



EDAC Champion and Advocate Firm Projects
EVIDENCE-BASED DESIGN
IN PRACTICE
2017

Evidence-based design (EBD) is the process of basing decisions about the built environment on credible research to achieve the best possible outcomes. EDAC Champion and Advocate Firms take an additional step, ensuring their healthcare teams become EDAC certified and actively incorporate EBD in their healthcare projects. Each of the projects highlighted in the EDAC Advocate Brochure describe how the evidence-based design process was applied to address challenges in their projects.

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To become an Advocate Firm, contact edac@healthdesign.org

Become EDAC certified.

Evidence-based Design Accreditation and Certification (EDAC) assesses your knowledge of the evidence-based design (EBD) process and its application in the design and development of healthcare environments. This educational program teaches you how to find, use and create relevant research to improve healthcare outcomes and add to the knowledge base of EBD.

Since its launch in 2009, more than 2,100 individuals worldwide have obtained the EDAC credential. Currently, 49 industry organizations endorse the program. Champion Firms participated in the beta testing phase and were the first to commit staff to take the exam. Advocate Firms dedicate a minimum of 25% of their healthcare teams to become EDAC certified.

The evidence-based design process includes eight steps:

- 1 Define EBD Goals & Objectives
- 2 Find Sources for Relevant Evidence
- 3 Critically Interpret Relevant Evidence
- 4 Create & Innovate EBD Concepts
- 5 Develop a Hypothesis
- 6 Collect Baseline Performance Measures
- 7 Monitor Design & Construction
- 8 Measure Post Occupancy Results

EBD STEPS APPLIED:



Overview: Our Lady of the Lake Regional Medical Center's (OLOLRMC) new Heart and Vascular Institute and emergency services expansion was designed to advance and redefine the field of heart and vascular care for the community by offering innovative treatments, state-of-the-art technology, education, and research.

Challenge: This project represented the first of its kind: a public-private partnership between the State of Louisiana, FMOL, OLOLRMC and Louisiana State University, along with statistically meaningful and proven outcomes to be met for patients and care team members at the bedside. Based on a series of agreements at the state level to provide medical education and community-based healthcare (including both incentives and penalties for non-compliance with timeframes, costs and services) the FMOL and OLOLRMC Board of Directors set expectations to provide a consistent level of premier care.

Solution: As the largest private medical center in Louisiana with multiple centers of excellence, along with a commitment to being "the safest hospital in the nation," it was imperative that a streamlined and effective process be upheld. To develop a care network for the most complex patients as well as preventive care in outpatient settings and provide emergency care services in the community required flexible thinking and a robust plan.

OLOLRMC's focus on patient safety, preservation of patient dignity, and reduced infection rates as key drivers resulted in the decision to apply known evidence-based design (EBD) strategies and resources and to research the results of newly implemented approaches. Strategies to improve outcomes in surgical and inpatient environments included:

- Within the surgical services area, provide private prep/recovery rooms with

Goal

To build a cardiovascular hospital that is both technologically superior and exceptional in its capability to support patients and promote family comfort and caregiver satisfaction. Specific goals defined by the team, administrators, and designers included:

- 1) create a patient- and family-centered environment;
- 2) improve the quality and safety of healthcare delivery;
- 3) support care for the whole person, enhanced by contact with nature and positive distractions;
- 4) create a positive work environment;
- 5) design for maximum standardization, future flexibility, and growth.

dedicated toilet rooms to decrease infection-related issues and boost patient and family satisfaction

- Within the emergency departments, provide enclosed medication rooms with proper lighting and soundproofing to reduce medical errors
- Provide on-stage and off-stage areas for care providers to separate circulation pathways and reduce nosocomial infection rates
- Development of research tools to validate improved outcomes during post-occupancy reviews



Operational efficiencies were achieved through process improvement workshops in which Stantec's medical planning team partnered with OLOLRMC's Chief Nursing Officer and operations team to deconstruct processes and provide Lean solutions.

In the ICU department, a layered care team model was developed to improve patient care and observation as well as team interaction. Care team stations were developed to support 12-bed units, combined with two-care team stations for bedside observation of two beds. This was effective at supporting holistic care, as patients required less sedation and medication.

Results: The resulting Level 1 trauma center can accommodate the state's most intensive cases at a scale along with the critical care services that have been recognized as the 2015 ICU Design Citation by the Society of Critical Care Medicine, the American Association of Critical Care Nurses and the AIA Academy on Architecture of health as both humanitarian and highly functional. Results from OLOLRMC's trademarked Nursing Environment of Work Survey showed significantly reduced stress levels and interruptions, increased physical energy level, and increased organization of charts/documentation. This is a critical point of differentiation as OLOLRMC competes to attract and retain qualified team members.

The first post-occupancy evaluation (POE) conducted after three months showed initial satisfaction on areas ranging from patient experience, connection with nature, patient room size, and satisfaction with lobbies and lounges. The second survey completed after 12 months of operations showed improvements in efficiencies in operations as caretakers worked in their new environments.

HDR

Great Plains Health North Platte, NE

Great Plains Health, HDR/Dan Schwalm,
August 2015



Goal

To provide an innovative, eco-friendly state-of-the-art facility focused on caring, quality healthcare. A key to the project's success was establishing a shared vision and guiding principles and using those principles to guide decisions throughout the process. The principles included enhancing the patient experience, improving efficiency and safety, maximizing the project's return on investment (ROI), and promoting a team environment to support a higher degree of patient and staff engagement.

