Healthcare Design

at Shepley Bulfinch
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Shepley Bulfinch brings innovation and expertise in programming, planning, architecture, and interior design to the world’s leading healthcare institutions. Our work reflects our unique insights into healing environments, complemented by expertise in patient- and family-centered design, and the application of state-of-the-art, high-performance, and cost-effective technologies.
Responsive healthcare design must not only address the challenges of evolving technologies, but also the human element of healthcare, blending technical design innovations with thoughtful enhancements of the healing environment. Through rigorous planning and design, we anticipate and accommodate changes in technology and function while maintaining a primary focus on the healing process through patient-centered, evidence-based healthcare design. We understand the needs of patients and families, physicians and staff, as well as operational efficiency and capital cost concerns. By partnering with our clients, we deliver forward-looking master plans which transform and redefine healthcare campuses and create healing and sustainable environments.
The Cardiovascular Center (CVC) provides integrated cardiovascular clinical care while supporting the University’s medical education and research missions. The Center was designed to create an inclusive learning and healing environment for patients, visitors, and medical staff, and to make connections through medicine, art, and the natural world. One of its most striking features is a five-story glass-enclosed atrium, with a winter garden and “heart healthy” café, which becomes a meeting place for faculty, staff, and patients. Access to outdoor gardens, an auditorium, and a patient library emphasize the Center’s focus on teaching and learning. The Center offers some of the most advanced technologies and medical design features in the country. Skybridges and tunnels connect the CVC to University Hospital and C.S. Mott Children’s Hospital. To make the building more approachable, only its upper three stories are visible from the street.
Our Vision for Sustainable Design

Commitment to sustainability speaks to the first principle of healthcare: “first do no harm”. Sustainable design is a core value, from our own LEED Silver-certified offices to the strategies and technologies we use to ensure that our buildings enhance and improve the communities they serve well into the future. Our commitment is reflected in our professional staff, over one-third of whom are LEED Accredited Professionals. An essential objective of the British Building Research Establishment’s Environmental Assessment Method (BREEAM) states the premise concisely: “Make the most of the site… by studying its history and purpose, local micro-climates and the prevailing winds and weather patterns, solar orientation, provision of public transport, and the form of surrounding buildings.” This is the essential starting point for truly sustainable buildings that will endure by conservation and adaptation for future generations.

Who is the USGBC and what is LEED?
The US Green Building Council (USGBC) provides guidance and parameters for optimizing energy usage through environmental design. Leadership in Energy and Environmental Design (LEED) is the nationally accepted benchmark for the design, construction, and operation of high-performance green buildings.

Key Benefits of Sustainable Design:
- Support of Local Economies
- Lower Operational Costs
- Increased Return on Investment
- Increased Employee Productivity and Health
- Minimized Site Disturbance
- Local Tax Credits
- Utility Rebates
- LEED Certification
- Energy Recovery and Conservation
- Exceeding Code Standards
- Environmental Preservation
- Improved Air Quality and Occupant Comfort
- Reduced Operational Waste
- Increased Recycling
- Water Management for Buildings and Site
- Minimized Construction Waste
- Reduced Light Pollution
- Native Landscaping
- Healing and Psychological Benefits of Nature
- Health and Cost Benefits of Natural Light
- Financial Incentives
- A Socially Responsible Image
Sherman Health Systems’ replacement campus helps fulfill the hospital’s vision of becoming one of the nation’s best community hospitals, a leading regional institution and a model for sustainable design. Sherman Hospital is responding to developments in patient care and a substantial population growth with a 650,000 s.f. hospital and 100,000 s.f. medical office building which will deliver the best in advanced care with the compassion of a community hospital. Fulfilling the hospital’s mission to expand its definition of community care through a commitment to sustainable design, the 154-acre campus will include a 15-acre, man-made lake, the focal point of a geothermal mechanical system that will heat and cool the building, saving over 30 percent in energy costs. As the keystone to the largest geothermal hospital in the world to date, the lake will become a unique amenity for its patients, staff, and visitors.

