



**Applying Evidence-Based Design to Achieve
Ultimate Success on Your Next Project**

RS&H



Applying Evidence-Based Design to Achieve Ultimate Success on Your Next Project

by Jennifer Youssef, AIA, ACHA, LEED AP; Jessica Whitlock, NCIDQ, CHID, IIDA; Victoria Villarreal, Assoc. AIA, EDAC; Jeannie Syler, RN, NCIDQ, EDAC

A quality care environment for patients and employees can help medical facilities stay at the top of patient satisfaction surveys and reach quality and safety goals. These goals are foundational in evidence-based design (EBD).

EBD asks a big question: **Does architecture impact healthcare outcomes?**

We believe implementing EBD strategies in healthcare architecture has the potential to positively impact patient outcomes, staff retention, and even throughput, all of which are measurable.

In the ever-evolving landscape of the architecture/engineering/construction (A/E/C) industry, EBD is the cornerstone of innovation and functionality in healthcare design. The fusion of research, expert knowledge, and real-world data empowers professionals to create spaces that not only captivate the eye but enhance the lives of those who inhabit them.

EBD is defined as the [process of basing decisions](#) about the built environment on credible research to achieve the best possible outcomes. While it may seem linear, EBD is a dynamic, fluid approach. Its diverse applications involve collaboration among stakeholders, vendors, suppliers, and various other participants.

Comparison of Evidence-Based Practices in Design and Medicine		
Category of Comparison	Evidence-Based Medicine (EBM)	Evidence-Based Design (EBD)
First Formal Recognition	1992	2003
Types of Research Literature	Quantitative methods (including systematic, reviews, meta-analyses, and randomized controlled trials) rank highest on the evidence pyramid.	Qualitative methods are common; quantitative methods are also used; few randomized controlled trials, systematic reviews, or meta-analyses.
Quantity of Literature Available	Huge and growing—more than 100,000 articles published worldwide in the top 50 biomedical journals from 1995—2002 (Soteriades, Rosmarakis, Paraschakis, & Falagas, 2006).	Relatively small, but growing body of rigorous studies relating to healthcare design (Ulrich et al, 2008).
Education	Research skills, methods, and concepts are ingrained in undergraduate and post-graduate education.	Limited but growing emphasis on research skills in design education.
Level of Rigor	Relatively high level of rigor in EBM because the education system teaches clinicians how to read, evaluate, and apply literature as well as how to conduct their own research.	Rigor is often misunderstood by designers. This may improve as the design community becomes more informed about EBD methods.

Source: <https://journals.sagepub.com/doi/abs/10.1177/193758670900200207>

Linking research and design is at the core of EBD. It is a commitment to observe the results of design and uses a mixture of both qualitative and quantitative data to determine what suits the project. Documenting EBD results in architecture contributes to the advancement of the field, helps build a stronger body of evidence, and encourages the adoption of design practices that positively impact healthcare outcomes and experiences.

Adopting EBD practices, informed by well-documented outcomes, directly translates into tangible benefits for healthcare facilities and their occupants. Collaboration between the clients, the staff, the patients, and the team generally leads to an enhanced experience for all.