EBD STEPS APPLIED:



Overview: With HDR's creative vision "to create a sophisticated space with subtle regional influences," the Great Plains Health (GPH) patient tower addition in North Platte, NE focuses on the physical and emotional well-being of patients and their families, as well as that of caregivers and staff. Using evidence-based design (EBD) concepts, the facility is designed to offer a tranquil experience for visitors from the time they enter and throughout their visit.

Challenge: HDR was challenged to integrate the latest evidence, data, and Lean operational strategies into the five-story patient tower design within the budget. Because the client was shifting operations from a centralized to a decentralized care model, it was critical to go beyond design services and incorporate specialty consulting services. This included transition planning along with signage and wayfinding, to help ease the challenges of the transition. The goals of increasing staff efficiency and improving the patient experience were informed by existing evidence and incorporated specific EBD strategies.

Solution: In the beginning, the client was concerned about patient units increasing in size and the impact on day-to-day operations. An HDR staff travel study demonstrated that even though the footprint was increasing, the decentralized design meant that walking distances would not increase. Mockup patient rooms were built and tested prior to construction to ensure the decisions made were functional and efficient. More than 40 changes to the mockup rooms translated to a more flexible design that also created cost savings during construction.

The design team and client toured other facilities that were using design strategies proposed by HDR. The client was able to see those applications in action and understand the implications for their own operations.

User-group meetings and community visioning sessions also influenced planning and design. The hospital design included community gathering spaces, and HDR and GPH sought input from community members throughout the design process. The team also gathered input on the bed tower design from regional representatives, comprised of administrators and doctors in surrounding communities.

EBD strategies included in the final design are:

- Views of nature
- Exposure to natural light
- Decentralized nurse stations
- Improved placement and number of hand-washing sinks
- Large, single-bed, standardized, same-handed, conversion-ready patient rooms

Results: Data was collected in the existing facility using "Time Study RN," a PDA handheld-based study with data compiled from nursing staff. The PDA alerts the nurses at random intervals to indicate their location, what task they just completed, and what task they are currently completing. This was used to track clinical behaviors, including value-added and non-value-added time. Results were compared to national benchmarking standards, and design strategies were implemented to increase value-added care activities.

The design team hypothesized that building acuity-adaptable patient rooms and moving from a centralized to a decentralized care model would improve staff efficiency and engagement. The next steps include a post-occupancy evaluation (POE) to measure how well the building is supporting employees' needs. HDR also will conduct a study of the decentralized nursing model to study the impact of the change on nurses' communication and satisfaction and on patient outcomes. A similar hospital site will be used to compare outcomes from both the POE and decentralized nursing study.

EBD STEPS APPLIED:



Overview: The 78,600-square-foot Cottonwood Clinic was designed to reflect Intermountain Healthcare's values and streamline processes to enhance the patient experience. The facility includes seven clinics: internal and family medicine, endocrinology, rheumatology, podiatry, pain services, and Murray InstaCare and Cottonwood Pharmacy in a single accessible location. The inspiration for the interior design was the diverse colors and textures of the natural Utah landscapes: aqua blue, desert gold, forest green, and sky blue.

Challenge: The team used an integrated Lean design approach to the facility's program and design. This process involved developing an interdisciplinary, cross-functional team comprised of physicians, nurses, medical assistants, laboratory and radiology technicians, pharmacists, social workers, dieticians, and facility staff and management. Collaborating with ZGF, the contractor, and clinic leadership, the team focused on Intermountain Healthcare's number one core value: do what is right for the patient. Using five multiday Integrated Design Events over five months, the team made decisions to target operational and facility outcomes in support of the project goals. Key outcomes that were targeted include: increased efficiency, reduction of non-patient care space, maximized building square footage on-site to incorporate growth, improved patient satisfaction scores, improved current call abandonment rates, reduced number of days for an appointment, and improved wait times. Full-scale mockups were assembled and tested by caregivers who would actually use the spaces.

Solution: Designing this new multispecialty clinic for an established healthcare provider afforded an opportunity to rethink the clinical care model by implementing significant operational, workflow, and cultural changes within a patient-centered environment.

The design provides distinct care team and patient zones. The concept utilizes distinct partitions to separate patient and visitor paths of travel to minimize interruptions and help ensure patient privacy. Improvements targeted key metrics such as reducing lead cycle time to shorten patient visits, grouping common patient flows to overlap support, and designing performance specifications for common patient flow.

Sustainability features included:

- Pedestrian and bicycle access by providing a bicycle storage area and tree-lined walkways that assure a safe and secure path
- Pervious (landscape) areas to reduce storm water

Goal

To combine Lean, sustainability, and evidence-based design (EBD) to create a patient-centered facility designed to eliminate waste, improve workplace efficiencies, and minimize environmental impact. Systems were implemented because they were found to improve patient comfort. This was a LEED-Silver registered project as well.



Core team space demonstrating on-stage and off-stage.
Halkin Mason Photography, March 2016

- Permanent shading devices and automatically actuated shades to reduce solar gains
- Use of natural light and daylighting controls to reduce energy use
- Occupancy sensors and overrides to turn off lights when there is adequate natural light
- Use of finishes to reduce VOCs
- Low-flow fixtures to reduce water use
- Reflective roofing to reduce heat gain

Results: The project produced positive results within the clinic's first few months of operation. Patient wait times have been reduced; patients now check in at a centralized station on each floor. Staff at check-in desks are not required to answer phone calls (which are being routed to the Patient Service Center). Standard rooming activities and Intake are performed in exam rooms. Services such as blood draws are performed during the patient exam by staff and taken by runners to the laboratory; results are sometimes reported before the patient exam is completed. Separating staff and patient circulation also contributes to faster and more efficient appointments.