Sherman Health Systems
Sherman Hospital | Elgin, IL

Project Specifications:
Project Type: New construction
Program: Replacement Hospital
Square Footage: 750,000
Construction Cost: $230m
Completion Date: 2009

Key Design Features:
15-acre geothermal lake
Energy savings via natural feature
Designed for campus growth
Patient-focused environment
Evidence-based design uses data analysis to verify what our century of healthcare experience has long told us: good design has a powerful impact on hospital patients and staff. With this data we can quantify that impact, enabling us to make design decisions that will improve operational efficiency, speed healing, and reduce injury. The award-winning Bronson Methodist Hospital was one of the first Pebble Projects for the Center for Health Design, a non-profit healthcare research and advocacy group. Working in partnership with the Center and with Bronson Health Systems, we have been able to measure and analyze the impact of design elements on patient outcomes and staff. The results are palpable: patient satisfaction has nearly doubled, and the hospital has witnessed a dramatic decline in the level of hospital-borne infections and nursing staff turnover.
The emergence of evidence-based design and the utilization of design research, together with the incorporation of green building principles, are the most significant developments in healthcare design in the last century. From my perspective, evidence-based design has altered the aesthetic, functional, and cultural face of healthcare architecture. Associated mandates have promoted alliances between professional practice and university programs with a profound benefit to patients, family, staff, and the wider community.

Mardelle Shepley is Director of the Center for Health Systems and Design at Texas A&M University.

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Bronson Healthcare
Bronson Methodist Hospital | Kalamazoo, MI

Designated one the first Pebble Projects by the Center for Health Design, this award-winning replacement hospital is regularly cited as a model of evidence-based design: its benchmarks offer compelling documentary evidence of its success in dramatically improving patient care and satisfaction, as well as clinical excellence and operational efficiency. The hospital’s horizontal continuity facilitates patient access: each level is devoted to a particular specialty, allowing easy transition from parking to medical office, ambulatory services, and inpatient care. The campus is zoned by activity, with critical care services to the north, ambulatory to the south, and mixed programs in the middle. To enhance patient convenience and satisfaction while increasing staff efficiency and decreasing costs, the new Bronson incorporates innovative operational initiatives, including the aggregation of eight ambulatory diagnostic sub-specialties into a single unit.

**Project Specifications:**
- **Project Type:** Replacement Facility
- **Program:** Community Hospital
- **Square Footage:** 750,000
- **Construction Cost:** $135m
- **Completion Date:** 2000

**Key Design Features:**
- Pebble Project
- Activity-zoned facility
- Atrium as “heart” of complex
- Patient- and family-focused
Solutions in Healthcare Design
Perspectives from our Design Leaders

Programming for Healthcare
In healthcare programming, establishing a department’s philosophy and goals and capturing its operational implications are crucial to a project’s success. It is essential to examine all processes closely and find the optimal way to manage the area and anticipate change: a miscalculation in a size requirement has the potential to cripple a project. As clients consider their processes they often become more aware of the complexity of operations and the range of systems and support services. Understanding the complexity and interwoven nature of programming issues often means broader representation within the owner’s design team, ultimately providing an adaptable and flexible healthcare program.

Patient- and Family-Centered Care
Family-centered care describes the way a healthcare organization’s staff works with families to provide the best care for a hospitalized patient. We design spaces that bring families and professionals together to become partners in care. Family-centered care is a constant pursuit of being responsive to the priorities and choices of families, and is applicable to all ages. The medical provider acknowledges key family members and recognizes that families have cultural and personal values to bring to shared decision-making which strengthen the treatment and healing process. Family-centered care improves clinical outcomes for critically ill patients and accommodates specific needs into a sympathetic patient care setting.

Short-and Long-Term Planning and Design
A healthcare campus is a living, breathing organism, destined to grow and change. The building designed today becomes a piece of a larger puzzle. It is important to chart future growth to maintain organizational clarity. Although future programmatic needs cannot be predicted precisely, a master plan can channel growth, ensuring land is used wisely and capital investments aren’t wasted. Such a vision will inform project density, open space and parking requirements, vehicular and internal circulation, and construction materials. It is incumbent upon the designer to anticipate changes such as the periodic replacement or augmentation of equipment and mechanical and electrical systems during the expected life of a new facility.

