

Planning

for your new cancer center

– Marsha Fountain, RN, MSN and Myra Fouts, RN, MSN, OCN, CNAA

Cancer center design, whether hospital- or practice-based, requires the expertise and leadership of professionals who are highly experienced in not just the delivery of patient-focused clinical care but critical aspects of design and construction. Ultimately, space planning affects the quality of life of cancer patients and empowers everyone involved in helping healing thrive. Some centers, though well intentioned, have not met the threshold of a healing environment due to poor planning. This article describes some of the critical elements in cancer center design that results in improved patient outcomes, staff recruitment and retention and overall operational efficiency.



Infusion Bay at NYU Cancer Institute, NYU Langone Medical Center, New York © Chuck Choi ▲
Atrium at Mount Sinai Comprehensive Cancer Center, Miami Beach © Booth Studios ►



▲ Fireplace at Sletten Cancer Institute in Great Falls, MO. Courtesy of JK Lawrence Photography

Table 1: Cancer Care Trends

- ▶ Cancer is a disease of the elderly.
- ▶ Geriatric oncology is an emerging specialty.
- ▶ The majority of U.S. cancer patients receive their care in a community setting.
- ▶ Cancer incidence is expected to rise as the population ages.
- ▶ Every eight seconds a baby-boomer reaches the age of 50.
- ▶ The U.S. 65+ population (baby-boomer generation) is expected to double from 36 million ('03) to 72 million ('30); an increase from 12 percent to 20 percent of the U.S. population.
- ▶ As U.S. citizens age, and more survive their initial cancer diagnosis, expect them to become long-term cancer survivors requiring ongoing follow-up care and services.
- ▶ U.S. cancer care is fragmented; this leads to patient dissatisfaction and requires many patients to “circuit ride” to different geographic locations or care sites to receive multi-disciplinary treatments.
- ▶ Patients will “vote with their feet” to receive care from a tumor site-specific specialist (e.g. a fellowship trained breast surgeon, a fellowship trained urologic oncologist, etc.).
- ▶ Experts expect a 52 percent increase in hospital infusion volume between '03 and '13, due to an influx of patients previously treated in physician offices.

Plan the “Why” – Future demographics can affect current design

Leaders build or expand cancer centers – whether hospital based, freestanding or private practice – to provide needed services for cancer patients. As with any project, appropriate planning is a key success factor. What is the building or expansion goal? What demographic and market changes are anticipated? Leaders need to answer these types of questions to effectively achieve project success.

As most buildings have a 20-to-30-year lifespan, it is critical that leaders plan for the current environment as well as future clinical and market situations. Some critical trends leaders will want to consider are included in **Table 1** (at left). Each of these trends directly affects cancer care construction and building plans.

The institution’s primary and secondary service area sizes and demographic compositions provide the framework for quantifying current needs and for projecting future demographic trends. Sources for such projections include the American Cancer Society, U.S. Census Bureau, and Thompson Healthcare. However, leaders often find it most helpful to utilize cancer registries to determine new cancer cases. These data form the base metrics on which cancer centers should be planned. Both the institution’s own registry and the state registry will prove useful sources for such demographic information.

Leaders should ask the following critical questions and generate hard numbers, as appropriate:

1. What is the current volume of cancer patient visits and treatments?
 - a. What types of cancers do our physicians presently treat?
 - b. What plans exist to increase the number or specialty physicians/providers in the center?
 - c. Will the center house specific specialty programs or services?
 - d. Will leaders need to recruit specialty physicians?
2. Is this market growing/declining?
 - a. Consider not only overall population growth/decline; but also,
 - b. Natural population aging (maturation); and,
 - c. Where patients go for care (i.e. how far afield will patients travel to seek cancer care)?
3. What must leaders do to capture more of the market for this new cancer center? How can leaders differentiate this center and bring a competitive edge to the center?
 - a. Be realistic in calculating projections based on capturing market share from an existing competitor in a slow- or no-growth environment vs. a strong population growth area (one in which population influx might expand the overall healthcare population).
4. How quickly do physicians adopt new technology?
 - a. Does this institution include clear physician leaders who can promote change?
5. What are the projected volumes for all reimbursable services – e.g. physician visits, chemotherapy treatments, radiation therapy treatments and other services (i.e. genetic counseling, palliative care, etc.? What new services will be provided?

