



## FOCUS ON HEALTHCARE DESIGN

Evidence-based design takes on new meaning as health organizations learn from what works and what doesn't in their own operations.

■ By Ruth Simon McRae

*Patient-controlled lighting highlights landscape murals in ThedaCare Regional Cancer Center's radiation therapy room, with Marmoleum Striato linoleum flooring by Forbo. Photo by Paul Crosby.*

In an era when evidence-based design is highly valued, healthcare groups are finding that they can mine their own operations for this information. Instead of, or in addition to, going outside to benchmark for best practices, owners, facility managers and designers are able to learn from what works in their own buildings.

While hospitals may represent the largest facilities in a healthcare system, they are only one part of the healthcare design equation. Large health system networks operate a full range of facilities, covering every type of care, from the most acute—hospitals—to ambulatory care and clinics. Ambulatory care includes most categories of outpatient healthcare, from specialists' clinics and outpatient surgery to eye care, pharmacy, pediatrics and general health. Physicians' clinics are a smaller subset of ambulatory care.

Flooring is a fundamental part of these buildings. The trend toward resilient and hard surface flooring in hospitals continues, with carpet taking up less and less of the floor plate. Based on experience, rubber has emerged as a material of choice for healthcare. Yet carpet's acoustic quality—along with its warmth—make it an ideal solution for many non-treatment spaces.

### **HGA: THEDACARE REGIONAL CANCER CENTER**

While planning its new 84,000-square-foot facility in Apple-

ton, Wisconsin, ThedaCare Regional Cancer Center was determined to create something very special. According to Kate Bautista, associate vice president at HGA Architects and Engineers, "Everyone from the client team was at the table, pushing us to do our very best. This was a rewarding process for everyone."

Speed to market was a critical requirement for the cancer center, as a local competitor was aiming to open its facility first. To achieve the design and construction schedule of 12 months, the architect, owner, construction manager and subcontractors developed a process to save months over a typical schedule. One key tactic involved bringing in trade partners early in the process in order to avoid any schedule delays.

"Being within the Appleton community, we wanted to connect with the group of people it would serve," says Bautista. "Part of how we did that was looking at the 53-acre site. There was a grove of trees, local plants and prairie. Creating exterior views was part of design strategy."

Specific outdoor gardens were created for the infusion patients; designers imagined that one day the patients might even



*ThedaCare Regional Cancer Center's lobby features terrazzo flooring. Photo by Paul Crosby.*

have their treatments outdoors. Bautista adds, "Having the views, having that connection to the outdoors has historically been a proven evidence-based design principle for relieving stress and anxiety, trying to make the best of a situation you do not want to be in."

The design team prioritized the outdoor views for both infusion and staff areas. Exam rooms, radiation oncology and other functions were located in the building core, which is windowless.

Designers decided to keep finishes quite light in these interior spaces and offered positive distractions for the patient getting treatment. To accomplish this, radiation therapy rooms were given graphic wall coverings with three different murals of outdoor views. These rooms also have controllable lighting, allowing patients to dial in their favorite color through the perimeter LED fixtures and alter the color tone of the room.

The main lobby has large window walls that offer views of landscape beyond, drawing those elements visually into the interior. Terrazzo flooring in the lobby incorporates the sparkle from bits of river rocks from a local source in Wisconsin. The space is heavily daylit, so designers selected a rich color for the flooring and reduced the sheen with an eggshell finish. A highly textured wood wall—establishing verticality and referencing the trees outside—and natural stone finishes are rich textures that create the foundation for a timeless design.

Rising up through the two-story public space, a monumental staircase in yellow back-painted glass introduces a cheerful accent color that connects up to the landscape, like the black-eyed Susans outside the windows.

Staff wellbeing and collaboration were a high priority in the

project. Office areas have a collaboration-friendly open office layout with sit-stand desks and a bright palette to give energy to staff. At the same time, quiet spaces away from the open office provide areas of respite, allowing staff time to decompress after especially difficult days.

Interface carpet tile—the biophilic Net Effect and the linear Alliteration—were specified in corridors and in all of the family and community areas. The selection of carpet was largely based on acoustics to make sure privacy would be upheld. The densely constructed carpet also functions well for wheelchair mobility. According to Bautista, "The non-directional mottled carpet combined with the striped or striated pattern helps differentiate main street from all the various corridors leading back to the exam rooms. The flooring also assists in wayfinding."