The Value of Evidence-Based Design

1

KNOWLEDGE SHARING

2

DEMONSTRATE EXPERTISE

3

ENHANCE STAFF SATISFACTION AND EFFICIENCY RESULTING IN A HAPPY CLIENT

4

RESEARCH VALIDATION SUPPORT IMPROVED PATIENT OUTCOMES

5

COLLABORATE WITH THE CLIENT'S EXPERTISE

6

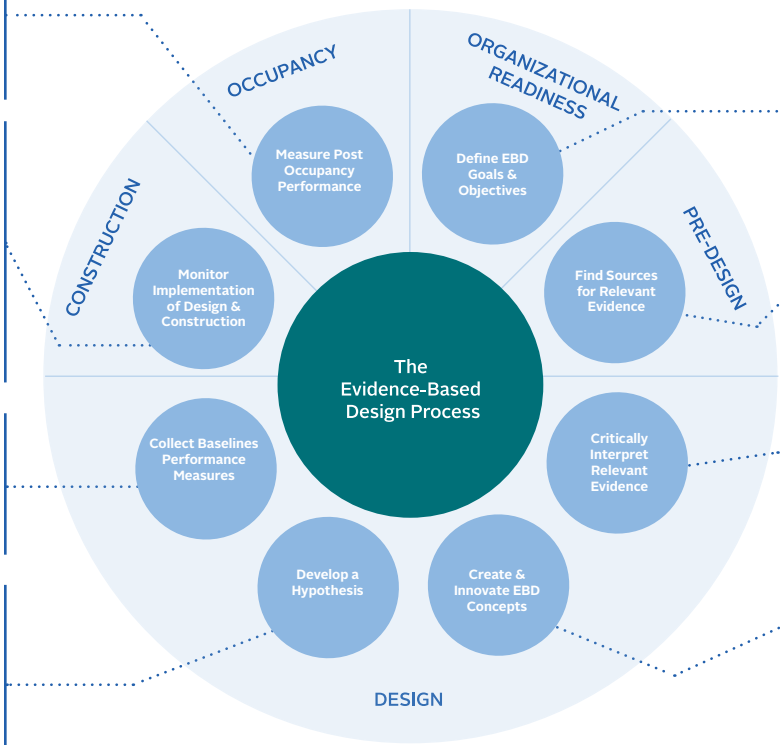
COLLABORATE WITH THE TEAM

MEASURE - The research team implements the research study as outlined in the research plan, tracks any changes, and makes necessary adjustments. Data collection is the most time-consuming and costly phase of a research project.

MONITOR - It's the responsibility of the project team to ensure that all design strategies are executed as specified in the design documents and in compliance with the proposed research plan. At the end of construction, the project team verifies that the commissioned building complies with the EBD intent and is ready for post-occupancy research.

COLLECT - Assess the current processes at a macro level and define project metrics that will be used to measure outcomes. These will aid in the creation of the functional and space program.

HYPOTHESIZE - Hypotheses are predictions of the expected relationship between variables and can be tested through empirical research. Hypotheses point out the direction for data collection and provide guidance for analyzing and interpreting the data.



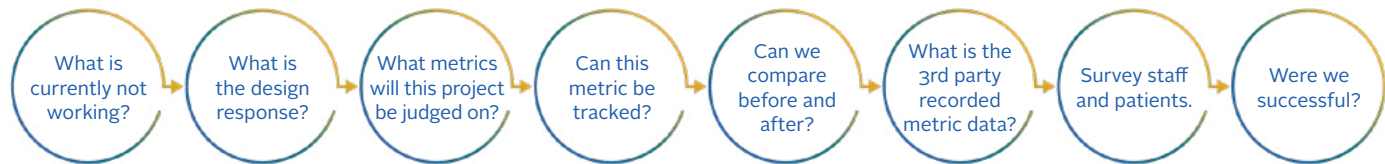
DEFINE Establish a vision that defines the intentions, direction, and goals & objectives for the project. The team can then properly articulate the project goals in terms of their desired outcomes.

FIND A literature review will identify gaps in knowledge, determine what relevant research has already been performed, and inform the basis for new research.

INTERPRET To determine if the evidence is credible and can be used to inform the design and the hypotheses, it is important to understand the relevance, rigor, validity, and generalization of the information cited.

CREATE Translate relevant evidence into design guidelines—summary statements that designers use for guiding aesthetic, functional, or compositional decisions. The team can begin to create preliminary design concepts derived from the design guidelines.

Source: <https://www.healthdesign.org/certification-outreach/edac/about-ebd>



Small Firms, Big Impact

In the continuously evolving healthcare design industry, small to mid-sized firms face challenges adapting to the ever-changing demands. Large firms remain competitive as they have the financial resources and dedicated EBD staff expertise.

