edac™

from The Center for Health Design

EVIDENCE-BASED DESIGN ACCREDITATION & CERTIFICATION

Become EDAC certified...

Evidence-based design is the process of basing decisions about the built environment on credible research to achieve the best possible outcomes. -The Center for Health Design

The Center for Health Design's internationally recognized Evidence-based Design Accreditation and Certification (EDAC) program certifies individuals who demonstrate a thorough understanding of how to apply an evidence-based process to the design and development of healthcare settings, including measuring and reporting results.

The evidence-based design process includes the following eight steps:

1. Define evidence-based goals and objectives.
2. Find sources for relevant evidence.
3. Critically interpret relevant evidence.
4. Create and innovate evidence-based design concepts.
5. Develop a hypothesis.
6. Collect baseline performance measures.
7. Monitor implementation of design and construction.
8. Measure post-occupancy performance results.

Who Should Be Certified?

- Architects & Designers – Develop design solutions that are rooted in research and linked to a client's goals and outcomes.
- Hospital Executives – Champion innovation that's good for the triple bottom line.
- Healthcare Providers – Integrate new ideas in healthcare design that align with organizational goals to achieve the desired results.
- Academics/Researchers/Students – Learn about this emerging discipline within the healthcare design profession and help carry the teachings forward.
- Engineering & Construction Professionals – Understand the importance of research-based design decisions and maintaining the integrity of these decisions during the engineering and construction processes.
- Product Manufacturers – Use research to inform the product development process and support improved outcomes in healthcare settings.

For the most up-to-date EDAC certification information, visit http://www.healthdesign.org/edac.

Your firm can become an Advocate for Evidence-Based Design...

EDAC has reached over 900 individuals and industry professionals with the help and support of our volunteers and industry experts. In 2008, during EDAC's exam development phase, our Educational Partner and six companies that we named Champion Firms, participated as beta test takers.

To continue growing our community, Advocate Firms partner with the EDAC program by dedicating a minimum of 25% of their healthcare teams to becoming certified. In return, we offer various platforms for Advocates to share EBD content and best practices via online newletters, social networking groups, and materials such as this booklet!

Educational Partner

Nurture by Steelcase

Pebble Project Pioneers

Provincial Health Services Authority
WellStar Paulding Hospital

Champion Firms

Kahler Slater
Harley Ellis Devereaux
Cannon Design
CAMA, Inc.
American Art Resources
Salvatore Associates

Advocate Firms

Anshen+Allen, a part of Stantec Architecture
B+H Architects
CBLH Design, Inc.
CEI Architecture
Cogdell Spencer ERDMAN
Cotter Architects
Czopek & Erdenberger, Inc.
Earl Swensson Associates
Gensler
Gresham, Smith & Partners
HDR Architecture, Inc.
Healthcare Art Consulting
Jain Malkin Inc.
Kasian Architecture
LEO A DALY
Parkin Architects Limited
Patrick Cotter Architects Inc.
Peters & Associates
Silver Thomas Hanley
T2 Designs, Inc.
Visions in Architecture
Wellness Environments Inc.

Read on to discover how these Advocate Firms are applying evidence-based design steps in their current projects.

Anshen+Allen,a part of Stantec Architecture

New Pembury Hospital, Tunbridge Wells, Kent, United Kingdom

ANSHEN+ALLEN
A part of Stantec Architecture

1: Define EBD Goals and Objectives
2: Find Sources for Relevant Evidence
3: Critically Interpret Relevant Evidence
4: Create and Innovate EBD Concepts

Goal:
To evaluate the impact of single bedrooms in the UK health economy, reduction of infection, improvement in patient recovery time and wellbeing from impact of nature views, natural ventilation, and reduced staff travel time. Pembury is the first Pebble Project in the UK, and the first NHS hospital, with 100% single bed wards. Affordable patient safety was the core guiding principle.

Challenge:
EBD research suggests that single rooms improve patient experience and well being. The team hypothesized that standardized patient rooms and "single-handed" design is better for reducing staff errors. EBD studies regarding 100% single-bed facilities reducing nosocomial infection were reviewed. Finding conclusive evidence on therapeutic/social value of single-bed versus multi-bedded wards was challenging, as the studies are affected by clinical specialties and cultural contexts variability. It was also challenging to extract clinical evidence measured on cumulative impact of multiple factors (patient's clinical conditions, mental/physical behavior) compared to measurable clinical individual factors.