Bautista adds, "Universal design was a key principal throughout the facility. Many clients are older, so we were careful to use proper contrast in flooring color selection, to make sure that there were no perceived holes to cause a visitor to feel like they might fall."

For corridors and treatment areas, designers selected Forbo Marmoleum Striato linoleum tile and sheet goods in an abstract linear pattern that references both veined travertine and the feeling of wood. Mannington's Intersect, a textile-look heterogeneous vinyl sheet, and Nora's Noraplan Sentico rubber flooring were also used in the project.

Patient rooms are soothing yet uplifting, with a calm, almost spa-like feel that is enhanced by the soft light to mid-tone hues. Bautista explains, "We used research to inform the color palette. Knowing that blue is preferred by both genders, we used a heavy amount of this watery blue that could relate to the sky. We thought about glass and timeless materials. Greens, in my opinion, are often best suited to use in the artwork, and that is where we used a variety of different greens."

Artwork creates the vibrant color within each space as well as offering interest and positive distraction. Artwork is even hung in the bathrooms, complementing upscale finishes such as subway tile on the wall and 12'x12' ceramic tile on the floor.

Flooring clearly provides the foundation for the design, as well as an overall feeling of warmth. In general, although there is variation in pattern type and material, the flooring has very much the same warm neutral tone.

ThedaCare Regional Cancer Center followed the Living Building Challenge's Red List "because it is a cancer center, and it felt wrong to incorporate any toxic material," according to Bautista. "The Living Building Challenge is an organization that has multiple categories on how to design a sustainable/responsible building. We didn't take on the full Living Building Challenge, but we did take on the elimination of ten to 12 top harmful toxins."

## **HOEFER WYSOCKI: WILLIAM P. CLEMENTS UNIVERSITY HOSPITAL**

Hofer Wysocki has been working with the William P. Clements University Hospital at UT Southwestern Medical Center (UTSW) in Dallas, Texas for many years. According to

## NEW LUXURY DEVELOPMENT IN HAWAII

**K**aren Muraoka, principal of Karen Muraoka Interior Design in Honolulu, Hawaii, works closely with Hawaii Pacific Health, an organization that operates large medical centers on Oahu and Kauai, and ambulatory care centers on other islands. Hawaii Pacific is one of four large healthcare entities—along with Kaiser Permanente, Queens Hospital, and Castle, an Adventist hospital—that control most of the medical facilities on the islands.

“Here in Hawaii in the last few years we have seen a new format for primary care clinics starting to emerge for Hawaii Pacific,” says Muraoka. “They may be located in a corporate building on a couple of floors or in a few suites, offering medical clinics within working communities and beside residential communities.”

One major trend Muraoka describes is the current building boom in Hawaii, where a huge number of major condominiums are being built in very exclusive areas. Many of these buildings are 40 stories tall and have beautiful ocean views, offering proximity to shopping, Waikiki and entertainment. They often have luxury retail stores on the ground floor. These developments are being purchased by offshore investors from Europe, China, Korea, Japan, and Canada. Many are corporate entities.

Muraoka’s latest project is Straub Hospital Primary Care in Ward Village, a new clinic for Hawaii Pacific Health that will be housed in a 5,000-square-foot space within one of these luxury developments, next door to a Whole Foods store. The clinic speaks to the demographic and will have a very upscale look.

Waiting areas and corridors will feature LVT flooring. Patient rooms—exam and treatment areas—and staff areas will be sheet vinyl or rubber with welded seams with integrated cove. In non-treatment rooms, Muraoka may select a rubber cove base.

The facility manager of the project brought requirements to the table based on prior experience with other facilities, including a desire for a thick wearlayer, possibly 40 mil, and a concern about any physical texture in resilient flooring that would grab soil.

Muraoka would like to use carpet in certain areas, yet has chosen not to. She notes, “The client loves carpet for acoustic comfort, but that is trumped by a need for cleanability, infection control and longevity. We also would like to use wall covering, yet they can only use protective wall covering due to climate issues.”

The facility will be brightly lit by natural light, so the color palette will be rich and saturated, bringing up the blues and greens of the ocean and including dark woods, with accents of ocher, bronze and metallic flecks.

In keeping with the luxurious space, special ceiling finishes, hand-painted artwork on walls and specialty flooring patterns will be integrated into the design.

