

Innovation in the Design of the ICU

New trends that incorporate patient and family-centered design

By Alex Stark

Patient-centered design has become the hallmark of most new construction in the health care field. This follows research that indicates that improved design can have a significant and positive impact not only on the outcome of the health care intervention, but on the bottom line as well (Roger Ulrich, *Healing by Design*, McGill University 2000). Patients and their families, fur-

thermore, are asking for user-friendly environments that have a more natural feel and look. Consequently, improved décor, more privacy, reduced environmental stressors, natural surroundings, and greater patient control over tasks and information are becoming commonplace. Older hospitals are feeling this pressure as new facilities market their user-friendly environments to a responding public.

New approaches to design

As a feng shui consultant specializing in the health care field, I am often asked to bring a more nature-conscious and patient-centered perspective into the design process. In fact, the very inclusion of my discipline attests to the current effort to widen the scope of discussion in the planning of new facilities. Often the planning team will include, in addition to the traditional medical, nursing, management, and technology staff, community advocates, patients, their families, and non-medical personnel (religious, clerical, custodial, etc). Interdisciplinary focus groups, community outreach, role playing, and mock design sessions are part of the new designer's approach.

Nevertheless, concerns still linger over the priorities questioned by these new demands. Nowhere is this process more evident than in the design of the Intensive Care Unit. Here the demands of advanced technology come head to head with the need to care for not only the patient, but the patient's family as well. On the one hand the severity of the interventions require the utmost in technology, methodology, and sterility. Patients and their families, on the other hand, are experiencing some of the most traumatic moments of their lives.

Patient's Concerns

ICU patients and family focus groups often complain about overwhelming feelings of insecurity, disorientation, anxiety,

Every room in the Bellevue Hospital ICU in New York is capable of adjusting to variable acuity modes. The medical team can also flex into these patterns, allowing the patient to remain with one team for the duration of stay.



fear and anger (Kirk Hamilton, "Impact of the ICU 2010 Report", in *Design & Health*, International Academy of Design & Health, 2003). The sheer volume of technology, the unfamiliar, sterile surroundings, lack of privacy, constantly revolving medical teams, incessant noise and glaring light, and the lack of natural forms, materials, and sensory experiences all add to this traumatic experience. As a result, the patients feel trapped in an environment they dislike and cannot control, and their families feel helpless. In addition, the ICU patient is often predisposed to cognitive impairments due to their stressed conditions, psychoactive medications, and physical trauma. The result is often dementia. A study at the Yale School of Medicine estimates that between 50% and 80% of older patients suffer dementia in the ICU (Pisani, Margaret, *Cognitive Impairment in the Intensive Care Unit*, Yale, 2003).

Design Strategies

Many of the family's concerns can be readily addressed by allowing the family to enjoy greater interaction with the patient and the ward. Waiting rooms in

many new facilities now include sleeping accommodations, lockers, private phone and internet booths, playrooms for children, kitchen and pantry facilities, soothing music, and even fish tanks, water falls and nature views. In some cases, overnight stays in the ICU room are encouraged, particularly in pediatric facilities. Many designers now allocate a zone within the ICU room for this purpose. At the Woodwinds Health Campus in St. Paul, for example, the zone closest to the window is the family's domain and can include a sleeper sofa. A similar arrangement is used at Clarian Methodist Hospital in Indianapolis.

Providing familiarity is another important concern. Designers are taking cues from the hospitality industry and creating hospitals that feel much more like traditional homes. At Woodwinds and at Clarian Methodist, for example, a TV, VCR, and CD player are all standard in the room, as is a special tack board for cards and notes in the step-down units. A small shelf near the bed serves to hold personal items. Adjustable light dimmers can be controlled by a family member. At Woodwinds a sliding wall panel, finished

in natural wood veneer, allows for the headwall delivery system to be concealed if the situation permits.

Despite the need for round-the-clock nursing supervision and for visibility through glass walls or large corridor windows, patient's privacy can be enhanced by providing adjustable curtains and blinds. Low glare glass, furthermore, is helpful in controlling night-time reflections within the room.