Several 100% single-room ward designs were tested with Intelligence Space Consultants using surveys on work patterns in Leeds Nuffield Hospital, as well as Space Syntax Consultants' research on the Bevan Pilot Ward in Hillingdon hospital. This led to an optimized acute ward template, maximizing staff efficiency of travel and visibility.

Solution:
Pembury's standardized single-room has the following design characteristics:

- Bed-head placed in direct sight line from door with large vision panels
- Clinical basin at entrance
- Staff zone kept at entrance with bed-head unit on "clinical side"
- Large windows provide natural daylight and woodland views from patient bed
- Naturally ventilated rooms provide the patient control
- Bed-head on same side as en-suite bathroom door to reduce risk of falls
- En-suite door design allows ease of maneuvering and emergency access

The ward design is efficient, creating smaller sub-clustering of rooms, thus reducing nurse travel and maximizing patient visibility. All rooms have natural ventilation and external views (81 percent overlook woodlands).

The design reduced walking distances by 7.5km (/ward/12 hours) compared to generic single-bed wards and by 16.3km compared to Nuffield Hospital's 29 percent single-rooms L-shaped ward. Nurse-patient contact time increased by 2.8 hours (/12 hours) compared to generic wards and by six hours compared to Nuffield Hospital.

HDR Architecture, Inc.

Ft. Bliss Army Medical Center

El Paso, TX

2: Find Sources for Relevant Evidence
3: Critically Interpret Relevant Evidence
4: Create and Innovate EBD Concepts

Goal:
To create a world-class facility using evidence-based design (EBD), LEED, and patient- and family–centered strategies. The re-design of the Ft. Bliss Army Medical Center not only took into account the Military Health System (MHS) World-Class Checklist, but also information gathered from 14 EBD working groups to further influence the design.

Design topics included patient lifts, therapeutic gardens, hydrogen peroxide vapor cleaning/infection prevention, benefits of mock-up rooms, smart rooms, new technologies and best practices for flow of material/equipment/people, and the evaluation of antimicrobials with regard to patient and environmental safety.

Challenge:
The design team was challenged to use the MHS's World-Class Facilities Checklist, which contains EBD, sustainable, and world-class objectives and strategies based on relevant research and best practices, as a starting point for the design. Wanting to go even further with EBD and "personalize" it for this project, EBD working groups were formed to investigate different topics and to make recommendations based on credible research results. One of the patient and family-centered goals of the MHS is infection prevention. Specific project goals included reducing infection spread by ventilated air: The team evaluated enhanced air filtration methods, performance, pressure drop, first cost, replacement cost, and placement beyond minimum code. There was also a need to reduce the time and cost of cleaning contaminated surfaces. The team evaluated the use of hydrogen peroxide vapor cleaning effectiveness on MRSA, VRE, and C. diff and other super bugs. Internally ducted systems versus a portable system were both evaluated for first costs, maintenance costs, efficacy, and safety.

Solution:
The EBD working groups consist of subject matter experts from the A/E team as well as the client. Now in the design development phase, each group has conducted literature searches to find credible research and best practice results to inform their recommendations. Examples include:

- Additional patient lifts beyond those in the original program
- Mock-up rooms to further inform the design
- Expanded gardens and green spaces
- A MERV16 system (similar to HEPA but much more energy efficient and less costly)
- Limited use of antimicrobials
- Consideration of portable hydrogen peroxide vapor cleaning method.

Earl Swensson Associates

St. Anthony Hospital
Lakewood, CO

1: Define EBD Goals and Objectives

Goals:
During early programming phases, St. Anthony Hospital leadership made the commitment to use an evidence-based design process, and the following planning objectives were established:

- Clear patient wayfinding
- Distinct separation of inpatient/service flow versus public/visitor flow
- Patient access to clinical services
- Clear access to primary patient service entrances
- Staff operational efficiencies
- Reduction of falls and injuries
- Visibility across the patient unit within the support core.

Challenge:
It was important for the owner, design team, and project manager to agree on the goals for this project and to remain focused on these goals for the duration of the project. A contributing key factor was the completion of a "best practices" tour of notable new hospitals across the country to identify consistent themes being implemented, and gain feedback from staff in those facilities regarding what was working well and recommendations for improvement. The team worked together to protect key design concepts supporting the primary goals of the project. The pricing became challenging during project cost reduction discussions.