Muraoka adds, “Sustainability comes into play in this project with the selection of cleaning materials, and also materials selected for covering furniture that is solution-dyed or silicone-based. Durability is also considered a key component of sustainability. The client only says no to PVC in a few special instances. The most important requirement is infection control, which in effect takes precedence over all other requirements.”

Clemente Jacquez, associate vice president and design director, “Our design team started working on this project since it was first considered as an expansion to, rather than a replacement of, the old St. Paul Hospital. It’s always a question as to how you strategically expand an existing hospital chassis with building system issues. After vetting schematic scenarios, UTSW leadership determined it was best to start a green campus from the ground up.”

The hospital is 1.2 million square feet. The Tower 3 expansion adds roughly 650,000 square feet between the podium, which houses all diagnostic and treatment departments, and the patient tower. Tower 3 increases the number of patient beds by 292 to a total of 752 on campus.

Flexibility and modularity of spaces are key. Jacquez notes, “Tower 3 is in the shape of a ‘V’ that connects the two ‘W’ shaped towers. At the back of the ‘V’ are two staff elevators that connect directly to surgical and diagnostic functions for staff, and the tip of the ‘V’ is the public elevator lobby that provides access to the main public lobby areas and patient rooms above.”

This design separates staff and treatment functions, and it shortens corridors for both the staff and patients, bringing patient spaces to a more human and less institutional scale. Haewon Kim-LaBroad, vice president and director of clinical planning, says, “It’s a very clear pattern of onstage and offstage circulation that allows separation of public and service/staff to minimize ‘conflict’ in those circulation patterns.”

The project team has learned from the original two towers. “We engaged in very detailed user group meetings,” says Christy Murphy, associate vice president. “Because the owners had lived in the building for three years, they had many lessons learned—be it architectural or maintenance. We were able to hear firsthand from the users of the facility, especially in regards to the finish and flooring considerations for Tower 3.”

For flooring, designers split the building into two areas, utilizing rubber flooring in diagnostic and treatment spaces, and vinyl flooring in the inpatient care units. One lesson learned involved the thickness of the rubber flooring in the operating room (OR); for Tower 3, the specification was changed from 2mm to 3mm in order to reduce staff fatigue during surgery.

Sheet product was specified only in lab and surgical environments where required by code and for the purpose of high infection control, in order to minimize the location and need of welded seaming. Otherwise designers preferred modular tile product, whether rubber or vinyl, as there are no welded seams that could draw dirt. Nora’s Noraplan Environcare rubber flooring was selected for the podium floors and Armstrong’s Natural Creations LVT for both corridors and rooms in the patient tower.

The color of the floors change based on the function of the unit. For example, the color of the circulation zones is different from the color that defines the core support areas of the unit.

According to Tiffany Kalloor, Hoefer Wysocki’s director of interior design, “We determined the performance and aesthetic needs for each area and established the color palette



Shaw Contract's The Socialite carpet tile sets off museum-like space in the physicians' lounge at UT Southwestern.

based on desired pattern and color contrast. A simple example would be the color of the floors for the OR. We brought in surgical needles and, if a needle fell on the floor, tested to see which color camouflaged that needle and which allowed us to see it (of course we wanted to see the needle!). The lighter flooring color won out. So it wasn't just about color for the

sake of aesthetic appeal; it was about the appropriate contrast for function."

Kalloor notes, "Specific to the patient room, we had a mock-up room we worked on for many months, actually a couple of years if you include the timeframe for the rough build-outs. We fully implemented every design option—both architecturally and finish out. We worked hand-in-hand with the vendor to incorporate customization of scale or pattern if needed. The process was important as it allowed us to feel confident in our choice and palette of

the room before implementing the design hundreds of times.

"What's been in our favor is constant technology improvements. A huge technology shift is with diamond particulate integrated into the flooring topcoat to enhance performance and to strengthen the floor. We are able to incorporate that technology in the expansion."

## MILITARY HEALTHCARE DESIGN

**J**anet Kobyłka is senior interior designer at Workplace Solutions, a Jacksonville, Florida-based company that does initial outfitting for military healthcare facilities. The woman-owned small business holds General Services Administration contracts; its overall mission is to provide turnkey initial outfitting and transition/commodities for government and commercial projects worldwide. This typically involves furniture, medical equipment, transition planning, signage and art. On some projects the firm provides the structural architectural design as well, such as interior design and finishes. Its facilities include hospitals and clinics, inpatient and outpatient, with multiple projects going on at one time.