Intermountain Healthcare hopes to use this clinic as a standard for future projects throughout the organization. Achievement of this clinic's goals has been so successful that Gemba walks (personal observations of work of the clinic) are underway to illustrate how integrated design using Lean and EBD can improve target outcomes. Interim post-occupancy evaluations (POEs) are being conducted to track patient satisfaction, with plans for a comprehensive one-year post-occupancy survey.

Huelat Davis

MI2 MedStar Institute for Innovation
Washington, DC



Goal

To develop a space that would act as a branding space that embodies MI2's mantra to "think differently" and would also serve as an incubator for new ideas.

Small: Innovation Lab Collaboration, MedStar MI2, 2015
Main: Rendering of Innovation Lab, Huelat Davis Healing Design, 2015

EBD STEPS APPLIED:



Overview: MedStar Institute for Innovation (MI2) is a broad innovation infrastructure that supports 30,000 associates and 6,000 affiliated physicians. MI2 wanted to create a place where "innovation" could support creativity and "out-of-the-box thinking" for healthcare leaders within the MedStar system. The result is an "Innovation Lab" within MI2 that advances health through innovation and is part of an interior remodel project.

Challenge: Today, if a healthcare system does not have an "Innovation Institute" or "Center for Innovation" somewhere in its organizational landscape, it risks appearing to be behind the curve and lacking sufficient long-term focus. The challenge was to explore what an innovation center within a healthcare system actually does. Because these centers are relatively new, they can perform many functions, alone or in combination with others. Relevant and credible literature suggested many different potential roles, all of which are focused on advancing health through innovation. They include:

- Commercializing new devices, software, diagnostics, and therapeutics created by employees
- Sponsoring and facilitating performance improvement innovation in the processes of care
- Piloting and incubating projects for new care delivery systems and business models
- Catalyzing a culture for innovation across the organization
- Serving as an entry portal for startups to access and navigate the broader healthcare system
- Identifying, setting up, and incubating new endeavor domains for the organization

- Consulting with operational units to find new approaches to solving difficult problems

One way to think about these innovation centers is as internal startups embedded within the larger organization, one that serves as an attractor for the high-energy, future-focused, and "change-the-world" optimism that pervades startup culture.

With this in mind, the greatest challenge was to identify a creative philosophy and approach to the design that would work for a great diversity of users and provide a quiet, meditative, and mindful space while supporting collaboration, networking, and brainstorming.

Solution: The design solution is a "stage set" for critical thinking and visionary work. The offices are gathering spaces that spark creativity and support collaboration for top thinkers in healthcare delivery. MI2 consists of two wings connected by a light-filled atrium. The wings house workspaces to cocoon and allow ideas to percolate. At the heart of the center the Innovation Lab features flexible collaboration spaces and provides a setting for impromptu conversations to transition into brainstorming sessions and informal meetings where ideas can solidify.

Furnishings form the anchor for creativity within this environment. Flexibility is the catchphrase of the creative environment that desires to flex between bursts of collaboration and quiet periods of cocooning. These time-tested furnishings can be stacked, folded, bent, rearranged, or nested. Chairs can serve many purposes. Rather than forcefully scripting how work should be performed, this office allows members to create their own unique stage set for each act of the performance.

Nature has restorative effects such as lowering blood pressure, contributing to a positive emotional state, lowering levels of stress hormones, and boosting energy. This new space features full-spectrum light and energetic colors to encourage movement and inspire fresh thinking. Carefully placed colors form wayfinding cues and become markers of place, with natural, organic patterned carpet throughout the space.

Results: Findings from the literature include:

- The health benefits of biophilia
- Research and design principles for mindfulness
- Findings from the neurosciences about quality of place
- Nature and benefits of innovation
- Collaboration models
- Creative experience

A post-occupancy evaluation (POE) will be conducted in Fall 2016 and findings will be published.

EBD STEPS APPLIED:



Overview: The Parkwood Institute Mental Health Building in London, Ontario was designed and constructed in conjunction with the Southwest Centre for Forensic Mental Health Care (St. Thomas, Ontario) to deliver full-service mental healthcare to southwestern Ontario. With 168 single-bed inpatient rooms, the new 450,000-square-foot facility provides both inpatient and outpatient programs, including geriatric psychiatry, dual diagnosis, treatment and rehabilitation, assessment, and adolescent psychiatry.

Challenge: The geriatric client population is at higher risk of developing mental disorders, neurological disorders, or substance abuse problems, in addition to physical deterioration and mobility impairments such as diabetes, hearing loss, and osteoarthritis. This study focused primarily on the design of a safe and secure room for geriatric mental health clients and effective methods to reduce falls.

The primary challenge centered on the design of a single-patient room type that would exceed the care requirements of the patient population. Goals included:

- Removal of hazards or barriers in the room to encourage patient independence and recovery
- Flexibility to accommodate the needs of each patient population
- Safe and secure environment for staff, patients, and visitors that minimizes the potential for harm to one's self or others
- Patient bedrooms that replicate a homelike environment

An additional challenge arose from the client requirement to locate the patient washroom at the entrance to the room, which reduced the field of visibility from the patient room entrance door.

Parkin's peer-review of mental health bedroom layouts studied room types under five headings:

- Flexibility
- Connection to daylight and the exterior
- Reduction of hiding (person or contraband) opportunities
- Minimized potential for harm to oneself or others
- Ease of washroom access

The review informed the first design move: to angle the washroom wall to broaden the field of vision from the entrance into the room.

Furniture layout evaluations prompted locating the bed in clear view of the patient room door; however, patients would have to traverse the room from

Parkin Architects Limited

The Parkwood Institute Mental Health Building
London, ON, Canada

Goal

To embody integration and openness, to provide a safe and welcoming environment for long-term mental health patients, and to promote healing and independence for patients in their recovery journeys.