Designing for Children
Pediatric healthcare facilities are distinctive for their age-adaptive design, child-scale environment and spaces for family as caregivers. These facilities must allow various age groups to find comfort in their hospital environment. For pediatric patients below the age of adolescence, privacy is less important than the security of knowing that they are not alone; adolescents have a greater need for privacy, especially during illness. The presence of family can also contribute significantly to the recovery of children; a building that encourages the involvement of family as caregivers by providing them with places to sleep, learn, work, and participate in care giving will ultimately improve and accelerate the healing process.
Evidence-Based Design

Design and space configuration have been shown to significantly affect healing. Evidence-based design quantifies the impact of elements such as natural light, space proximity, and materials use, enabling us to make design decisions that improve operational efficiency and speed the healing process. Evidence-based design can have the most impact at the beginning of a project, during initial programming and planning. Defining the program requires an early understanding of these goals and affects the initial definition of project scope. It is vital to extrapolate observations to form new, innovative ideas. Only in combining known evidence with new explorations can we increase the quality of our built environment.

Project Management and Delivery

Successful project management and delivery depends upon open communication and consensus-building among the client, design team, construction manager and consultants. Clear and consistent communication promotes team building. Design and planning workshops early in the process foster communication and understanding and bring diverse thinking to the project. The workshops also introduce topics such as future growth and change, systems development, sustainable building practices, cost control, facility operations, and maintenance early in the process. To ensure that the building functions as anticipated and that the client is satisfied, visualization of spaces and operational functions are replicated during design.

Image and Identity

Architectural form is a representative language which helps define the institutional change necessary for survival in our time while retaining a sense of evolving identity. From our work with clients we have developed great sensitivity to the preservation of this character, which is constantly challenged by technology. Our projects with 19th and 20th century institutions are built on narratives of those aspirations and fragments of historical eras. The challenge is to bring these earlier narratives into concert with 21st century ambitions. We thrive when partnered with institutions that are deeply committed to reinforcing the architectural expression of their identity and values, while extending outreach to the communities they serve.

Integrated Design

The outset of a project, while aspirations are soaring, is also the time for stakeholders to consider the many innovative options for building systems. Integrated design creates opportunities for compelling architecture with energy-efficient and cost-effective infrastructure. It’s also a methodology for building consensus with all parties responsible for a project. In order for a building to function well, it must be considered an integrated, holistic system; we believe our design process should be viewed in much the same way. We build project teams that leverage the inspiration and expertise of diverse designers, consultants, and owners, resulting in designs informed by all relevant disciplines.
McLean Hospital
North Belknap and Administration Buildings
Belmont, MA, 1894

McLean Hospital was the firm’s first healthcare client. North Belknap, a three-story clinical care building, is designed in the Tudor style, and was originally known as the Belknap House for Men. The Administration Building, also built in 1894, was built in the Colonial Revival style. Much of the original, dark-stained woodwork remains in the building, which now houses administrative, clinical, and staff offices, conference rooms and a boardroom.

Harvard Medical School Campus
Boston, MA, 1906

Harvard Medical School’s 26-acre Beaux Arts complex comprises five buildings, one for administration and four for labs. To accommodate different uses while maintaining a uniform appearance, dark panels correspond to glass so that all facades appear the same.

Rockefeller Institute
Founders’ Hall
New York, NY, 1906

Following the European work of Koch and Pasteur, the Rockefeller Institute for Medical Research was established in 1901, as the first biomedical research center in the US. Founder’s Hall, the first laboratory of the Rockefeller Institute (now Rockefeller University) was completed in 1906. The building, now home to the Dean’s office, tech transfer offices, and laboratories, was designated a National Historic Landmark in 1974.

Peking Union Medical College
Peking, China, 1921

The 14-building Peking Union Medical College was built on the site of a former palace near the Forbidden City for the China Medical Boards as part of a project funded by the Rockefeller Foundation to modernize China’s medical system. The facilities of this contemporary American medical school are clad in an exterior designed to harmonize with their environs.

The structure, which united scattered surgical wards under one roof and gave the hospital a new front door, was a crowning addition to medical facilities which date back to the early 19th century. Its white brick façade complements the granite of the original Bulfinch building. To this day it is the hospital’s iconic main entrance.

Shepley Bulfinch
Innovations in Healthcare Design 1874–2000

Landmark Healthcare Projects
Rhode Island Hospital’s Main Building represented the first phase of the 25-year master plan, which was designed to transform the aging hospital campus with its scattered facilities to a modern medical institution. Innovations in the building’s design included maximizing the use of natural light to improve patient care.