Kobyłka has been working in the public sector after 25+ years in private sector interior design. She notes that the selection criteria between public sector and private sector healthcare are basically the same. Yet the process is somewhat different, because budgeting is done before product selection. "The military wants you to give them the price first," Kobyłka says. "If you need to modify the price later because the material selected is more costly, there is a process for that. It may be harder or easier to change the price, depending on the project, and depending on which branch of the military you are working with."

When it comes to healthcare flooring, according to Kobyłka, "You need to have a slip-resistant floor, but it needs to be a relatively smooth surface at the same time because you don't want to create a trip hazard for people who shuffle or have walkers. You need to create as little resistance as possible for people pushing a wheelchair or gurney. And you have to really watch the compression testing results, the PSI (pounds per square inch) rating of your floor. LVT, rubber, sheet vinyl can go as high as 2,500 pounds per square inch; resin and travertine also have good PSI. Manufacturers keep changing and improving this." Other issues are environmental properties, cleanability and cost.

When possible, Kobyłka specifies rubber for most areas of a hospital: corridors, nurses' stations, treatment rooms—ev-

erywhere except for the lobby. "Rubber is the best healthcare flooring there is," she notes. "I use it whenever possible, but there again, you have to get the client over the cost, which is typically \$6 per square foot and higher. Rubber is inherently antimicrobial, has softness underfoot, is easy to maintain—cleanable with water and soap. You can cove the base up the wall. Rubber allows for creativity as it can be carved or laser-cut into patterns."

Kobyłka prefers terrazzo for the main lobby for its durability and smoothness, as well as its aesthetic and sparkle. She adds, "Terrazzo is wonderful; it is attractive, environmentally friendly and easy to maintain. Cost is the issue, as it starts at around \$12 per square foot and goes up depending on the material components, design and number of colors." Kobyłka primarily uses a neutral, timeless palette. "You have to be very careful about what colors you pick because it is a 50-year floor!"

Carpet may be specified for certain facilities. "We typically specify carpet tiles with an antimicrobial in the backing," says Kobyłka. "But possibly 25% to 30% of hospitals will not allow carpet in any areas. In outpatient facilities, carpet may be appropriate for waiting areas and offices. Part of the issue is facility location. If the facility is in Louisiana with its high humidity, you are far less likely to want carpet. Carpet would be more appropriate for a facility in Colorado, with its low humidity and colder climate. These same issues impact the use of wall covering. Places that have issues with mold growth don't want to use either carpet or wall covering."

According to Kobyłka, the military considers many of the same key issues as the private sector when evaluating sustainability. She adds, "These are: how a product is manufactured and the resources used; how a product can be disposed of; whether a manufacturer will take it back and if they do, what it will become; and the types of materials used in manufacturing. The military is very balanced about PVC, and evaluates its use on a case by case basis." Another important consideration is how the flooring will be maintained, what kinds of chemicals are needed to clean the floor.

Carpet tile was specified for waiting areas, offices, conference rooms and internal staff corridors. Carpet tile by Tarkett's Tandus Centiva, called Change, was used both for seating areas in the atrium public lobby and in waiting rooms in the patient tower.

Kalloor adds, "Another place we used carpet was in an education center for the original project—not as part of the expansion—that serves as a destination environment specific to training and private events. This space has more of a corporate interior feel. Shaw Contract's The Socialite and The Eccentric carpet tiles help to transform the look into a whole different space."

Terrazzo flooring with a semi-gloss type finish was used in the main public areas. Says Kalloor, "We took advantage of exotic aggregates that have a reflective quality, like mother-of-pearl. Our public atrium/lobby spaces have a lot of daylight and we didn't want the flooring to create undesirable glare."

Kalloor notes, "The flooring and how it contrasts or complements a big space with natural light was paramount in creating a museum-like experience. This was key to enhancing the patient experience, creating public spaces that allowed for respite and reflection. UTSW embraced an art campaign as a focus for patient experience, implementing an art program worth \$10 million just at this facility. When you look at the art, selection

and curation—they take into high consideration the context of each piece." The space is anchored with the dark floor and lighter walls, focusing attention on the beautiful artwork.