Patient room with built-in furniture, bed located in clear view of the entrance. Angled washroom is located on wall on the right. Studio Shai Gil, November 2014.

the bed to access the washroom. To minimize fall risk, a handrail was installed connecting the bed to room entry, reducing the length of unsupported patient journey.

Further reviews of slip resistance and cleanability informed choices of linoleum flooring in the patient room and seamless resin for the washroom. Similarly, nightlights were located close to the door of the room for safety, while minimizing sleep disruption.

Results:

Parkin performed a post-occupancy survey to ascertain the success of the patient bedroom and washroom design in reducing patient falls in the geriatric psychiatry units. Results were largely qualitative, with respondents encouraged to provide comments and descriptions of their experiences, as well as any pertinent patient feedback. Staff responses were measured on a 5-point Likert scale. Sixty-five percent of respondents rated the success as 5 (very effective), with an average of 4.5 (effective-very effective). Staff responses confirmed that patients used the handrails for support.

At the time of the survey, no patient falls had been recorded. While it is most likely that measures implemented have increased patient safety, due to the limitations of the study and reliance on anecdotal evidence, there is no direct correlation between the safety measures implemented and the prevention of patient falls.

Parkin Architects Limited, (in conjunction with Saleh Kalantari, an Associate Professor at Washington State University), carried out a POE survey at both the Southwest Centre for Forensic Mental Health Care and the Parkwood Institute, Mental Health Care Building. The team completed the data analysis phase and anticipate the Journal paper detailing findings to be published in the near future.

Skyline Art Services

The Nephrology Department at Children's Health
Dallas, TX

EBD STEPS APPLIED:



Overview: A 24,000-square-foot pediatric nephrology department on two floors of a large hospital complex is designed to be a warm, inviting space with positive distractions of artwork depicting animals in nature. The artists were commissioned to provide featured elements within the overall design. In particular, pediatric nephrology patients return to the center often, for treatments that can last for hours at a time. They must be provided with an environment that supports repeated engagement.

Challenge: An immersive environment must be both visually engaging and durable for busy spaces like waiting areas, corridors, individual patient rooms, and a large common dialysis center. Each time a patient visits the nephrology unit, they should be able to find something new to offer a positive distraction. Additionally, evidence suggests that pediatric patients have very different art preferences depending on their age. A successful installation should appeal to young children as well as adolescents and those entering young adulthood.

Solution: Artists were commissioned to create a series of wall murals that were translated from digital scans into printed floor-to-ceiling wall coverings. The artworks feature scenes of nature that are lively and bright to appeal to younger patients. The scenes are also sophisticated and rich with detail for adolescents and young adults to enjoy. Because of the artists' attention to detail and the reproduction process, the mural images retained the look of their original medium: layered painted paper collages. This medium and style set the standard for the carved animals and other graphic designs in the unit. The animal subjects and habitats also provided casual opportunities for patients to learn fun facts about biology and ecology around the world.

The large dialysis center features 17 separate stations, each with its own designated animal and habitat, corresponding to an alphabetic signage system, starting with A for "Armadillo." Each has unique features and dimensions. The artists provided vector drawings of a habitat for each animal, integrated with the overall palette and finish specifications. The wall of each station is adorned with a painted animal carved out of a medium-density fireboard wood, creating a dimensional visual highlight for the station. Educational panels in each bay provide information about each animal and its habitat.

The result is a cohesive environment that identifies the nephrology department as a unique place within the hospital system, with visual interest and surprising details that support the patients' repeated engagement.

Results: To provide the maximum opportunity for positive distraction in a clinic space characterized by repeat visits and long periods of patient immobility, an art



Goal

To create an environment that supports repeated engagement and provides opportunities for positive distraction for pediatric patients who repeatedly visit this unit, many for regular kidney dialysis treatment.



Top: Dialysis, Skyline Art Services, 2016
Bottom: Main Lobby, Courtesy of HKS, 2016

program was devised to support repeated patient engagement. Richly detailed wall treatments with layered complexity and surprising details were created to appeal to pediatric patients on each of their visits. The subjects of these murals – animals in their habitats – were done in a style meant to appeal to a wide range of preferences from the various ages and expectations across the patient population.

While research has indicated that pediatric patients prefer different styles of artwork depending on their ages, a descriptive analysis has not been done to identify qualities of visual art that might appeal broadly to a range of ages, including adults who accompany and care for these pediatric patients.

EBD STEPS APPLIED:



Overview: Anchored by oncology services, the intent of the two-story ambulatory center's design is to support and uplift patients, families, and staff. The "Compass of Meaning" theme utilized in the facility is symbolic of the patient's journey through treatment and embodies the mission of the AMITA Health System.