The cancer registry is one of the unheralded gold mines of any cancer program. These data libraries house critical information and metrics about practice patterns, top volume diagnoses, and patient origin zip codes. The market data available in a registry can guide clinical program planning for a new center.

Leaders however, will want to consider more than just patient volumes and finance. Effective planners will take into consideration clinical programs, recommendations for quality care, anticipated population growth and subsequent demand for cancer care services, types of physician specialties, and cost/benefit analyses for including specialty



▲ Accelerator at Sletten Cancer Institute in Great Falls, MO. Courtesy of JK Lawrence Photography

clinics and services (e.g. integrated medicine suites, site-specific multidisciplinary clinics, etc). Once leaders develop a comprehensive cancer center business plan, they can calculate a financial analysis that includes projected revenue, expenses, capital and program-specific viability assessments.

Healing environment and its effect on patient volume and health-care workers

When leaders incorporate innovative facility design, they serve the hospital’s objective of differentiating the cancer center from competing health-care providers. *Patient-centered design* is an important concept in health-care architecture. This concept approaches the design and planning process from the patient’s perspective; it further incorporates patients’ descriptions of their desired experience. When executed successfully, a patient-focused and staff-friendly approach can reduce the stress of treatment and increase patient satisfaction.⁷ Ultimately, this model has proven to provide a competitive edge in the community. Building in design elements that support staff spaces can also help employees cope better with workplace stress (especially in the oncology field), reduce absenteeism, help lower turnover and in several ways support employees in providing quality care.^{8,9,10} Well-designed staff environments are a positive factor in attracting and retaining qualified employees.

Plan the “Who” – Putting the team together

The next step to success is for leaders to create the cancer center planning and construction team. Bridging the gap between aspiration and reality takes vision, commitment, courage and a team that can both “think” and “do.” Other than the clinical representatives, the most vital project participants are the design/architectural team members. Architects practice in almost every U.S. city. A successful cancer center design and construction project, however, requires an architect with health-care experience and expertise, such as:

- ▶ **Prior experience in similar types of projects:** Cancer centers, particularly those with radiation therapy, are not general medical office buildings (MOBs). Technical requirements for a cancer center are unique and require an architect or advisor armed with a specific knowledge and skill set. In addition, including an individual (e.g. a nurse, patient advocate, etc.) who is empathetic to the particular needs of cancer patients is extremely valuable. By placing themselves in the cancer patient’s role (with help from the clinicians on the team), this individual guides the team to develop a design that ensures a vastly enhanced patient experience.
- ▶ **Philosophy:** Not all design firms work the same way. Some want a client to accept their plans with little input, some are more collaborative and work better as a team. Choose a firm which best meets your requirements (“Tell me what to do and I will do it,” vs. “Let us work together to design the best center.”).
- ▶ **Consultants:** While architects/designers are important, other participants are also critical. It will be important for leaders to ensure the mechanical, electrical and plumbing engineers are also well versed in cancer center design. Other consulting team members will include:
 - ▷ **Interior designers:** Interior designers are concerned with fabrics and furniture, with the interior flow of the facility, and with what the “feel” of the center will be. While interiors are discussed more fully in the last section of this article, assure that the interior designer is experienced in health-care design.
 - ▷ **Outside clinical consultants:** Often hospitals or practice leaders have little experience with new construction, and even less with building a specialized program and facility, such as a cancer center. Without such experience, it will

**Table 2:
Participants in Planning**

Clinical Team Members

- Administration/Management Representative(s)
- Physician(s)
- Nurses
- Therapists
- Pharmacists
- Laboratory Representative(s)
- Clinical Support Staff (e.g. physics, registration, nursing support)
- Current/Past Patient(s)

