

# INNOVATION IN HEALTH CARE DESIGN EVIDENCE-BASED DESIGN

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The health care environment has an impact on clinical and patient outcomes, financial and economic measure, individual and organizational productivity, satisfaction, philanthropy, and building performance. In this environment where life-changing activities are ongoing, we find the opportunity for in-depth study to advance the cause for research and for innovation, while improving patient outcomes via a healing environment.

The last decade has seen the advent of evidence-based design, the transition from the "art" of architecture and design to the "science" of health care design. Just as medicine has increasingly moved towards evidence-based medicine where clinical choices are informed by research, health care design is increasingly guided by rigorous research linking the physical environment of hospitals to patient and staff outcomes. Leading the way in this new era of research is the Center for Health Design, an organization bringing together leaders in the health care and design industries. Working together, these clinical, technical and aesthetic forces are conducting scientific studies to understand and support the impact of facility design on patient outcomes, experience of staff and organizational performance.

With billions of dollars of spending anticipated in health care construction both nationally and internationally before 2020, it is imperative a means to improve the health care environment be explored to support optimal work, healing, business and cultural outcomes. This building boom is fueled by aging baby boomers, new technologies, population shifts and the need to remodel or replace aging facilities. Important goals in this research and design process include creating healing environments for patients; family-centered designs to support family involvement in care; hospitable environments to reduce fear and anxiety, wayfinding systems to enhance patients' and families' ability to navigate independently within hospitals;

and a variety of design features in patients rooms, nursing stations, and patient care units to improve safety, prevent the transmission of infections, reduce patient falls and enhance patient visibility.

In a rigorous and far reaching study (Ulrich & Zimring, 2004) to evaluate existing research, teams from Texas A&M University and Georgia Tech found scientific studies that link the physical environment to patient and staff outcomes in four areas: 1) reduce staff stress and fatigue and increase effectiveness in delivering care, 2) improve patient safety, 3) reduce stress and improve outcomes and 4) improve overall health care quality.

One of the more compelling conclusions in this study is the pattern of evidence supporting the advantages of the single-bed patient room concept. From the four-bed "wards" of long ago, to the two-bed "semi-private" patient rooms still in many hospitals today, we now have research to support what every patient desires, the private patient room. Based on this large and varied body of research, there can be no question that single-bed rooms have major advantages over double rooms. These advantages include lower nosocomial (hospital acquired) infection rates, fewer patient transfers and associated medical errors, far less noise, much better patient privacy and confidentiality, better communication from staff to patients and from patients to staff, superior accommodation of family and consistently higher satisfaction with overall quality of care.

Since opening a new inpatient pavilion in 2000 with all private rooms, one Midwest hospital has seen overall patient satisfaction increased to 96.7 percent. Private patient rooms have resulted in: a) decreased patient transfers because of the elimination of conflicts among patients that necessitated moves and b) an increase in patient sleep quality. Further, private rooms, location of sinks,



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and airflow design have resulted in an 11 percent decline in overall nosocomial infection rates. Employee satisfaction has increased and nursing turnover rates are down to 4.7 percent. Market share has increased. And overall, the private patient rooms made for a better patient experience, and that enables higher quality of patient care.

In support of such research results, the 2006 Edition of the “Guidelines for Design and Construction of Health Care Facilities” published by The Facility Guidelines Institute, The American Institute of Architects Academy of Architecture for Health, with assistance from the U.S. Department of Health and Human Services, recommends private patient rooms in all new hospital construction projects. Two-bed rooms are allowed only when necessitated by the functional program. (Note: The Indiana State Department of Health, the licensing agency for Indiana hospitals, has not yet adopted the 2006 Guidelines.)

Additional research findings point out several other improvements for consideration and implementation. Reduce noise levels in hospitals by installing high-performance sound-absorbing ceilings and eliminating unnecessary paging and announcements. Provide patients with stress-reducing views of nature and other positive distractions. Develop wayfinding systems that allows users, particularly outpatients and visitors, to find their way efficiently and with little stress. Improve ventilation through the use of enhanced air filtering systems. Design patient care units and staff work stations to reduce staff walking and fatigue, increase patient care time, and support staff activities such as medication supply, communication, charting and respite from stress.

Evidence-based design is not about hospitals that are simply nicer or have more amenities than traditional hospitals. Rather, the focus of evidence-based design is to create hospitals that are safer while helping patients recover, and help staff accomplish their jobs better. It is a process for creating health care facilities based on the best available evidence that demonstrates how the physical environment can interfere

with or support activities by patients, families and staff, and how this environment provides experiences that are caring, effective, safe and patient-centered. ■

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