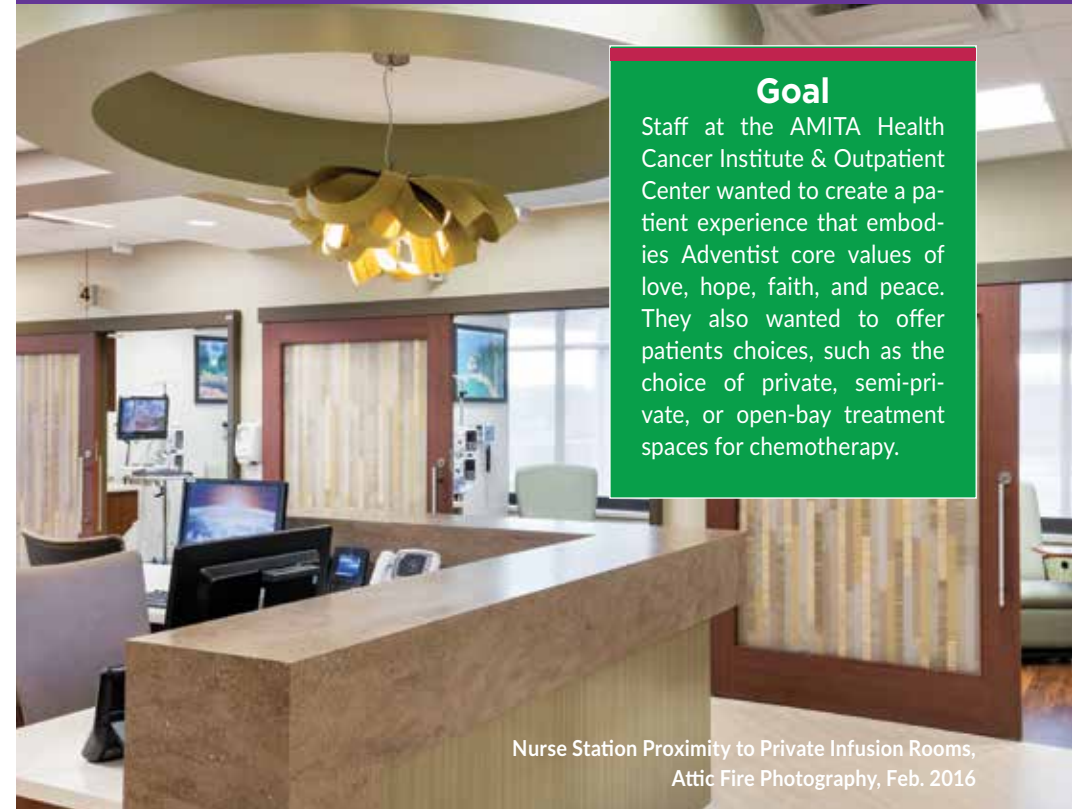
Challenge: The first challenge in the design of this facility was to create an environment that provides choices for infusion patients beyond the traditional open bay for chemotherapy patients and how to configure the choices of spaces to best support these patients.

Another challenge was to create ease of wayfinding to separate the various types of services and spaces the center offers. It was crucial to keep patient paths simple and intuitive to assist patients and their companions in locating oncology, radiology, and outpatient imaging. This also involved creating distinct, dedicated entries for both oncology and outpatient populations.

Another challenge was how to plan the building and its positioning on the site to take advantage of the surrounding natural elements and bring natural light into areas that traditionally have not had this access, such as the linear accelerator vault.

Solution: The design team conducted initial research and presented this information to owners and key leaders. Recognizing that cancer treatment is a journey, the team worked with Starizon Studio to help think through this experience. The team went on field trips and looked at other industries, e.g., Apple and American Girl. The owner and design team conducted focus groups of current patients, cancer survivors, and family members. Community and patient input led to the design of 17 private infusion spaces, four semi-private spaces, and an open-socialization grouping of seven infusion positions. As a result of these discussions, the center design evolved with the creation of "living rooms" versus "waiting rooms." The community and patients were given the opportunity to convey their ideas about furniture and artwork options, with selections based on the elements of healing, spiritual aspects, and uplifting design.

Wayfinding starts with appropriate signage for two distinctive entry points onto the campus, one each for the cancer institute and outpatient imaging and radiation oncology patients. Wayfinding also makes visual connection to the outpatient imaging lobby area. The compass design on the lobby floor has ribbons in representative colors flowing from the compass to the appropriate destinations.

**Goal**

Staff at the AMITA Health Cancer Institute & Outpatient Center wanted to create a patient experience that embodies Adventist core values of love, hope, faith, and peace. They also wanted to offer patients choices, such as the choice of private, semi-private, or open-bay treatment spaces for chemotherapy.

Nurse Station Proximity to Private Infusion Rooms,
Attic Fire Photography, Feb. 2016

All public areas have access to natural light and calming outdoor views. The eight-acre setting includes a natural forest preserve along the eastern edge of the campus, walking trails and healing gardens. A pond provides both a water feature and storm water management. All private infusion rooms have windows with views to the natural setting. A healing garden with a courtyard wraps around the exterior of the open infusion area.

Results: The facility opened in March 2016. An executive with the health system reports that growing volumes of patients are embracing the new facility, with most infusion patients preferring the private and semi-private infusion rooms over the larger communal space. A post-occupancy evaluation (POE) will be conducted in six to eight months to study the room choices and whether demographics or where the patient is in their treatment journey influence their decision.

HoodenPyleGil (HPG) and CAMA

Leeway: Designing and Implementing a
Community Living Model
New Haven, CT

EBD STEPS APPLIED:



Overview:

Leeway, a respected nursing home pioneer in New Haven, CT and other stakeholders are working together to create a Community Living Model that will provide health services to individuals living with multiple chronic illnesses. Leeway facilities and support services include skilled nursing facilities, residential care housing, supportive housing, and independent living. The company was recently awarded a grant by the Connecticut Department of Social Services (DSS) to diversify its services. This project aligns with existing city and community efforts as well as state efforts to support an individual's capacity to thrive and flourish within the City of New Haven. The project emphasizes personal empowerment through health literacy and coaching and prepares individuals to successfully return to the community after hospitalization by extending multidisciplinary care management services.

Goal

To support personalized positive change for individuals living with multiple chronic diseases by transforming the way care management services are delivered and how health and wellness services are integrated in the community.