Need for a more natural environment

Research demonstrates that views of nature are important in the health care setting: patients who enjoy views of nature heal faster than control groups that look onto blank walls (Claire Cooper Marcus, *Healing Gardens*, John Wiley & Sons, 1999 and Ulrich, 2000). Although codes now require windows in all ICU rooms, the view from these rooms should include greenery and more distant vistas. In some cases, landscapes and nature photography can be introduced within the room, not only as art on the walls, but also as part of the ceiling design and on fabrics.



The Woodwinds Health Campus in St. Paul offers ICU rooms with nature views, sleeper sofas, personalized decor and adjustable lighting and window treatments. Overhead paging has been eliminated and alarms are silent wherever possible. Waiting rooms include fireplaces, play rooms, private phones, kitchen and pantry facilities, and fish tanks.



Wall and furniture colors can also liven up otherwise sterile ICUs. Despite the need for seamless impermeable surfaces, advances in flooring materials now allow for more natural looking ICU floors and for finishes that reproduce natural wood, foliage, flowers, and even animals. In all situations a "horizon line" should be added to the room that subliminally mimics the natural horizon humans are accustomed to outdoors. This should be located at waist height and should extend around the whole room. It can be rendered through window sills, door mullions, counter tops, or wainscoting.

Other ways of making the ICU less stressful include controlling sound and light levels. Computerized monitoring equipment and the use of vibrating pagers and cell phones has made it possible to eliminate overhead voice pagers and some types of audible alarms. The modern ICU can now be a much quieter environment, allowing for better rest for the patient. Automated lighting controls make it possible to change the illumination patterns within the ward, mimicking the rhythms of day and night more effectively. In response to these trends, codes are also changing: permissible sound levels are lower than ever before and lighting regulations now reflect the cyclical rhythms of night and day.

Therapeutic elements in the ICU environment

The ICU environment should focus on these therapeutic elements:

- Windows and art that provide natural views; views of nature can reduce stress, hasten recovery, lower blood pressure and lower pain medication needs
- Family participation, including facilities for overnight stay and comfortable waiting rooms
- Providing familiarity in the ICU environment through personalization, warmer colors, natural materials, and artwork
- Providing a measure of privacy and personal control through adjustable lighting, adjustable curtains and blinds, accessible bed controls, and TV, VCR and CD players
- Noise reduction through computerized pagers and silent alarms
- Medical team continuity that allows one team to follow the patient through his or her entire stay

Changes in technology

Despite the need for a more patient centered approach, technology still rules most of the decisions made in ICU design and is the single most important consideration brought up by physicians and nurses when developing a design model. Ironically, as technology has progressed, greater versatility has also become possible, allowing for accommodation to some of the patient's most important concerns.

The drive towards centralized intensivists medicine, for example, has forced many larger hospitals to cluster previously separate ICUs into one larger ward. The financial savings in this approach are obvious. What is not as obvious is that by doing so, ICUs have had to blur the edges between

critical, acute, and step-down rooms. In fact, at a number of new facilities, the same room is now being adjusted to the level of care required by each patient. This reduces stress for the patient and can avoid costly transfers and census adjustments down the line. At Bellevue Hospital in New York city, for example, a brand new ICU now boasts of 55 patient rooms, all capable of instant flexing into any acuity mode. This has allowed the designers to justify sleepers and recliners for over-night visitors in all rooms.

A similar transformation has occurred in the composition of the care team. Since the room now functions at varying acuity levels, the patient no longer has to be moved as the acuity of their care fluctuates. This in itself greatly reduces

stress on the patient. In addition, the medical staff is now being cross-trained so that any given team can step into lesser or greater acuity mode. This has valuable patient and family appeal because the patient can be taken care of by a single team, whose members will follow the patient through all stages of their recovery, getting to know them and their families in the process. This effectively addresses one of ICU patient's most frustrating complaints: lack of familiarity and rapport with their constantly changing medical team.

The Future

As the debate over critical care continues to unfold, better medical care will undoubtedly be available to a more informed public. Part of this process will have to recognize the need for a more patient-centered and family-conscious approach that can take care of not only the physiological needs of the patients, but their psychological and spiritual needs as well. The ICU of the future promises to be a true place of healing in which all dimensions of the patient's needs will be met and in which advanced technology will accommodate the more subtle needs of the whole person.

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