



Environments for cancer care



The Nurture by Steelcase Healthcare Research Team shares the results of its recent studies in cancer care environments **BY MELANIE REDMAN, RITU BAJAJ, CAROLINE KELLY, AND DEBORAH HANDLER; IMAGES COURTESY OF NURTURE BY STEELCASE**

While a recent report by the American Cancer Society announced that the number of deaths due to cancer has declined overall since the 1990s, the number of consumers for oncology care is growing. Nearly 1.5 million new cancer cases are expected to be diagnosed in the United States in 2008, with one in two American men and one in three American women likely to develop the disease in their lifetime. About 77% of all cancers are diagnosed in persons 55 years and older. While these statistics can be frightening, the survival rates for most cancers continue to improve.¹

The fact that most cancer patients are older and are surviving longer means that there is a predicted increase in the demand for oncology care. A recent study anticipated that there will be an 81% increase in people living with or surviving cancer from 2000 to 2020. However, there will only be a 14% increase in the number of patient visits provided by oncologists over the same period. This predicted shortfall is because of the size of the Baby Boomer generation who will need care and the number of oncologists of that generation who are nearing retirement, as well as the limited number of oncology training



Figure 1. This lounge offers family and friends a place to relax, eat, or connect. It is adjacent to the treatment bays so family can “get away without going away.” Patients who feel well enough can join their families here during treatment. Sightlines between the open bays, the family lounge, and the nurses’ station support the connections between patient, family, and staff.

programs. The study predicts there will be 12,500 practicing oncologists in the United States in 2020. This would be a shortage of between 2,550 to 4,080 doctors.²

These shortfalls put additional pressure on healthcare facilities to distinguish themselves by providing outstanding care to attract patients, doctors, and nurses. We believe the physical environment plays an important part in this.

In 2006, the Nurture by Steelcase Healthcare Research Team was approached by a cancer and hematology center to help with the design of its new facility. The director wanted the new design to be based on a true understanding of the work processes and patients’ needs. The resulting insights and design principles are based on months of secondary and primary research involving nine different oncology facilities at five institutions and are intended to document the understandings gained through implementation of a user-centered research methodology.

Our team of four healthcare design researchers performed an initial round of secondary research before we began observations—focusing mainly on outpatient care, emphasizing radiation therapy and chemotherapy. Observations encompassed entry and check-in areas, waiting areas, exam rooms and treatment areas, and staff areas, including med prep, charting, and meeting spaces. We shadowed physicians,

nurses, ancillary staff, and patients, as well as observing the general activity within a space. We also conducted interviews and participatory design sessions with patients, staff and family members.

As part of the interviews, we asked patients and staff to complete an exercise in which they were asked to rank a list of needs based on Maslow’s Hierarchy. Patients were asked to rank the list in order of importance to themselves, while staff were asked to rank the same list, according to their *perception* of what patients considered important. This exercise allowed us to see disconnects between patients’ needs and staff’s awareness of those needs.

To prepare for the participatory design sessions, we selected a broad range of words and images mapped to a semantic differential scale. We gave all the participants the same set of images and words and asked them to create collages that expressed their initial experiences in their cancer centers, and then create new ones that represented the ideal they would like to have experienced. In addition, we asked them to listen to different selections of music, smell different scents, and choose from a palette of colors, to express the experience they wanted when visiting the cancer center. We found these sessions particularly rewarding, as the participants were extraordinarily eloquent in sharing their experiences and emotional needs.

Following the completion of the ob-

servations, the team synthesized all of the data collected from secondary and primary sources. Using the resulting design principles as guides, we held three design charrettes to explore product concepts and space applications, some of which resulted in the thought starters which are included in this article. We built full-scale models of some of these concepts and invited patients, oncologists, nurses, and a pharmacist to walk through and provide feedback.

Based on their comments, development continues on these and other product and environmental concepts and Nurture’s first pilot installation featuring components of this research is currently underway.

In the following section, we’ll discuss four of the 12 design principles we developed.

We are family

Design Principle: *Carepartners are integral to the healing process because they provide vital support to the patient. However, their comfort and needs are often overlooked, which can increase their stress, as well as the patient’s. Connecting carepartners to appropriate resources and support can help them cope with the disruption and strain caused by their loved one’s illness. Plan for the inclusion of family in the treatment area (figure 1), as well as dedicated spaces where they can relax, talk, or connect to the outside world (figure 2).*

During our observations, we were struck by the level of involvement by patients’ families and friends. Rarely did we see a patient arrive unaccompanied for treatment. We also observed, however, that these carepartners, though integral members of the care team, often had needs of their own that were unmet by cancer facilities.