Seventy-four years after the firm’s first project for Children’s Hospital Boston, the hospital’s new Inpatient Building opened, creating one of the first family-centered pediatric hospitals in the United States. Subsequent projects for the hospital have included the award-winning Main South Building (2005). Children’s consistently ranks among the top pediatric hospitals in the country.

The innovative design of this new medical campus unites three independent institutions while providing for patients in ambulatory and preventative medical treatment. Designed for expansion, it became the first hospital organized around a central mail.

The cancer research building provides space for more than 500 researchers, state-of-the-art labs, and a library. It is linked to the Institute’s Dana and Jimmy Fund buildings by overhead pedestrian bridges. The 13-story building accommodates a garage and chiller plant below ground.
Yale-New Haven Hospital
Smilow Cancer Hospital | New Haven, CT

This 14-story facility reinforces the Hospital’s reputation as a top-ranking Comprehensive Cancer Center as designated by the National Cancer Institute. Consolidating services previously scattered throughout the campus, the project focuses on making connections. A two-story lobby leads directly from the Hospital’s central atrium while a five-story, glass bridge connects to the Children’s Hospital. In the future, other bridges will link to planned clinical lab/support and bed buildings. The Center offers integrated inpatient and outpatient services, including 168 private rooms, 12 operating rooms, radiation therapy, a women’s cancer center, a pediatric oncology unit, and a full complement of imaging technologies. Sustainable design elements include a terra cotta rain screen exterior wall, light-filled interiors, and a mid-level rooftop garden for patients and families. The hospital, which opened to outpatients in October 2009, anticipates LEED Silver certification.

Project Specifications
- Project Type: New Construction
- Program: Cancer Center
- Square Footage: 516,500
- Construction Cost: $280m
- Completion Date: 2010

Key Design Features
- Terra cotta rain screen
- Rooftop healing garden
- Connections to existing facilities
- Anticipated LEED Silver Certification
Project Specifications:
Project Type: Hospital expansion
Program: Children’s Hospital
Square Footage: 240,387
Construction Cost: $102m
Completion Date: 2005

Key Design Features:
- MROR imaging system
- Cardiac cath suite with MRI
- Decentralized nursing
- Family-oriented spaces

Recipient of Modern Healthcare’s 2006 Award of Excellence, the 11-story Main South Building contains the most advanced medical technology available, including the MROR, the nation’s first mobile, intraoperative imaging system of its kind. This complements a healing environment designed to support young patients and their families while enhancing communication and staff productivity. The addition laterally expands the functions of the Main Building, unifying new and existing facilities so they function with minimal separation. The addition includes two family-centered intensive care units: a cardiac ICU and medical surgical ICU. Two floors accommodate 48 acute care beds in units designed to adapt as acuity levels change. The Main South Building marks the latest phase in the hospital’s 90-year partnership with the firm. Project challenges included building on a tight urban site that required the relocation of underground utilities and a street.
Partners Healthcare

Mass General/North Shore Center for Outpatient Care | Danvers, MA

Within Partners Healthcare, Massachusetts General Hospital and North Shore Medical Center (NSMC) have developed this suburban 120,000 s.f. Ambulatory Care Center and 80,000 s.f. Medical Office Building. The Center now houses the North Shore Cancer Center, with its four radiation treatment vaults, and a new Ambulatory Surgery Center, as well as a new location for Imaging and Cardiology Services. The buildings are arranged around a central lobby, creating a sense of one integrated center. All departments are designed for expansion while allowing for future flexibility within the footprint. Taking advantage of the surrounding site, which connects to the adjacent salt marsh and river, a central lobby and cafe offer views and access to a roof terrace. Patient zones such as infusion areas, prep-recovery bays, and surgery waiting rooms are located along the perimeter of the building, allowing for sweeping views of the Waters River.

