

# Cancer Center Building Blocks

*Oncology Issues* reports from the recent ACE conference on cutting-edge cancer center design

by Don Jewler

Cancer care leaders gathered in Indianapolis, Ind., April 29 to May 1, 2009, to learn about the building blocks of cancer center renovation, expansion, and new construction. Three days of expert presentations underscored a common theme: Building a cutting-edge cancer center requires complex design, years of joint planning, and more money than initially budgeted.

“Cancer is 11 percent of the hospital service line. Even in an economic downturn, construction projects are still going on,” said Fuad Hammoudeh, FACHE, of the Indiana University Simon Cancer Center, Clarian Health in Indianapolis, who spoke at the meeting sponsored by the Association of Cancer Executives (ACE) in collaboration with the Association of Community Cancer Centers (ACCC) and the American Society for Health Care Engineering. Steady outpatient growth, an aging population and rising numbers of cancer diagnoses (1.3 million in 2000, 1.6 million in 2010, a 21 percent increase), and a moderate inpatient growth of 5 percent are driving the construction, said Hammoudeh.

## A Team Approach

Joint planning with physicians, employees, hospital leaders, and patients is high on Hammoudeh’s list of critical success factors needed in the complex design of facilities for medical oncology and hematology (clinics, infusion suites, pharmacy services, and specialty clinics), as well as radiation and surgical oncology, and ancillary, support, and inpatient services.

According to many presenters, a first requirement of any construction is defining the strategic vision—what is driving the notion of doing the project and how many dollars can be spent—and the project objectives, also known as the “functional program.” The functional program includes the business case, operational models, applicable codes and standards, space needs, assumptions about building materials and systems, furniture, equipment, and cost and schedule expectations.

“Everyone must agree with these assumptions, before the design team goes forth. Sounds simple, but people seem to short circuit the process,” said Ken Cates, co-founder and principal with Northstar Management Company, LLC, in St. Louis, Mo.

He defined three separate project teams, each with their own roles and responsibilities:

1. The owner team of hospital administration, support services, consultants, and vendors
2. The design team of architects, engineers, interior designers, civil and structural engineers, and specialty consultants
3. The construction team of the general and managing contractor, multiple sub-contractors, and material suppliers.

“Match the expertise with the task. Then, design an organizational chart,” he advised. “Doing projects is tough—a Rubik’s Cube, trying to get the ten-headed team to talk together.”

## Stakeholders are Key

Several presenters suggested the need for a dedicated administrative staff person who understands each role and can help coordinate meetings between owners and other teams. This person is accountable for all the paperwork and invoicing, a single source conduit to facilitate a complex process among the design and construction teams and all stakeholders.

“Who are the stakeholders?” asked Susan Bower, MBA, BSN, clinical specialist with NBBJ, a design firm in Columbus, Ohio. “Everyone who uses, runs, gets treated in, visits, operates, and supports the organization. Understand their points of view.” Listen to your staff and patients. Conduct focus groups to understand their likes and dislikes. Bower stressed the importance of working with stakeholders early on to assess organizational needs and develop a collective



vision that provides both inspiration and guidance for the design team. “The project vision is not a doctrine or a perfect ad campaign, but it serves to prioritize the most important features that will create a successful project.”

“You need to have those stakeholders not just at the beginning of the planning process. They must be there all along—and particularly at the sequencing of how new tech-



Top: Roof-top garden at the University of Colorado Cancer Center's Anschutz Cancer Pavilion, Aurora, Colo.

Above left: Warm lighting and views of nature at the Pluta Cancer Center, Rochester N.Y.

Above right: An example of an onsite family-supportive amenity is the Hawthorne Cancer Resource Center at The Thomas Johns Cancer Center, Richmond, Va.

At left: Walking path at The Curtis and Elizabeth Anderson Cancer Institute, Memorial Health University Medical Center, Savannah, Ga.

deliver HDR," said Rager.

And while Rager and her stakeholders may not have a crystal ball, she does use national oncology consultants and the Thomson Reuters Emerging Technologies Market Impact Tool to look at what advances may be five to 10 years over the horizon.

"A case in point is breast cancer," she said. "Pharmacogenomics, or personalized medicine, will

impact breast cancer by 2015. Digital imaging is now a near requirement, while tomosynthesis may replace a large portion of mammography volumes in the five-year time frame." She also looks ahead to breast MRI not just for diagnosis and high-risk screening, but also for pre-surgical assessment and treatment monitoring. According to Rager, breast cancer is virtually an outpatient service with facility implications for outpatient treatment areas, diagnostic services, patient and family waiting areas, parking, and all the concerns associated with customer-accessible outpatient services.