As cancer treatment becomes more and more often an outpatient experience, we can expect these carepartners to play an even more important role as patients rely on their help for day-to-day care.

Our interviews with patients revealed the additional stress they experienced by worrying about the well-being of their families and friends. Removing this source of stress by taking care of the carepartners can not only enable them to provide better support to the patient, but can allow the patient to concentrate on healing.

Details, details

Design Principle: *Cancer treatment is an ar-*



Figure 2. The relaxing atmosphere of the Wellness Center reaches out to patients looking for something different from a healthcare facility. The piazza-like setting, with trees, benches, and a fountain, provides a comfortable place to wait, as well as a welcoming start to a treatment episode.



Figure 3. These Infusion Cubes are designed with two zones—one to provide nurses easy access to the patient, and the other for family to sit with their loved one comfortably without being in the way. The nurses have storage and work surfaces to complete drug preparation and do charting at the point of care.

duous experience, which can be made worse by annoyances such as inaccessible power outlets, distant toilets, and lack of personal storage. Staff struggles with inconveniently located waste receptacles and medication supplies. Consider how to provide simple conveniences to ease the strain on patients and staff.

Sometimes the simplest details can make a huge difference in the experiences of staff, patients and families. For example, work areas in chemotherapy (figure 3) need not only to support activities like charting; they need to be designed to accommodate the safety precautions necessary when working

with dangerous drugs. It has been shown that the cumulative inconvenience caused by things like the inappropriate placement of oxygen outlets, doors which are too small, a lack of electrical outlets and insufficient space in which to work, can lead nurses to leave a job.³

One oncology nurse described her workplace: “Every space is taken up by phones, computers, monitors, pagers, battery chargers, a hole punch. Add printers, fax machines, copiers, and Pyxis scanners for pharmacy... Everything is pretty well fractured as far as our space.”

This is a fairly common situation, especially in older facilities. The longer a treatment center has been open, the greater the likelihood of newer equipment and processes conflicting with the original design. This can impede staff from working efficiently, create a chaotic environment, and even lead to dangerous conditions.

Facilities sometimes seem to be designed without the physical realities of cancer treatment in mind. Patients have to get up frequently to use the restrooms because of the IV fluids they receive, as well as the side effects of nausea and vomiting. To counter these side effects, most chemotherapy patients need to drink large amounts of fluids and it is recommended they eat small, frequent meals, or snacks of dry toast or crackers. Unfortunately, bathrooms and food service are often far away or difficult to get to, especially when dragging along an IV pole.

The details that affect the staff also affect the patients, both directly and indirectly. Having to bend over and reach behind a treatment chair to unplug an infusion pump dozens of times a day so patients can go to the restroom can be draining for the staff. Poor placement of the outlets also means that patients cannot easily unplug themselves to get up. Inefficiencies cost everybody time and patience.

Convenient access to pillows and blankets can also be overlooked. Patients are often cold and many observation sites we visited were overly-air conditioned without local thermostat controls. Similarly, the lack of control over ambient light and sound are details that impact both comfort and function in a space.

Activities in treatment areas range from the actual care delivery by staff, to patients resting, reading, eating, or socializing. In radiation therapy areas, the detail of where gowned patients can wait with some comfort and dignity is often overlooked. Given that the majority of cancer patients are over 55 years of age, special attention may need to be paid to the issue of comfort and privacy. Several older women undergoing treatment complained to us that they felt uncomfortable sitting in their gowns in a waiting room with men who also wore only gowns.

Comfort and dignity can also be compromised when bariatric patients are not considered. Some A&D firms are now

This sheds light on the profound need that patients have to be seen as whole, thinking, individuals throughout their cancer experience.

specifying anywhere from 10 to 20% of waiting room seating as bariatric, but this may be inadequate because of the increasing bariatric population.

While accommodating the bariatric population is a newer trend, accommodating those with disabilities is supposed to be well established. However, providing adequate space to maneuver and to integrate wheelchairs or other aids into the care environment still proves to be a challenge. Even if patients aren't in wheelchairs, they may be weak or ill from the effects of treatment, so even a simple step up onto a scale can be difficult.