**Project Specifications:**
- **Project Type:** New construction
- **Program:** Ambulatory Care Center
- **Square Footage:** 200,000
- **Construction Cost:** $68m
- **Completion Date:** 2009

**Key Design Features:**
- Integrated outpatient care
- Flexible and adaptive space
- Views of natural landscape
- Adjacent medical offices
Children’s Hospital of Wisconsin
Children’s Health Systems Pavilion | Milwaukee, WI

Project Specifications:
Project Type: New construction
Program: Children’s Hospital
Square Footage: 425,740
Construction Cost: $135m
Completion Date: 2009

Key Design Features:
› Herma Heart Center
› Horizontally integrated plan
› Family-oriented environment
› Clear wayfinding and circulation

This colorful and light-filled West Tower for Children’s Health Systems give the hospital campus a new image and identity while adding 144 acute and critical care beds and a new clinical procedural core. A cardiology-focused high-intensity/high-acuity platform has been planned for one level, to include operating rooms, cardiac catheterization MR and CT, and a more ambulatory environment on another, with operating rooms, minor procedure and endoscopic rooms, and interventional radiology. The overall strategy includes a four-phase plan for a child- and family-focused facility with clear internal orientation and circulation, and connectivity between the old and new campuses, in a flexible design. The project’s first phase included a 270,000 s.f. Children’s Corporate Center and 1,600-car parking structure, completed in 2006, situated close to the existing hospital, for use by both campuses as the hospital transitions between old and new.
Dartmouth Medical School
Dartmouth-Hitchcock Medical Center, C. Everett Koop Medical Science Complex | Lebanon, NH

The Koop Medical Science Complex, which houses the Translational Research Facility and Center for Office-Based Research, is being designed to allow physicians and researchers to communicate across disciplines and research areas and collaborate easily. The Complex comprises four floors of labs and an expanded vivarium and imaging facilities. A three-story atrium contains an auditorium shared by educational programs, clinical symposia, and research conferences. The atrium connects to the existing Borwell Laboratory Building and the campus beyond, fostering communication among researchers and clinicians. Within the labs, spaces for social interaction will increase opportunities for chance encounters, integrating offices and small conference areas into the lab zone. Glass walls open to views of the surrounding mountains. Open stairs allow easy sight and movement between labs and research areas.
Dana-Farber Cancer Institute
Ambulatory Care Clinics | Boston, MA

Project Specifications:
Project Type: Renovation
Program: Ambulatory Cancer Care
Square Footage: 55,000
Construction Cost: $8m
Completion Date: 1998

Key Design Features:
- Specialty cancer clinic
- Warm and welcoming space
- Resource suite and boutique
- Medical consulting rooms

This three-floor renovation creates an integrated Adult Ambulatory Clinic with two floors of diagnostic clinics and a dedicated floor for infusion therapy, all of which place an emphasis on the patient. Through the careful selection of materials, colors, and layout, the environment is warm and supportive, while a series of medical consulting rooms assure patient privacy. The patient-focused emphasis of the diagnostic floors is embodied in the Women’s Cancer Clinic, which combines a reception area with a boutique for prosthetics and accessories to help address patients’ concerns with appearance and self-image, as well as a patient resource room with educational material and a conference room for group meetings and public outreach. This Clinic has become a prototype of patient-focused design in acute care facilities for later projects, including the Cardiovascular Center at the University of Michigan.
Concord Hospital
East and North Wing Additions | Concord, NH

This 145,000 s.f. expansion and 25,000 s.f. renovation doubles the capacity of this community hospital with the state’s busiest emergency department while providing decentralized nursing and discrete family areas in five new floors of patient rooms. Located on a constrained site, the facility includes major expansion of operating rooms and central sterile supply. Acute and critical care rooms have the same dimensional module to ease future adaptation with limited disruption and cost. Designed with the patient in mind, the canopied entrance includes a waiting area that overlooks a garden and the drop-off area, and a roof garden accessible from the ICU. Patients and staff have ample daylight and views, and garden courtyards create a buffer from the road. It is the first LEED-certified community hospital in New England, featuring green roofs, native plantings, and maximized permeable surfaces, reducing storm water impact and minimizing heat islands.