Big technologies need their own business plans. To help in planning, Rager has developed a current technology inventory and a new technology checklist, which lists more than vendors and costs; it asks such questions as whether the new technology *measurably* improves patient service or care, requires supporting technology and new or incremental staff, and has a champion.

### Know Your Market and Your Competition

Just as important as technology planning and communication among physicians, staff, and leadership is understanding your demographics, according to Sharon Dearman, founder and principal of Dearman & Associates, LLC, a marketing consulting firm based in Houston, Tex. "Sixty to 80 percent of your patients will come from the county in which your facility is located. Look at your commuter patterns. People seek out care near where they live and work. Look at growth rates within the county. Are people moving into your area?" Dearman advises understanding disease propensity—the likelihood of different ethnic groups

nology is installed," said Carrie Rager, a marketing/planning executive with Clarian Health in Indianapolis, Ind. Rager engages key stakeholders to aid in her technology planning—to identify current technologies and assess emerging technologies, and those that may be headed for obsolescence.

"Generations of technology may come and go. You do not need, for example, a vault 25 feet by 25 feet to

to develop certain cancers. “Tie information together. See where the growth is.”

Dearman also advises market analysis of competitors as part of the early planning process. She uses Intellimed to track strengths and weaknesses of competing organizations and physicians.

Fundamental to success are good utilization data; well-thought-through growth assumptions for inpatient, outpatient, ancillary, and new programs; and written documentation of the planning.

And almost everyone advised budgeting well for contingencies. “No matter what you do, unexpected events will come up and bite you,” said J. Russell Dilts of Ascension Health, and former chief administrative officer of the University of New Mexico Cancer Research & Treatment Center. For Dilts, his unexpected events included a concrete shortage, sky-high copper prices, and even an underground stream that threatened the foundation.

### Build New or Renovate?

There are plenty of reasons to choose renovation over new construction: lack of available real estate, an infrastructure that has the capacity to meet increased service needs, and/or adequate square footage for build-out needs. Incremental phasing may allow for additional cost distribution and reduced disruptions.

“If you’re considering renovation, look at the existing facility with a keen eye,” said Sheila Cahman, AIA, ACHA, LEED, AP, group vice president with HOK, an architectural and design firm in Chicago, Ill. “Understand critical volumes, desired adjacencies, staffing efficiencies, the site, and existing technology.” Knowing details of the structure and engineering system of an existing facility is particularly important, she advised. “What is the structural capacity, shielding requirements, HVAC power, emergency power? You’d be surprised at how few hospitals have adequate emergency power in place.”

Renovation projects require staff input and buy-in. “Communicate frequently and focus on the end result. Keep the renderings in the staff lounge,” said Elaine Kloos, RN, CAN-BC, MBA, senior consultant with the Oncology Management Consulting Group.

She advised that the operational challenges of renovation—including disruptions, infection control, engineering system shutdowns, and accessibility issues—can be daunting. Even parking may be affected. According to Kloos, parking may need to be

relocated off-site with a shuttle service. “And you may need to relocate chemo chairs. You may not be able to accommodate your 30 chairs, so you’ll need to expand your treatment day and work overtime into your budget, or hire extra staff.”

Are all the disruptions worth the trouble? Maybe not.

“Renovation is not any less expensive,” said Joseph Colella, MBA, project manager for Balfour Concord in Charlotte, N.C. And maintenance costs on renovated buildings are 25 to 40 percent higher than new, according to Colella. Optimized design of a new building can create greater staff efficiencies.

Still, if you’re thinking about renovation, factors to consider include the age and physical condition of the building, capacity and limitations of major building systems, cost of maintaining and operating existing versus new, and accessibility and physical limitations, according to Colella.

A final step after renovation or new construction is complete and the doors have opened is for the architect and designer to provide a thorough assessment. Post-occupancy evaluation at six months to one year is critical, according to Natalie C. Miovski, AIA, LEED, AP, principal with EwingCole, and Myra Fouts, RN, MSN, OCN, CNA, of Aptium Oncology, Inc. Interviews with staff and patients in private should examine what works well, how the process could have been made easier, and whether the new space is the ideal space.

At right: Healing Garden at Santa Fe Cancer Center, St. Vincent Hospital, Santa Fe, N. Mex.

Below: Architectural renderings of the Bearden-Josey Center for Breast Health at Spartanburg Regional Hospital, Spartanburg, S.C., feature design elements such as warm lighting, views of nature, more windows and lower window sills, and gardens.



## Design Trends

One current trend is toward designing by “flows” and not by traditional departmental boundaries.