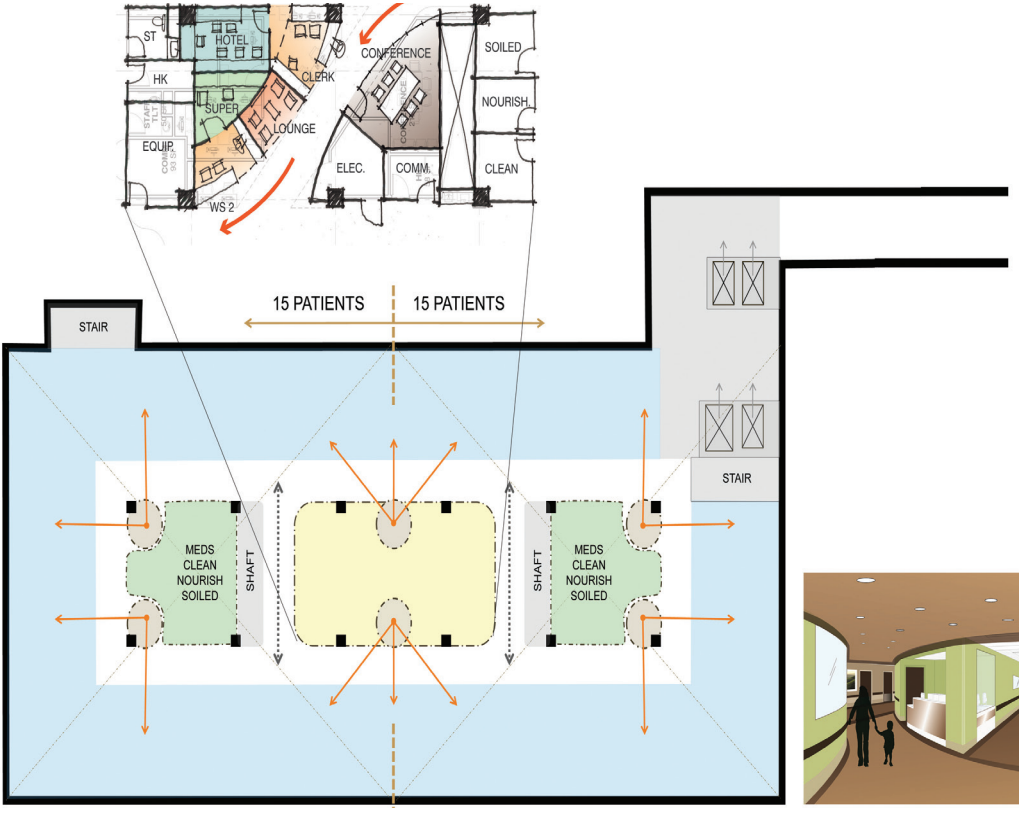
Solution:
The need for nursing and medical staff to see, find, and access one another was an important project goal. Engineers were challenged to minimize space needs in these support cores, which are typically full of mechanical chases, electrical rooms, and other opaque rooms that are difficult to see or pass through in patient wings. Consequently, the support zones in the new hospital are more transparent and accessible, and the majority of this space is reserved for nurse work zones and support spaces accessible at both sides, minimizing travel distances for staff supporting patient needs on both sides of the units.

Examples of EBD concepts supporting the project's goals and promoting patient and staff safety include:

- Grab bars between the patient's bed and bathroom
- Patient lifts above beds
- Consistent patient room and support space layouts
- View alcoves to patient rooms
- Bathrooms located on outside walls to bring in natural light
- Double doors to patient rooms for improved visibility and access
- Staff oasis rooms
- Depressed shower floor slabs to avoid potential trip hazard of shower curbs
- Automated vacuum system for transporting dirty linen and trash from patient care areas to the loading dock.

Harley Ellis Devereaux
Crittenton Hospital Medical Center
Rochester, MI

HARLEY ELLIS DEVEREAUX



1: Define EBD Goals and Objectives
2: Find Sources for Relevant Evidence
3: Critically Interpret Relevant Evidence
4: Create and Innovate EBD Concepts

Goal:
To improve efficiency, safety, and satisfaction for both patients and staff with the design of a new bed tower for the hospital, a place where patients get better and where staff wishes to work.

Challenge:
It was a challenge to plan the central core of the patient floor with everything needing to be centrally located. This challenge impacted outcomes in all three of the design goals. The further each room is from the center, the further a staff member has to walk to retrieve supplies, etc. which reduces staff satisfaction and the time patients have with their medical team.

Solution:
A project team consisting of staff and design members used a three-step process. The first step involved research on best practice and evidence, where it could be obtained, describing how other hospitals successfully dealt with these issues in nursing units. Those ideas that had been studied completely, such as access to staff lounges with windows (i.e. supports staff satisfaction/retention) were considered a must in the design. Other studies by Harley Ellis Devereaux and other architects that had not been completed to date were presented as opportunities for further study in a team workshop setting and early mock-ups.