Support Services Team Members

- Facilities Representative
- Environmental
- Services/Housekeeping
- Infection Control
- Security
- Cancer Registrars
- Financial Counselor(s)
- IT Representative
- Communications/Marketing/PR
- Human Resources

be difficult for these leaders to anticipate the design decisions; how those decisions will affect the lifespan of the building; or staff and patient experience within the facility, for generations to come. The team might find it useful to have an outside clinical expert, an informed leader, at the design table. This individual will work with the architectural and clinical teams to bridge the specialty knowledge and to offer suggestions from previous cancer center construction experiences. Adding such expertise to the team can significantly contribute to the healthcare environment through improved designs. Such a person can bring ideas from multiple cancer centers, probe for reasons for decisions, and assist in developing a more patient-focused and staff-friendly facility. The authors have found that such an expert can also settle disputes between architects and clinicians by speaking with a voice of experience and clinical expertise.

Collect and verify references for all team members. Verify not only the firm's reputation and experience, but also those of the individuals who will work directly on this project. It is not unusual for a firm to show slides of successfully completed cancer centers during the interview, and then assign junior staff who have limited health-care or cancer-care experience to work on your project. Insist that all participating companies contribute project team members for whom your institution has references.

Other team members should include not only clinical and administrative departments, but also select representatives from the departments shown in **Table 2** (on p. 28).

Stichler and Cesario in 2007 stated that nurses are increasingly at the forefront of design teams.¹ Who better than a nurse to direct, lead and design patient care settings and health-care work environments? No other professional group spends more time at the point of service. Nurses experience the effect of the building environment on their professional practice every day. Moreover, they possess a wealth of knowledge about design features that either support safe, efficient delivery of care or those that seriously impede care delivery.² Other disciplines provide similar contributions to design. Including clinical experts as team members is required to design functional departments. Not allowing input will make for a very unhappy staff and could increase turnover. Unfortunately, often the clinical team wants more (i.e. space, equipment, details) and better (space, equipment, details) than the institution can afford, or than patient care requires in reality. Therefore, to avoid conflict and construction delays, it is imperative that final decision-making rest with a single individual – typically the department or cancer center director.

Plan the “What” – Services to include

Now that the design and clinical teams are collaborating, the work starts. The next step is to plan the clinical program offerings. Of course, clinical services are the most important programs. A list of possible services and programs to consider are shown in **Table 3** (at right). Leaders of all cancer center building projects (regardless of size or ownership), should consider (though not necessarily adopt), each potential service or program listed on **Table 3**.

Team members can plan basic departments – such as medical oncology and radiation oncology – a number of ways. For example, radiation oncology vaults can include doors and safety mazes, or can operate without doors or mazes. The control stations can also be combined, separate, closed or open. Decision-makers will want to know the options and review each one in light of how the current department operates. The design process will be most successful if team members research other centers and avoid saying, “but this is the way we have always done it.”



▲ Infusion area at Sletten Cancer Institute in Great Falls, MO. Courtesy of JK Lawrence Photography

Table 3: Selection of Services in Cancer Centers

Typical Clinical Services

Radiation Oncology
 Medical Oncology Exam
 (consider shared clinical space
 for visiting specialists)
 Infusion
 Pharmacy
 Draw Station/Lab
 Multidisciplinary Clinics
 Screening Programs
 Diagnostic Imaging
 (e.g. CT, PET or PET/CT, MRI etc).
 Breast Center
 Outpatient Pharmacy

Typical Support Services

Psychosocial Services
 (social worker, dietician, nutrition
 counselor, psychiatrist, etc.)
 Pain and Palliative Care Program
 Resource Center/Education Center
 Appearance Center/Boutique
 Integrative Medicine (CAM) programs
 Space for survivorship programs,
 support groups.
 Clinical Research
 Hospice Offices
 Rehabilitation/Physical Therapy
 Offices for the American Cancer
 Society
 Enterostomal Therapy
 Cancer Registry
 Administrative Offices

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If clinical and administrative leaders intend to include specialty programs within the cancer center, they will need to allocate space during the design period, or designate “soft space” within strategic areas that will allow for future customizing of space-intensive programs, such as integrative medicine or multidisciplinary clinics. Another option leaders can consider is to create undeveloped shell space that allows for future specialty program growth.