“One of the biggest factors demanding attention is the dissolving of walls between hospital departments,” said Kathryn Simmons, RA, an independent architectural and design consultant in Glen Ellyn, Ill. “Inter-operative procedures place surgeons and radiologists in the same treatment space, and registrars gather patient data bedside.”

Trends in cancer statistics point to more exam rooms, more consult rooms, more minor procedure-type rooms, higher acuity treatment spaces in outpatient settings, and more counseling spaces, and less demand for inpatient ORs. New design frequently features a “healing environment,” which fosters increased satisfaction with patients as well as staff. Warm lighting, views of nature, more windows and lower window sills, roof-top gardens (get buy-in from infection control), and walking paths with sculpture are definitely “in” these days. Also popular are off-stage areas for caregiver respite, as well as onsite family supportive amenities for staff such as childcare.

“Quality of Life Centers” may include counseling offices, an image recovery salon, wig station, massage, acupuncture, speech therapy, and retail pharmacy. The center should be in a high-visibility, high-traffic zone with interior windows that allow patients to walk by, look in first, and then enter.

Design elements that may seem the smallest can be of great consequence, according to Simmons. Making her “oft-forgotten” list are: space for waste, storage space for linens, rest stops on corridors, sound control, input from the disaster planning team, wheelchair turning radius (always greater than 36-inch diameter), and internal signage.

New design standards will arise as cancer treatment protocols change, technologies evolve, and new options open, according to Simmons. “Always, the best practices become the standards for others to adopt,” she said.

## Distraction and Interaction

Relatively new to the design scene is evidence-based design, the process of basing decisions about the built environment on credible research to achieve the best possible outcomes. Evidence-based design is an outgrowth of a 1984 study that showed patients with an outside view had shorter hospital stays and used less pain medications, for example.

Evidence-based design focuses on noise, light, universality, hand washing, positive distraction, and private rooms, according to Michael Pukszta, AIA, principal with Cannon Design in St. Louis, Mo. Although most inpatients want private rooms, oncology patients undergoing outpatient infusion do not. Only three percent want total privacy, away from nursing staff. Based on study and survey results, he advises groups of three to five chairs in the infusion area. Heated infusion chairs are becoming popular. Ninety percent of patients want guest chairs in the infusion area. Pukszta also stressed the importance of patient control of temperature and lights, access to food and drink, and views of nature.

“Positive distraction and interaction” are important, according to Pukszta. “Data show that gardens

are more important than 100,000 square feet of building,” he said. “Patients report they want ‘something normal that brings you back home.’” That includes courtyards, space for family to feel comfortable, and socialization areas.

Color creates a facility’s personality, defines its style, sets the mood, and controls the space, according to Linda J. Mitchell, CID, president of Mitchelldesign in La Jolla, Calif. “Spaces should use the full spectrum of colors (whether you choose cool or warm colors as the dominant color) in all healing environments,” she said. The right color application adds warmth to the environment and, if funds for artwork are not available, adds interest to the walls.

A pleasant diversion of murals, photos, and art can reduce stress. “Form an Artwork Committee to develop an artwork standards program,” said Mitchell. “Select artwork indicative of the region.” She advises against images of food and abstract art, which may be difficult to view when the patient is medicated and may provoke tension. Appropriate artwork shows serene, spatial, open nature settings. A Design Committee should oversee and create standards for artwork, as well as other design elements, with the interior designer to promote uniformity and consistency.

## Final Words

A well-thought-out cancer program that is operationally efficient, patient centered, and staff friendly does not happen by itself. Successful projects start with a clearly defined vision and engaged stakeholders. Careful consideration must be given to the program and space layout.

“In planning, every staff person has something to contribute,” said J. Russell Dilts. “We spent hours trying to make the planning process inclusive—weekly tours of the building under construction, show and tell all throughout the process.”

Successful design does its best to anticipate the future. Many presenters reported that new construction projects held vast shell space—square footage left empty for future expansion as patient volume grows and as new technologies move from research to practice.

“Changes in cancer care require space flexibility,” said Marsha Fountain, partner with The Oncology Group in Austin, Tex. Among the changes in cancer care she sees are more physician requests for employment at hospitals, increased use of oral medications, and mobile technology that replaces fixed computers. Each will impact healthcare design. “You need flexibility...to be able to break down walls and combine areas for physician office practices, for example,” she said.

One trend is healthier “sustainable-design” hospitals that are water and energy efficient, use renewable and low-maintenance materials, and allow increased interior sun access, according to Russ Sedmark of Heery Design. Hospitals that achieve LEED (Leadership in Energy and Environmental Design) certification will increase.

Good design sells the facility to patients and staff. But designing a cancer center is not just about the “perfect” design; it is about designing the perfect cancer center to meet the needs of *your* patients and staff. ❧

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