Project Specifications:
Project Type: Addition and Renovation
Program: Hospital Building
Square Footage: 170,000
Construction Cost: $50.5m
Completion Date: 2008

Key Design Features:
- LEED certified
- Room for future expansion
- Adaptable patient room modules
- Patient-focused environment
La Clínica is an academic medical center designed around the principle of patient dignity with practical plans for expansion. The hospital will be a major component of the rapidly growing University overlooking Santiago from the foothills of the Andes. Planned as three integrated facilities, with an inpatient wing, diagnostic and treatment building, and clinic and support services structure, the design allows for the phased and independent development of each component. The facility will be built over a 700-car garage on a steep site that offers dramatic views and multiple access points. The hospital places particular emphasis on patient respect and privacy, with separate corridors for patient and visitor movement. Quality of medical care is enhanced by providing patients with spiritual and physical amenities, which include a large chapel. The design of La Clínica follows the firm’s completion of the University’s Master Plan, Business School, and Library.
This Master Plan helps the nation’s first cancer center fulfill its commitment to setting national standards for cancer care, research and education by addressing short, mid- and longer-range needs of its research, clinical and education programs. The Master Plan has addressed and broadly defined the needs for specific programs, as well as utility infrastructure and parking requirements. Based on strategic goals, growth assumptions, and priorities, the Master Plan for this 25-acre campus included the development of benchmarked space standards for research and clinical areas, and provided a strategy for using existing facilities most effectively so as to drastically reduce the short-term need for new construction. Campus zoning, connections, collaboration, and “highest and best use” were established and in conjunction with a facility analysis, used to help determine optimum program location and future development sites.

**Project Specifications:**
- **Project Type:** Healthcare Master Plan
- **Program:** Cancer Research/Treatment
- **Square Footage:** 497,000
- **Size:** 25 acres, 15 buildings
- **Completion Date:** 2006

**Key Design Features:**
- Maximizes space utilization
- Establishes standards
- Utilizes existing facilities
- Defined visual and functional clarity

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**Total Potential Site Increase:** 1,000,000 +/- GSF
**Total Potential Parking Increase:** 2,520 spaces
Dartmouth-Hitchcock Medical Center
New Ambulatory Care and Diagnostic Treatment Building | Lebanon, NH

Project Specifications:
Project Type: Expansion/Renovation
Program: Ambulatory Care/Diagnostics
Square Footage: 750,000
Construction Cost: $178m
Completion Date: 2005

Key Design Features:
- Allows increased care volume
- Fosters patient convenience
- Connections to medical campus
- Flexible “modules”

This clinical expansion and renovation project addresses a paradigm shift from inpatient to outpatient care. It provides expansion space for diagnostic and treatment services and clinic/office space for the recruitment of medical staff while ensuring connectivity with the rest of the medical campus. The building includes high-volume departments such as General Internal Medicine, Obstetrics and Gynecology, Pediatrics, and Surgical Specialties. It is designed using a flexible “module” concept, each module containing twelve exam rooms, waiting/reception areas, clinical support and office space. The diagnostic and treatment expansion and associated renovations include ambulatory operating rooms and support, a same-day care unit with prep/recovery rooms, a new endoscopic procedure suite, a new emergency department, and expanded imaging modalities which offer an operational focus on improved processes and patient convenience.
DEFINING DESIGN
Design succeeds when it fosters inspiration. Its legacy is not shaped in stone or steel, but in the minds of those it touches. At Shepley Bulfinch we offer clients innovative design solutions in architecture, planning, and interior design. We give our clients an edge by drawing on the insights we have gained through our experience with leading academic, healthcare, research, and civic institutions. Our success is that of our clients and the design process we shape together.

THE DESIGN PROCESS
Design begins in the client’s mind. We introduce a transformative process that makes that vision real in a form they could not have imagined before. The process is as critical as the final project: creating a culture of inquiry that identifies an institution’s changes, challenges, and competition. We work collaboratively to develop design solutions that will achieve our clients’ visions.

LEADERSHIP
The solutions we develop for clients are as diverse as our creative teams. The constant is the leadership, commitment, and responsiveness that we offer, and it shows. Clients who come to Shepley Bulfinch by reputation stay with us by experience.

In support of our commitment to the environment, Shepley Bulfinch has printed this brochure on New Leaf Reincarnation Matte Paper. The paper has been designated Ancient Forest Friendly and is manufactured with wind power and electricity that is offset with Green-e® certified renewable energy certificates. The paper is made from 100% recycled fibers with 50% post-consumer waste processed chlorine-free.