Challenge:

The challenge is to decrease hospital discharges to nursing facilities by 1.5 percent and to contribute to the statewide goal of transitioning 8,000 people from nursing facilities to the community by 2020. This challenge shifts the care and support individuals receive at two distinct points in the medical intervention continuum. The first is at the point of discharge from the hospital. The second is in the daily life of the individual and the health and well-being options provided to them as well as the transfer of information to access these services. Additional challenges include broadening and building relationships across siloes, working with partner organizations to contribute to their ongoing initiatives, avoiding duplicative services and support, and achieving system-level change.

The first step in addressing these challenges has been to pose a question to the community: "What could the time between medical interventions look like so that it is filled with a supportive, reliable, and loving social network; healthy options that support the mind, body, and spirit to thrive; and a safe place to call home?" The goal is that the community, stakeholders, and partner organizations will address this challenge together by increasing choices for the individual while expanding the existing continuum of long-term care services and support.

Solution:

The team addressed the challenge at all levels and through all stages of the project. One key objective is to develop Places of Dynamic Services that encourage healthy living through personal growth as well as foster security.

Time Between: Cama, Inc., June 2016

What could the time between medical interventions look like?

Supportive, reliable, and loving social network; healthy options that support the mind, body, and spirit to thrive; and, a safe place to call home.



Place of Well-Being



Places of Dynamic Services (PODS)



The vision is to design and build a Place of Well-Being that serves as a one-stop shop for individuals with multiple chronic illnesses.

The premise is that stakeholders can accomplish more by building on collective strengths. To support this view, "Appreciative Inquiry" is the methodology utilized that recognizes the full worth of something or someone and discovers possible solutions through questions. Appreciative Inquiry is strengths-based, artful in its search, collaborative, inclusive, and generative. The methodology moves through four phases from discovery to dream to design and finally to destiny.

Results:

During initial interviews, participants shared stories of what aspects were working well. The main questions revolved around the strengths of each partner organization, their well-being, the community and connections, and the dream of a Place of Well-Being. The strengths of Leeway were identified through the voices of staff, residents, alumni, and case managers. Individuals who live with multiple chronic illnesses in the community were then interviewed. Powerful themes emerged, including that an individual with multiple chronic illnesses could be any one of us, and how would we want to be treated? It's important to be seen and accepted for who one is and to have a sense of belonging; this is the key to receiving dignified treatment and compassionate care.

A living storybook was developed to record the changes and steps taken, questions asked/to be asked, sticky problems, and successes along the way. Vignettes and photographs are scattered throughout. The storybook represents the collective voice of individuals, organizations, and the community.

EBD STEPS APPLIED:



Overview: Designing the University of Minnesota Health Clinics and Surgery Center (CSC) provided the facility an opportunity to rethink care delivery models, evolve the brand, and reduce the cost of care to meet future healthcare demands. As a destination ambulatory center, the CSC is designed to elevate an inter-professional care delivery model while providing an entirely new type of patient experience.

Challenge: University of Minnesota Health wanted the CSC to be a catalyst for the complete transformation of patient care. The model would fully leverage the collective knowledge of every member of the patient care team from doctors and nurses to pharmacists, social workers, dietitians, therapists, researchers, and students. An innovative workspace (the "collaboration space") was envisioned to empower these teams to work together in new ways – teams of caregivers and researchers performing the full spectrum of care-related activities and multidisciplinary teams collaborating, reviewing and editing patient records, discussing specific cases, and teaching residents.

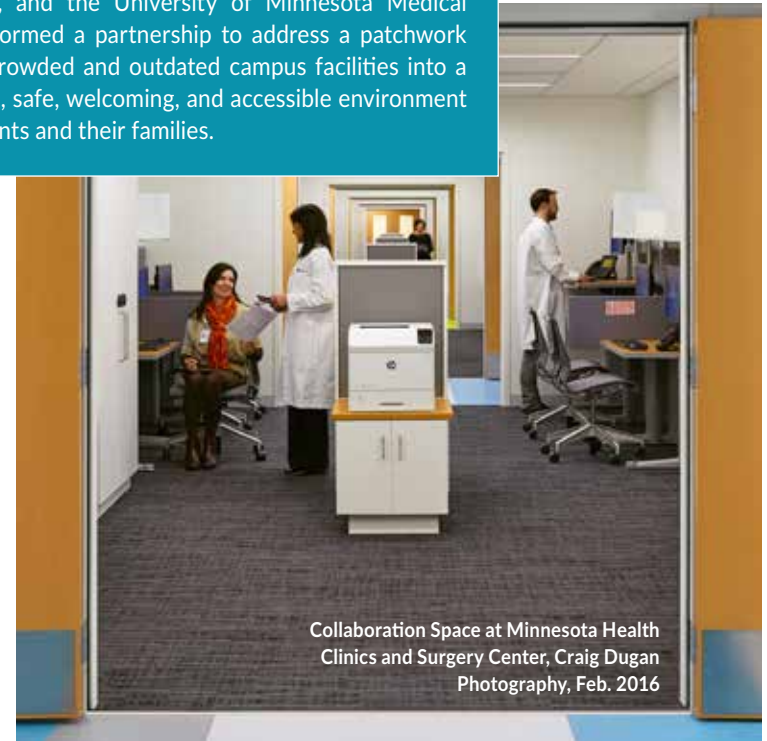
CannonDesign conducted literature reviews from a wide range of sources about workplace design and collaborative work environments. Much of the research was specific to corporate work environments as there was little information about them in healthcare settings, with the exception of a few articles. To meet the project's specific acoustical requirements the team worked with an acoustical consultant for advice on how to address these issues in the space.