Early mock-ups using simple, easily obtained materials were done within a large open space (vacant medical office suite). This was incredibly productive and aided the creativity in solving vexing issues. The third step was a review of the more detailed design of the unit and patient rooms in a team setting with deliberation involving physicians, nurses, and support staff to balance the costs and benefits of room placement and detail. This resulted in the creation of a ¾ finished patient room, which allowed the design team to refine details toward the goals.

A team of nurses and hospital administrators were determined to divide patient floors into two "units." There would be a duplication of medication, clean, soiled, nourishment, and decentralized workstations with a centralized equipment room and collaboration center. Priorities were developed based on which support services were most frequently used. Travel distances were reduced to approximately 25 feet from every room to key support services. The central collaboration center allows for a single place to communicate both professionally and socially, which helps reduce the feelings of isolation.

Cama, Inc.

Mid-Continent Regional Center for Health Care Simulation
Wichita, KS

CAMA

2: Find Sources for Relevant Evidence
3: Critically Interpret Relevant Evidence
4: Create and Innovate EBD Concepts

Goal:
To create highly realistic participatory learning experiences in an environment that does not involve an actual patient. This method of teaching is rapidly becoming a new standard in both primary and continuing education for health professionals. The intent is to improve learning experiences through improved personal and technical skills and interdisciplinary team communications in an environment designed and built around current evidence-based medicine, evidence-based practice and evidence-based design knowledge. The design team plans to launch innovation in the design of the physical environment by using baseline knowledge in all three of these methodologies to simulate best clinical practice in the field for students and advancing professionals.

Challenge:
Healthcare simulation improves clinical and technical skills, teamwork, patient safety, and communications. It is however, uncharted in the evidence-based design (EBD) literature. Much would be gained if the field offered more about improved communications, team learning or workplace efficiency for interdisciplinary medical teams in highly technical settings. Using knowledge about EBD clinical environments, these settings will be developed and designed as best practice environments with next practice technologies. How interdisciplinary teams learn and communicate will determine the success of these settings and contribute to the field as a whole.

Solution:
The project is in the gathering intelligence phase with concepts being rendered for ongoing fund development. The design solutions call upon EBD baseline data available for the design of progressive highly technical clinical practice environments and up-to-date on site and remote learning experiences. The opportunity exists to allow participants in these learning experiences to experience state of the art evidence-based design informed environments that help to improve outcomes and reduce risks of error while learning hands-on medical practice methodologies. This will set an expectation early in a clinical career to understand the role the built environment plays in the ease of care and the reduction of inefficient behaviors. This project aspires to be part of the Pebble Project research initiative and will contribute knowledge in areas still uncharted.

B+H Architects

Markham Stouffville Hospital, New Wing & Renovation

Markham, Ontario, Canada

Goal:
To strategically renew a 20-year old facility and maximize resources allocated to the new expansion while enhancing patient care and staff experience throughout both areas. To improve staff work environment and patient health outcomes through access to daylight and views, minimization of travel distances, and efficient patient room configuration and care stations.

Challenge:
Improving the patient and staff experience in inpatient units in both the existing and new structures required reviewing and implementing different strategies for each. Maximizing existing construction in the existing cruciform-shaped facility resulted in a focus on optimizing care station functioning. New construction allowed exploration of patient room configurations and centralized versus decentralized care station options. Good family / friend space was planned within inpatient rooms as well as a high efficiency staff convenience zone thereby allowing clinical procedures, hand washing and waste management to take place without impact to the inpatient room conversation space.

The existing hospital had a large quantity of natural light and views of nature in the inpatient units and corridors. With the expansion, the challenge was to optimize locations of daylight and views for spaces occupied for lengthier periods and to assist wayfinding without sacrificing travel times and distances for maximum impact on patient wellness. In the refurbished spaces, planning adjustments were made to improve workflow; materials and lighting were replaced to improve maintenance and infection control measures - all to ensure that the existing facility was not deemed “second rate” to the new addition.

Solution:
Utilizing and integrating inpatient-unit research, the design decisions made that best supported staff while maximizing patient care were mirrored inboard rooms, modified centralized care stations for the existing building and decentralized care stations in new construction, and choosing partially open care station configuration (with only reporting and team rooms enclosed) for all existing and new areas.

Daylight and views were integrated into the building design by allowing natural light into operating rooms through the use of interior glazing. Daylight and views are now emphasized in large and small communal spaces and also support wayfinding. Easily accessible, secure courtyards, a green roof and plantings, along with a newly constructed community and wellness centre are visible from the building’s interior, providing a sense of nature combined with a feeling of community.