See me, heal me

Design Principle: *When programming drives the design of healthcare spaces, important relationships among staff, patients, and families can be overlooked. Boundaries can either enhance or detract from the perception of approachability between patients and staff, and can impact efficiency. Consider how allocating space and planning adjacencies will affect the interpersonal interactions necessary to cancer care.*

We came to understand that if oncology environments are thoughtfully designed, they can have a positive impact on the interpersonal interactions among patients, families, and staff. The elements of access and approachability are particularly important because they have an effect on staff efficiency, safety, patient satisfaction and the perception of the quality of care being delivered.

As in other healthcare spaces, the distance between treatment and support areas in oncology environments is an important component in the delivery of care. The amount of time spent walking by healthcare staff in order to care for their patients has been studied extensively.^{4,5} In chemotherapy care, nurses are constantly on the move. Inefficiencies can result from poor adjacencies; bottlenecks can occur at the handoff point between a pharmacy and nurses' station when there isn't enough space at a transaction counter or when the medications aren't organized and nurses have to search for their patients' drugs. Not only is efficiency compromised, but potentially safety, as well.

Most nurse work areas in our observations were designed as open plans that supported direct visual contact with the patients. However, one infusion center had a nurses' station which was a closed room without sightlines to the treatment area. Contrary to our expectations, these nurses claimed they did not feel their work was hindered by this design. In fact, they felt this provided them with space for work which requires concentration or privacy.

The inverse condition occurred in infusion areas with individual treatment rooms, where the nurses were in an open work station, but could not monitor their patients directly because of the private rooms. They had to circulate through the space each time they wanted to check on their patients. Some rooms were designed so the

treatment chair was oriented toward the door so the patient could be seen from the corridor. This may have eased things for the nurse, but left some patients feeling exposed to passersby.

Balancing access and privacy may be difficult to achieve. The types of connections between spaces, sightlines, and circulation patterns will facilitate or hinder work flow and relationships (figure 4). The thoughtful design of these spaces can help to build a community, not just a healthcare facility.

A holistic approach to care

Design Principle: *Providers need to remember that they are treating a person, not just a disease. Cancer treatment demands a holistic approach that supports the patient emotionally, as well as physically. Clinical care doesn't always address the fundamental human need for respect, dignity and security. Create spaces that allow staff and patients to integrate care for the mind, body, and spirit as they deal with this life-altering disease.*

While the physical burden of undergoing cancer treatment is great, the toll taken on the patient's spirit and emotions can be just as trying. Caregivers recognize the hardship and generally try to alleviate it through personal efforts. A holistic approach to care and the ways the built environment can support it can greatly ease that burden.

There is no doubt that cancer patients and their loved ones are under stress because of the presence of the disease itself. The stress that patients feel can be made worse by experiences they have while undergoing treatment. The theory of supportive design put forth by Roger S. Ulrich (1990) states that a person's stress level can be decreased when they are provided three things: a sense of control, social support, and exposure to positive distractions.

When things like privacy or modesty are not respected during treatment, a patient can experience the sense of loss of control. Think of a typical check-in and waiting area where personal health information (PHI) is often discussed with little visual or acoustical privacy.

During treatment itself, patients may feel physically compromised. During our observations, we saw patients who were sometimes required to wait in semipublic areas wearing little more than a hospital gown.

Chemotherapy is often delivered in a large open treatment room. For some, this provides a chance to socialize with other patients, which can be a stress reliever; for others, the prospect of being with others worsens the experience.

A choice of privacy level can provide a sense of control and help to support the variety of social interactions a patient may desire. Providing space and comfortable furnishings for family members at the infusion chair allows for companionship, as well as learning opportunities.