"The palette and patterning can be interpreted as visually quiet," says Kalloor. "We have been able to use the artwork to modulate the space, for example stimulating with an abstract piece that has high color contrast or using photography to quiet a space down. You see that even in the flooring, such as the dark color with the terrazzo in public areas. We also wanted the patient unit to have a similar feel. Flooring is not there to be the star of the show; it should help create visual balance and functional performance."

### HDR: KAISER PERMANENTE CHINO GRAND

A&D firm HDR and Kaiser Permanente are long-term partners, which has enabled them to collaborate on developing new ways to imagine outpatient clinics. The goal of the collaboration was to integrate Kaiser Permanente facilities in a way that would make scale more approachable and easy to navigate. Originally known as the Reimagining Ambulatory Design (RAD) platform, the concept has been renamed the Health Hub.

The first Health Hub was built at Kaiser Permanente Manhattan Beach, a southwest suburb of Los Angeles. Kaiser Permanente Chino Grande is the second and larger-scale outpatient clinic built with the Health Hub concept. Chino is just east of Los Angeles. Since this was the second project, designers were able to learn from the first. Colors and materials evolved; even the interior design itself evolved in response.

As Susan Suhar, interior design director at HDR, explains, "We learned that they needed more flexible finishes in terms of how they are allocated. When you start carving out spaces, defining a space within a space only with material, you are committed." Zoning spaces with flooring can show where furniture should be positioned, for example; changes of materials can define transitions. This is true of both flooring and ceiling. "Sometimes designing a space this way is good—to define a seating area for example—yet sometimes not. These kinds of spaces prohibit the facility from being able to redesign and reconfigure the space as they see fit and as its usage evolves."



William P. Clements Jr. University Hospital at UT Southwestern Medical Center.



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Suhar adds, "It's a bit of a trick, how we are using materials to define space and how we utilize materiality for wayfinding, while at the same time we have to respond to the huge need and demand for flexibility that owners desire. This is actually true for all markets, including corporate."

In the Health Hub, public spaces—lobby, reception, retail and thrive bar—make up the public square. While building the Chino Grand facility, the organization and design of the public square was changed based on lessons learned at Manhattan Beach. The key issue in this facility was deciding how to manage throughput as patients arrive.

"The biggest differentiator of the design is that in a 360 degree view you can see a pharmacy and other places where you need to go," says Suhar. "The organization of the space is very open; visitors are not walking down many corridors. Throughput of the patient is key to design, and we wanted to make moving between areas intuitive." There is also a concierge available if a person is having trouble self-navigating through the space.

In terms of material selection, HDR worked within established standards. Suhar notes, "Kaiser Permanente as an organization has been a leader in environmental sustainability of buildings. They have a tremendous robust research group, including in-house design that has compiled a material list that A&D can reference, which includes everything from types of flooring through furniture. They have tested the materials on the list.

"This has not been limiting. It is nice to work with a client that has done such due diligence on the tools that we work with. Product selection can pose a liability for an A&D firm. And flooring is the biggest investment of materials for any owner, in terms of the product, installation and actual maintenance of it."



Unicork's cork flooring sets the tone for health exploration in Kaiser Permanente Chino Grand's Thrive Bar.

Designers have more flexibility on color, developing their palettes in response to the Kaiser Permanente brand, which Suhar describes as vibrant and active. Spaces throughout the building are energized with punches of color. Colors are also used for wayfinding.

Linoleum—Harmonium by Tarkett's Johnsonite and Forbo Marmoleum in a range of colors—was specified for all exam and clinic areas based on its sustainability attributes. And flooring for the public square is a combination of porcelain tile and cork. Cork—Zuma Walnut from Unicork—is installed in the Thrive Bar, a place where patients can receive no-cost advice from experts on nutrition, exercise, and other wellness issues. Flooring in the main public square is Shades by Crossville porcelain tile in a 24" square format. And Shaw Contract's Overlay and Laser Cut 18"x36" plank carpet tiles are installed in doctors' office spaces adjacent to the clinic.

The interior design expands to outside areas, linked by related flooring materials. For instance, a community room with a teaching kitchen is located adjacent to one patio, where the flooring pavers outside are intended to be an extension of the indoors. HGA is in the early research stage of designing continuous indoor/outdoor facilities. It's a trend supported by the trend among porcelain manufacturers to produce expansive ranges of outdoor pavers. ■



Kaiser Permanente Chino Grand's lobby features Shades, a porcelain tile by Crossville.