Jain Malkin Inc.

Benjamin & Marian Schuster Heart Hospital
Kettering, OH

JAIN MALKIN INC.
5070 Santa Fe St. Ste.C
San Diego, CA 92109
www.jainmalkin.com
Tel: 858.454.3377

2: Find Sources For Relevant Evidence
4: Create and Innovate EBD Design Concepts
8: Measure Post-Occupancy Results

Goal:
To change a patient's hospital experience through specific environmental design features aimed at reducing stress.

Challenge:
The concept of EBD was new to many of the hospital staff, but they put aside their individual preferences for the good of the patient in order to reach their goals. Hospital leadership believed an EBD approach would facilitate positive outcomes in a patient's physical, emotional, and spiritual health and saw a benefit to the staff in the reduction of stress and fatigue. Prior to beginning design work, a literature review was conducted using numerous sources. The research platform was derived from the neurosciences, environmental psychology, psych neuroimmunology and well-established EBD best practices.

Solution:
Research found staff often associate higher noise levels with higher levels of stress and work interference (Bayo, Garcia, & Garcia, 1995; Norbeck, 1985). A hybrid layout, using decentralized charting stations outside patient rooms, and nursing "pods," along with a central nurse station provided quiet areas for individual work, yet maintained spaces for group interaction and mentoring. Nurses are afforded a glimpse of views to the outside through windows at each charting station. Patient sleep and staff accuracy were also improved through use of high-NRC-rated ceiling tiles.

Staff fatigue was considered when designing nursing units. Two studies showed that time saved from walking was translated into patient-care activities and interaction with family members (Trites et al., 1970). Regularly spaced supply closets reduced walking resulting in a decrease in fatigue and an increase in overall job satisfaction.

Stress can directly and adversely affect other outcomes. Unhealthy effects of stress are related to detrimental psychological, physiological, neuroendocrine, and behavioral changes associated with stress (Gatchel, Baum & Krantz, 1989; Ulrich, 1991). Positive imagery expressed in representational art and specific design features carried into patient care areas reduced stress levels for patients, families and staff. "Art has the ability to touch us deeply, and profoundly, in our most vulnerable moments" (Kathy Hathorn, 2008). Prominent feature walls in transitional corridors between lobbies and nursing units combined with auditory sounds of nature put visitors in a relaxed state of mind before encountering patients and staff.

The pre-design research and resulting design decisions had a positive effect on satisfaction surveys. Ratings from both patients and staff resulted in significant increases when pre-and post-occupancy data were compared.

Kahler Slater
Martha Jefferson Hospital
Charlottesville, VA

Kahler Slater
experience design

4: Create and Innovate EBD Concepts

Goal:
To design nurse servers and charting stations in patient rooms that would allow the caregivers to stay close to the patient's bedside. By reducing the travel distance required to gather supplies and equipment and walk to the nurse station to chart, nurses would have more time to provide direct patient care.

Challenge:
To help the users understand exactly how the new nurse server and charting station would function in the patient rooms, a full-scale mock-up of a patient room was constructed at each phase of design.

Solution:
The viewing window, the counter height and width, the phone and outlet height and locations, and lighting were some of the design features studied for the charting station. The custom casework design of the pass-through nurse server was examined to best accommodate the medication, equipment, supplies, and linens.

Both end-users and designers were able to experience exactly how the nurse server and charting station would look and function and they were able to see the implication of their changes after each design phase. Users brought actual supplies and equipment that would be stocked and they were able to make decisions based on how they fit and how they would access them instead of having to anticipate it. By testing the design in the mock-up, they reduced the number of changes that needed to occur during construction and had a better understanding of operational and functional changes that would be needed in response to the new built environment.

In addition to the full scale mock ups, a variety of flooring materials were trialed in the existing facility to help users make decisions about what materials to use in the new hospital. Carpets and sheet vinyl were installed in corridors to allow staff the opportunity to push gurneys on both materials, help them make decisions about where to use each material and experience how they might look and feel. Maintenance staff was able to create spills and test how cleanable and maintainable each material is before deciding where to use each material throughout the hospital.

Kasian Architecture

Jim Pattison Outpatient Care and Surgery Centre
Surrey, British Columbia, Canada

Goal:
To become a landmark facility for the delivery of outpatient services in Canada and a model of best practice and clinical integration for current and future residents of Surrey, British Columbia. To create an elder-friendly facility catering to the needs of Surrey's growing multicultural community.