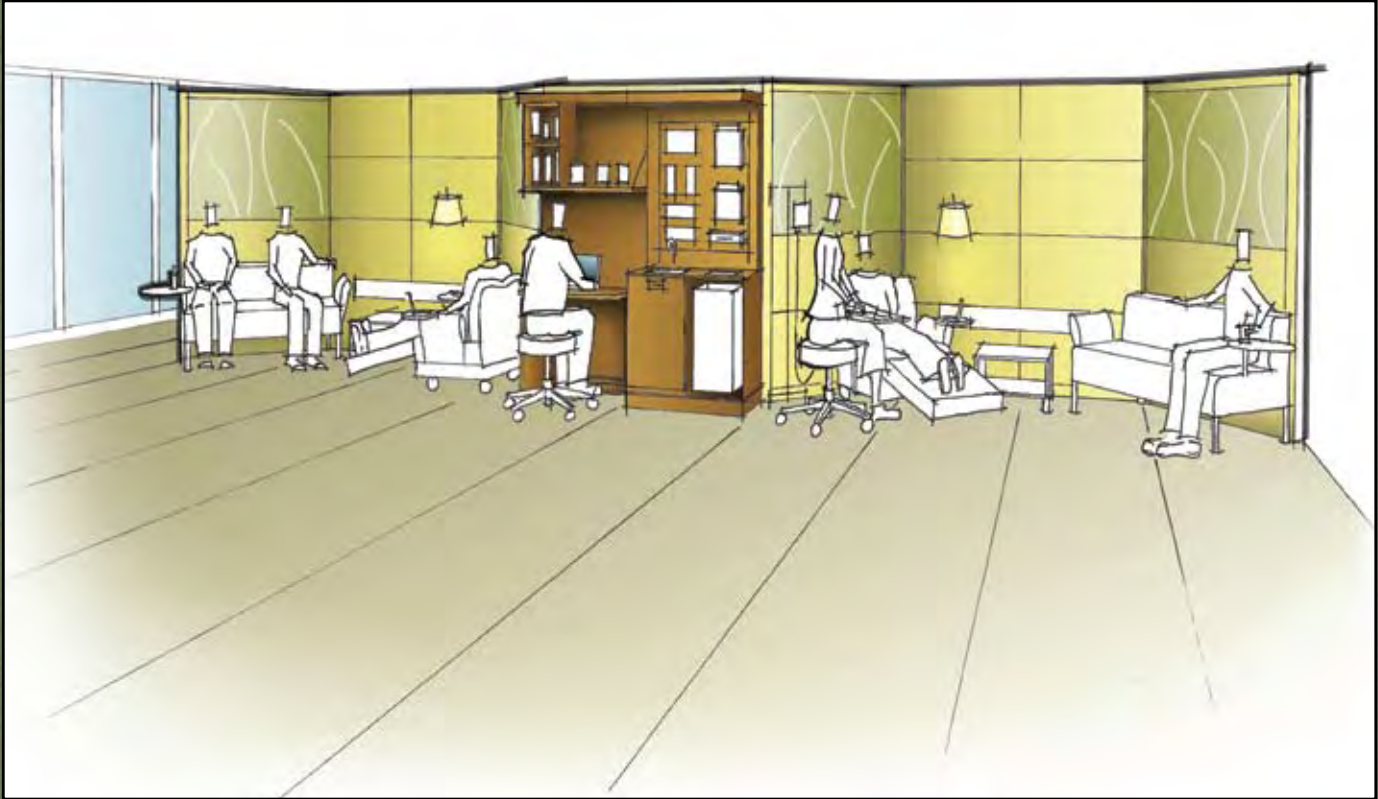


Figure 4. The shape of the Infusion Bays allows patients to create their own personal space while receiving treatment. Comfortable seating for family and friends means they can join their loved one in a relaxed, homelike setting. Patients in opposite bays have an opportunity to get to know their “chemo neighbor” during treatment.

Entertainment, views of nature, and other positive distractions can help to lower stress and improve the patient experience.

We asked current and former cancer patients to rank a set of needs they might have during care delivery. Among the physical, emotional, social and cognitive needs listed, all of the patients stated that the things that should be considered first and foremost above everything else were: *I am important. Treat me as an equal. Respect my values and preferences. Ask my opinion.*

These needs were prioritized over symptom control and access to food and water. This sheds light on the profound need that patients have to be seen as whole, thinking, individuals throughout their cancer experience.

Many healthcare organizations are meeting these needs by integrating complementary services into oncology care. In addition to the oncologists, nurses, radiation therapists and technicians who care for patients, social workers and psychologists, chaplains, medical massage therapists, acupuncturists, art therapists, and even pets contribute to addressing the many needs of the individual.

Many organizations are planning facilities that bring these different disciplines together for integrated care, as well as the patients’ convenience. Thoughtful spaces and adjacencies can help to support this paradigm and to create an environment that is focused on wellness throughout the cancer journey, not just on the treatment of an illness.

These insights and sketches represent a portion of our findings. For those interested in learning more, Nurture will offer a CEU and

LU credentialed seminar at NeoCon ’08 (June 9-10 in Chicago) that will discuss all 12 insights the team developed during the project and provide attendees an opportunity for a deeper dive into the research, design principles and accompanying thought starters. To register, visit <http://nurture.steelcase.com/oncologyreg>. **HD**

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