilities for the Small Inpatient Primary Care Center shall meet the criteria established for Outpatient Surgical Facilities Sections 9.5.E through L. The type of surgical procedures that are to occur in these facilities shall be limited to those that can be performed and supported under an ambulatory surgical setting. Such facilities shall meet all criteria established under Chapter 20 of the 2000 Edition of the Life Safety Code, NFPA 101.

x.9.G. Emergency Facilities

Emergency facilities for the Small Inpatient Primary Care Center shall meet the criteria established for Freestanding Emergency Facilities Sections 9.6.A through L.

x.9.G1 Helicopter and Ambulance Services

Helicopter and ambulance services must be provided as required by the narrative program to ensure the timely transfer of patients presenting to the emergency room to a hospital. The helicopter pad and ambulance ports must be within close proximity of the emergency suite and the designated patient rooms holding patients requiring transfer to a hospital for treatment after stabilization.

Conclusion

These are only two of hundreds of proposed changes to the 2006 edition. As these Guidelines are referenced by many state and national organizations it is highly recommended those professionals involved with the planning, design, operation, and construction of health care facilities become involved with the development process by reviewing the proposed new “shaded text” version available in early November 04.