Challenge:
Designed to LEED Gold standards, this centre incorporates both Lean and Evidence-Based Design (EBD) strategies. Completed three months ahead of schedule within the overall construction budget, this building is an innovative and effective example of a P3 Project (Public-Private Partnership) that created a flexible and adaptable centre that can expand over time.

Solution:
The centre offers over 50 different specialized health clinics and programs inside one building and new services that are not currently available in the Fraser Health Authority. It is equipped with over 100 exam and treatment rooms, 10 procedural rooms and six operating rooms. EBD strategies included are:

Tranquil Environments - The walls, ceilings and floors within the outpatient centre are specifically designed to absorb noise. Soothing 'sky ceilings' in the CT and MRI rooms give patients a sense of control over their environment.

Natural Light and Access to Nature - Post operative patients placed in rooms with abundant sunlight and adequate ventilation report less pain. Southerly orientation allows daylight to flood the public interior spaces.

Simplified & Consistent Layouts - Simplified circulation routes and visual cues facilitate intuitive way finding. The use of words or letters on signage is kept to a minimum and every floor has its own distinctive color palette to help patients and visitors find their way. The main reception area is visible from anywhere on the site, even from the parking lot. Express check-in kiosks are located throughout the building. Alternative language options are available.

Functional model for future growth - The layout of the site and modular design permits open-ended expansion for population growth and corresponding increase in average life expectancy.

Effective Infection Control - Traffic flows are segregated, based on the separation of patient, staff and material circulation routes with separate elevators for staff and patients.

The Jim Pattison Outpatient Care and Surgery Centre established a new direction in health care delivery for Canada, one that is more patient-centered with increased emphasis on prevention and education. The centre was awarded the 2011 Commercial Building Award for Excellence.

Visions in Architecture

Butler County Health Care Center
David City, NE

3: Critically Interpret Relevant Evidence
4: Create and Innovate EBD Concepts
5: Develop a Hypothesis

Goal:
The goals are to improve infection control flow patterns and to reduce surgery room turn around time.

Challenge:
With a surgery department that was built over 50 years ago with inadequate clean/soiled separation and flow patterns, the surgical nursing staff and the environmental staff have compensated for the inadequate physical conditions through excessive cleaning. This increased operating room turn around time to 2.5 times the national average, resulting in unhappy surgeons and poor financial performance. The challenge was to alter the perception of the nursing and environmental services staff to recognize that changes in the built environment can result in better work flow patterns. The culture of "who does what when" becomes ingrained in an organization and can result in resistance to change.

Solution:
The solution to this challenge was to create a virtual mock up of the new surgical rooms providing surgical booms, equipment, lighting and mechanical systems. The amount and location of storage within the room was shown. In addition, animated flow patterns were shown within the department depicting the movement of surgeons, patients, surgical nurses and clean and soiled materials. This allowed the surgical staff to observe each step of the process and to voice their comments and concerns. By placing the staff in virtual spaces, they can more easily understand the new processes and expectations. This exercise resulted in a commitment to reduce operating room turn around time by 150 percent and significantly improve the project return on investment.

The design architect used the HERD article written by Kirk Hamilton and others on the relationship between cultural change and design to form the hypothesis "Can image and video technology depicting the principals of evidence-based design be used to effect cultural change?" It is our intent to measure results based on surgical room turnaround time using current times as baseline and measuring the new surgical suite turnaround times and the new benchmark.

Cannon Design

Indiana University, Melvin & Bren Simon Cancer Center
Indianapolis, IN

CANNONDESIGN

4: Create and Innovate EBD Concepts
5: Develop a Hypothesis
6: Collect Baseline Performance Measures

Goal:
The goal is to conduct research that will:
1) identify the needs of cancer patients while undergoing infusion treatment;
2) develop potential environmental design solutions to fulfill the needs; and
3) validate significant environmental design strategies for infusion patient care and satisfaction.

Challenge:
Each year 1.5 million people are diagnosed with cancer in the U.S., the second leading cause of death. The influence of the built environment on patient care is well documented, although little research has been conducted regarding cancer treatment environments. Most research in healthcare design focuses on inpatient environments, however most cancer treatment is provided in outpatient centers. Hypotheses and findings focusing on inpatient environment may not be applicable to cancer treatment environments.

The team started from a descriptive study regarding patient needs, to form a meaningful hypothesis for design and research. To measure the post-occupancy results, a research methodology that included independent and dependent variables had to be clarified before proposing the research. There were limited methodologies regarding cancer care environmental research in review of the literature. The team was challenged to create meaningful variables to measure the results of cancer treatment. Outcome measures of outpatient cancer care are different from the measures of typical inpatient care, such as average length of stay. Specific data collection tools had to be generated for use with cancer patients, who may not be well enough to talk during treatment.