Solution: Because the collaboration spaces were meant to serve as the primary work areas for clinicians and staff, it was important to ensure that design of the spaces was in line with user needs and preferences. The team was interested in learning not only how they would use the space provided, but also about the specific space layouts, what furniture and accessories would be like in the space, and how much storage there would be. Various solutions were selected and used as the basis for the mockups. A mockup collaboration space was created. Over 200 staff and physicians were invited to use and experience this space over a one-week period by simulating activities in the space and then evaluating key components through an online survey.

Results: After synthesizing and analyzing the survey data, the team reported key findings back to the client, including: the anticipated frequency of both in-person and virtual collaboration in the spaces, acoustics and privacy

Goal

University of Minnesota Physicians, Fairview Health Services, and the University of Minnesota Medical Center formed a partnership to address a patchwork of overcrowded and outdated campus facilities into a cohesive, safe, welcoming, and accessible environment for patients and their families.



Collaboration Space at Minnesota Health Clinics and Surgery Center, Craig Dugan Photography, Feb. 2016

observations related to the flexible configurations, layout and storage options, and preferences related to privacy screens, adjustable desk heights, task lighting, virtual collaboration tools, and aesthetics and quality of materials used.

CannonDesign developed recommendations for the collaboration spaces that reflected the stated layout preferences, provided the desired storage, and increased the number of users that can be supported in the space at a given time. The mockup collaboration space also revealed staff anxiety over working differently in a new space. This factor led to a recommendation for further education of staff and physicians about operations of the new space, and a transition planning process to help users adjust to the new environment. Baseline information has been collected related to patient satisfaction, employee engagement, and throughput data for all clinics. This information formed the basis for the design solution and will be evaluated when a post-occupancy evaluation (POE) is conducted later this year.

EBD STEPS APPLIED:



Overview: HGA developed a tool to evaluate the effectiveness of strategies implemented in the design and planning of a new medical-surgical unit at St. Elizabeth Hospital in Appleton, WI. The tool was used to collect data during both the pre- and post- occupancy evaluation (POE) of the new bed tower and represents an ideal way to utilize research methods.

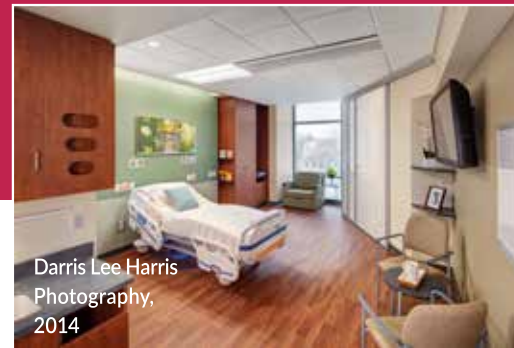
Goal

To align critical inpatient needs to produce Critical to Quality Outcomes (CtQs) for a new bed tower at St. Elizabeth Hospital using Lean process improvement. To create a research design tool that facilitates data collection and uses results from both parts of the study to inform the design process, and compare and report the results of the design decisions.

Challenge: The goal of Lean process improvement is to streamline care delivery and standardize workflows and to create a more productive work environment and safer care delivery. However, actions frequently are not taken to ensure that process improvement strategies meet a level of success. Studies and tools are needed to present how design research can play a crucial role in validating the significance of Lean impact.

Solution: The existing facility of St. Elizabeth Hospital, a member of Affinity Health System, was built in 1965. The replacement four-story bed tower opened in January 2015. This study focused on the medical-surgical unit on Floor 3 of the new tower. The new unit is approximately 21,000 square feet with a rectangular, single-loaded corridor and a 12-foot-wide central core. There are three “neighborhoods,” each consisting of five single-patient rooms on either side of the core (30 beds per floor). Each neighborhood core consists of a collaboration hub, medication room, clean supply and equipment room, soiled workroom, and equipment alcove. Patient rooms are approximately 320 square feet and have bedside charting, a pass-through supply server, hand sanitization station, toilet room with shower, and charting station with an observation window outside the door. The configuration of this decentralized unit configuration has two to three nurses assigned to each neighborhood.

Results: This project provided an opportunity to develop a series of measurement tools that allowed HGA and the client to create baseline measurement tools that were used again after occupancy to evaluate the success of both the Lean process improvements and the design decisions. This study applied a mixed-method approach using data from staff surveying, nurse shadowing, unit acoustic readings, and retrospective data collection, both pre- and post-occupancy.