It is imperative that project planners choose required equipment before construction starts. This rule is particularly important when large medical equipment – such as CT scanners or linear accelerators – will be included in the building. Each manufacturer lists specific requirements for their equipment. These requirements can include room size, operating areas, mechanical and electrical needs, etc. Construction changes necessitated by mid-project equipment regulation adjustments are costly and time consuming. Even such items as chemotherapy chairs and exam tables can affect design.

In addition to clinical spaces, individuals consider patient support services important.³ Planners sometimes neglect or overlook the value and importance of family waiting areas, private family counseling rooms, and educational space. The earlier demographic data study should assist planners to identify specific patient/family needs. For example, some cultures may support each patient bringing a retinue of family members with them, especially during the early clinical diagnosis and planning stages of the disease. Individual patients from some cultures will be uncomfortable in shared gowning waiting areas in radiation oncology. Know your patients. Also, consider that as patient tracking systems are adopted by healthcare institutions, better planning and scheduling may actually reduce the need for the huge waiting room of the past. Technology can certainly affect design.

Plan the “Feel” – Patient and staff support

Just as evidence-based medicine is vital to delivering cancer care, evidence-based design is vital to a truly healing environment. In clinical studies, patient-centered design has been shown to lower nosocomial infection rates, reduce medication errors, lessen the need for pain management, and decrease patient falls.⁴ Increasingly, research demonstrates that environmental factors, such as natural light, pleasant views, artwork and even use of certain colors, have the potential to transform what would otherwise be a highly stressful experience into one that imparts a powerful healing and therapeutic effect. A “healing” design is intended to reduce the stress of cancer treatment and empower patients to feel in control of their environment. For example, when patients have individual control over temperature, lighting, and communications (e.g. cell phone use and the internet), it contributes to a more positive experience. Personal control then acts as part of the treatment.^{5,6} Implemented effectively, healing-focused and evidence-based design can potentially improve a cancer patient’s ability to cope with the emotional and physical aspects of the disease and its treatment – and, ultimately, increase patient satisfaction.

Studies show the same healing environment that provides a calm reassuring setting for patients and families is advantageous to staff, administrators and clinicians. For example, natural light and a less noisy, chaotic environment can help decrease distractions and minimize medical errors.⁷ Furthermore, many of today’s workers are aged 40 and older. Improved lighting helps them do their jobs accurately. These same workers are sometimes sensitive to having to walk long distances, along lengthy corridors, to obtain supplies and medications. Another important design element includes decentralized charting stations placed in proximity to a fixed loca-

tion for collaborating about patient care. This design concept allows staff to spend more time in patient care and to respond to patients more quickly.

A new cancer center is not just about physical design. Much planning and collaboration among expert team members goes into achieving the desired end result – an operationally efficient, patient-centered facility with a healing environment. As a new building is being constructed, clinical leaders are presented with an opportunity to re-design patient-care processes to make them more operationally efficient, more compliant to regulations, safer, and more satisfying for patients. All team members have an opportunity to evaluate leadership practices, structures, processes as well as staff development, to make them more efficient and patient-focused. A patient-centered building and environment is complemented when leaders create a patient-centered culture and incorporate evidence-based service standards.

Conclusion

At some time in each cancer program administrator's experience, s/he will undertake either renovation of an existing facility or, if fortunate, building a new cancer center. This article helps to assist these leaders by identifying questions and issues that they may encounter during the planning phase of a new cancer center. The authors' goal is to make that experience successful for the patients and staff who will be served in these new cancer centers. 

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