Solution:
From discussions within the team and healthcare professionals, a new dependent variable was identified: hope. Hope is defined as feeling positive about future treatments, which helps patients endure chemotherapy and maintain the willingness to continue the treatment. Fulfilling patient needs through supportive environmental design is thought to foster hope.

To develop the hypothesis, the team itemized current patient needs and the potential environmental support required to meet these needs. Focusing on infusion environment patient experiences, a pre-design study was conducted in five cancer centers from 2000 to 2007. Based upon a series of surveys, interviews, and focus-group discussions with 300+ patients, the team summarized that patient choice and control, privacy and social support, and positive distractions should be addressed within the design. In order to meet different preferences, the team hypothesized that an infusion center should have three types of treatment settings: private rooms, semi-open, and open areas.

Healthcare Art Consulting

Baylor Charles A. Sammons Cancer Center at Dallas and Baylor Cancer Hospital
Dallas, TX

7: Monitor Implementation of Design & Construction
8: Measure Post-Occupancy Performance Results

Goal:
To provide a system-wide artwork selection and placement program within Baylor Health Care System cancer dedicated facilities based on results and research from the Baylor Charles A. Sammons Cancer Center at Dallas and Baylor Cancer Hospital.

Challenge:
The team wanted to create a positive experience for patients and families. It was challenge to manage the expectations and communications of three stakeholder groups during approval and management of the artwork, interior design changes, construction management, building commissioning, and ongoing operations budget reviews while receiving feedback about the building during commissioning.

Solution:
Our firm created the BCC Tour app, first free mobile hospital art and LEED tour application for Apple and Android devices. The application allows patients and their families to preview the facility, ongoing activities, and the art collection with related educational information before their visit. They can also checkout a complimentary iTouch or iPad at the Concierge Desk to use the app while at the Cancer Center.

The app tour includes a facility map of every floor with more than 35 points of interest throughout the building including Lovie's Healing Garden, a monumental glass installation by artist Jim Bowman, original oil paintings by "Painter of Hope" Shannon Kincaid, Dr. Marvin J. Stone's Microscope Collection, the Horner Family Chapel and much more. The project team collects ongoing feedback about the facility, the artwork and the patient experience There are plans to continue improving the application to make it an even better tool to gather information.

Healthcare Art Consulting also provides ongoing Care and Maintenance with Infection Prevention and Control (C&M+IPC) for artwork and all other items in the facility that are not usually touched by the cleaning provider. This was a concern for all stakeholders because they wanted to protect their patients, staff and visitors as well as create a positive perception for visitors of the facility for years to come - not just the first six months or year of occupancy.

Gresham, Smith & Partners
Children's Hospital
Southeastern United States

GRESHAM SMITH AND PARTNERS

Step 5: Develop a Hypothesis
Step 6: Collect Baseline Performance Measures
Step 8: Measure Post Occupancy Results

Goal:
In order to better serve the needs of the community, a children's hospital recently renovated and expanded 10,000 square feet of the facility's neonatal intensives care unit (NICU). The expansion added 23 private single-family rooms (SFRs) to bring the level III tertiary care NICU to 64 beds total. The family-focused program at this case study site was designed to improve safety and quality to meet the specific needs of patients, their families, and staff.

Challenge:
A growing body of research evidence demonstrates that environmental conditions affect the well-being of patients, family members, and staff. For many years the NICU setting has consisted of open-bay, multi-bed environments, but in recent years there has been an increase in the design and construction of single-family rooms (SFRs) to provide more family-centered care. An individual room allows each infant to receive levels of stimuli appropriate for its developmental needs and affords privacy to family members. Yet there are also disadvantages to implementing the SFR model, such as increased costs and potentially increased isolation of staff members. Hospital decision-makers often wrestle with whether or not to implement the SFR model when designing or redesigning a NICU, and there are not enough studies documenting the advantages or disadvantages of the SFR design approach.