Darris Lee Harris
Photography,
2014

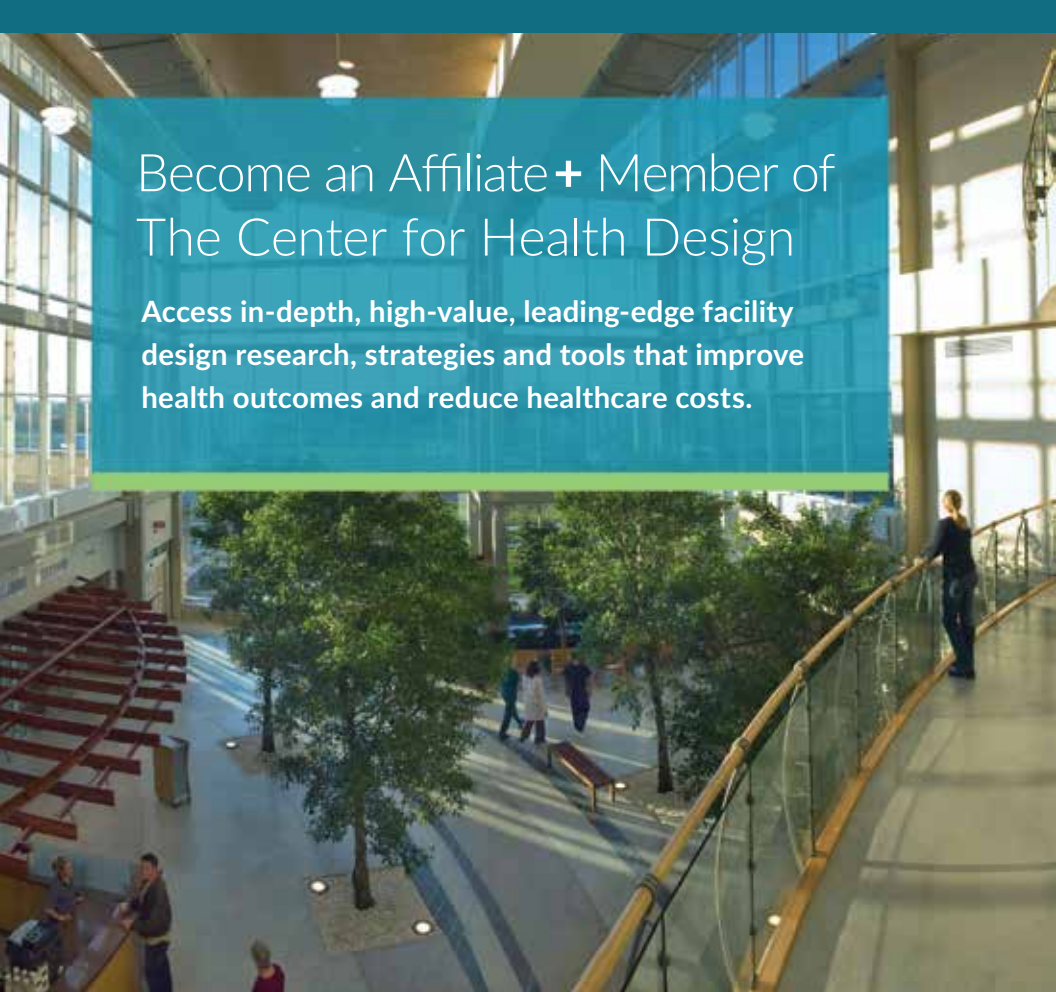
Final results showed nurses transitioning from a centralized care model where a majority of their

work occurred at the central charting station or at the workstations on wheels (WOWs) to a decentralized model where nurses worked at one of three designated collaboration hubs dispersed throughout the unit. In the baseline environment, approximately 75 percent of nurses' workflow paths involved stopping in the corridor to access WOWs, whereas the most common work path in the new environment was streamlined between the collaboration hub, medication room, and patient rooms. In addition, the overall unit and patient room designs had increased staff's perceived perception of work performance by 43 and 30 percent, respectively. Similarly, staff was significantly more satisfied with the overall unit design (up 26 percent) and patient rooms (up 24 percent). Unit layout and patient safety were predictor variables of unit and patient room satisfaction.

Clinical outcome measures for this facility will be evaluated in early 2017, when enough data has been accumulated for significant testing. Acoustical readings are being reevaluated following the addition of a white-noise system because of patient complaints that the unit was too quiet. The goal is to conduct this level of study on every design project, whether healthcare or another market sector.

Summary of Pre-/Post-Occupancy Research Design and Results

Inpatient Needs	Critical to Quality Measures	Research Methods	Pre-Occupancy	Post-Occupancy
Margin	• Average Length of Stay	• Retrospective Data	TBD	TBD
Time with Patients	• Time Spent	• Shadowing	41%	37%
Team Collaboration	• OR/ED to Admit • Staff Satisfaction • Patient Communication	• Retrospective Data • Staff Survey • NRC Picker	48% (corridor)	78% (Collab Hub)
Job Satisfaction	• Staff Injuries • Staff Satisfaction • Distance Traveled	• Retrospective Data • Staff Survey • NRC Picker	1.32 1.39 miles	1.37 (2=Very Satisfied) 1.41 miles
Quality of Care	• Medication Errors • Readmission Rates • Patient Falls • Pressure Ulcers • Healthcare-Acquired Infections	• Retrospective Data	TBD	TBD
Privacy	• Acoustic Readings • Staff Satisfaction • Patient Satisfaction	• Acoustic Readings • Staff Survey • NRC Picker	-0.14	0.54 (2=Very Satisfied)



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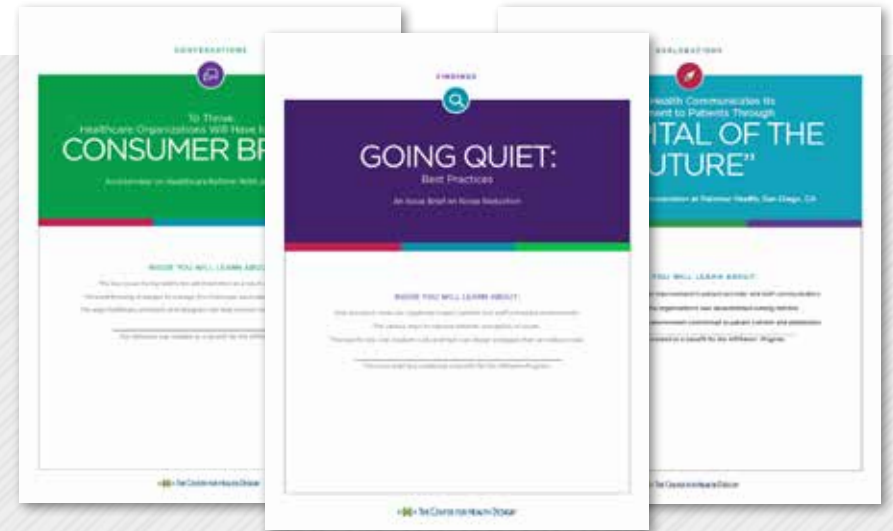
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