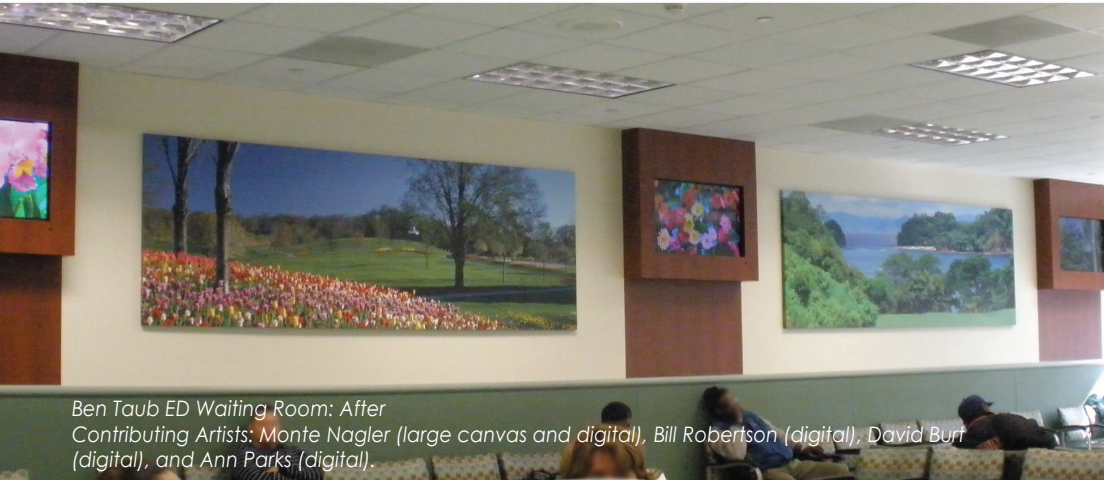
Solution:
The project team started by developing a hypothesis that staff members working in the combination NICU (open bays and single family rooms) will perceive their work environment as being more positive than the pre-renovated, open bay only NICU. We also hypothesized that staff members would perceive the combination unit to be superior in terms of quality and safety for infants and their family members when compared to the open-bay only unit.

A pre-move and post-move survey was developed and administered to the nursing staff by the NICU director. The post-move survey had a lower response rate than the pre-move survey (25% versus 55%). The findings demonstrate that the staff members now perceive their work environment to be more positive (e.g., job stress, morale at work, staff privacy) than in the open-bay, pre-renovated unit. Also, staff members perceived that the new, combination NICU is better in terms of safety and quality for infants and their families (e.g., privacy, noise levels and lighting). The next step is to submit a manuscript to a peer-reviewed journal for publication.

American Art Resources

Ben Taub General Hospital
Houston, TX

Ben Taub ED Waiting Room: Before



Ben Taub ED Waiting Room: After
Contributing Artists: Monte Nagler (large canvas and digital), Bill Robertson (digital), David Burt (digital), and Ann Parks (digital).

Step 3: Critically Interpret Relevant Evidence
Step 8: Measure Post Occupancy Results

Goal:
To improve the patient and visitor experience in the Emergency Department (ED) waiting room of a large community hospital with long wait times by introducing evidence-based art. To analyze the effect of art through rigorous research.

Challenge:
Selection of Artwork: Decisions on content, size, and placement were critical to ensure that a) the artwork could have the maximum healing impact and b) the installation was not disruptive to the hospital's daily functioning.

Appropriate Research Metric: Researchers developed a systematic behavioral observation tool to measure changes in patients' behavior before and after art was installed in the waiting room.

Flexibility: During five months of data collection, various procedural and environmental changes occurred in the ED. Observers had to be adaptable and use careful documentation to ensure consistent reporting.

Funding: Patient feedback indicated that the environment was a key determinant of patient dissatisfaction with waiting time, however funding for art was not a priority. To secure funding, the team submitted a grant proposal to The Center for Health Design's Research Coalition, which funded the production of the artwork and a portion of the research. Artists donated content for the project in the interest of research. American Art Resources and Ben Taub funded additional costs.

Solution:
Early in the project, a strong team was established including consultants from AAR, nursing staff, facility designers, administrators, and researchers. This team oversaw the art selection, installation, and the research project. The intervention was based on previous literature in the field of evidence-based art and consisted of nature images in two modalities: A rotating video display and framed-art printed on canvas.

Subject behavior was measured by systematic behavioral observation over a period of one hour. Thirty observation hours were conducted before the intervention, and 30 hours after the intervention. Noise levels were recorded during each observation. Observational data revealed a significant reduction in restless behavior and an increase in socialization, There was also a significant decrease in front-desk queries and in noise levels.

The research study revealed that evidence-based artwork could positively impact patient experience by reducing restlessness, which could be an indicator of patient anxiety and stress. The results from this study, and findings from another site, will be published in the Journal of Emergency Medicine.

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Source: *Brandis, "Approach to Falls Prevention," 215. **Hendrich et al., "Hospital Falls," 133.

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