Embracing EBD empowers firms of all sizes to meet market requirements effectively and equips them with vital data essential for making informed design decisions. **While the idea of integrating EBD may initially seem daunting, it is feasible and remarkably impactful.**

As designers, architects intuitively make daily design decisions that impact the environment of care. **Moving beyond intuition, EBD offers a fluid approach, supported by evidence and documentation,** that allows firms to support their clients in making design decisions for the best possible outcomes. Meaningful conversations that inspire research questions and motivation for the firm collectively contribute to creating healthcare environments that prioritize patient well-being, staff efficiency, safety, and the delivery of high-quality care.

The Center for Health Design outlines an [eight-step process](#) to harness the full power of EBD to support projects. For firms with limited resources and capacity, tackling all steps may be challenging, but don't let it deter you from applying EBD in your work. Even utilizing the first few steps of EBD can make a positive difference in your project, although all eight steps are valuable.

These steps include:

1. Setting goals
2. Sourcing relevant evidence
3. Critically interpreting the evidence
4. Crafting EBD concepts
5. Developing a hypothesis
6. Collecting baseline performance measures
7. Monitoring implementation of design and construction
8. Measuring post-occupancy performance results

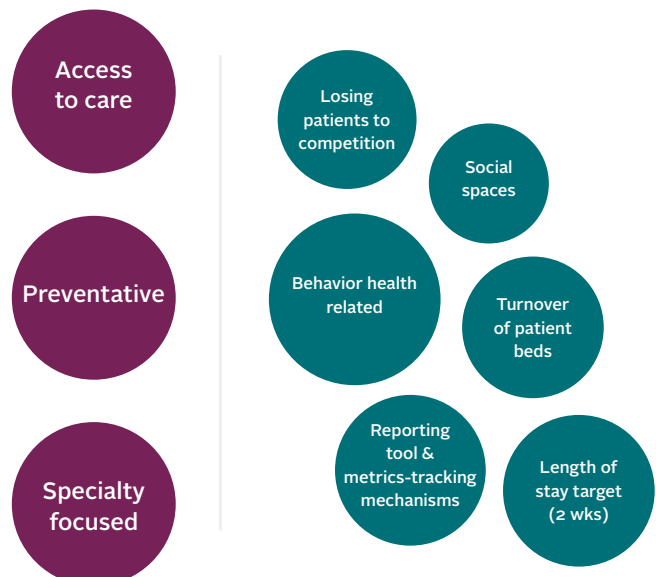
Keep in mind that the application and approach can vary based on the project, client, and overall goals. EBD involves measuring and evaluating various metrics to assess the impact of design decisions.

Here are some common metrics that can be measured with EBD in healthcare architecture:

1. Patient satisfaction
2. Patient outcomes
3. Staff satisfaction and productivity
4. Operational efficiency
5. Energy efficiency and sustainability
6. Financial performance

When approaching a new project with an EBD lens, starting small is crucial. Focus on specific design metrics that are relevant and important to your client. A few examples include infection-control, patient falls and user experience. Stay practical about aspects that can be thoroughly studied to drive a meaningful impact.

Understanding the Why





Evidence-Based Design in Action

Healthcare organizations are under intense pressure to improve the efficiency and effectiveness of care delivery and identify ways to improve performance outcomes. Since the physical environment can potentially contribute to or aggravate these challenges, it is essential for healthcare design teams to closely examine the relationship between building design and patient, staff, family, and environmental outcomes.

EBD Tools & Process

There are three types of data collection for the EBD process: quantitative, qualitative, and mixed methods.

Quantitative data is the empirically measured variables, objectively measured, and unbiased variables, such as Hospital Consumer Assessment of Healthcare Providers and Systems scores (HCAP), Press Ganey scores, documented lighting levels, fall rates, infection rates, etc.

Qualitative data emphasizes multiple participant views and theory generation. It is open-ended, flexible, and considers personal perspectives and experiences.

The mixed method is a combination of quantitative and qualitative methodologies.

Applying a particular data collection method will depend on what type of data you want to collect for your project.

Consider your project's goals, urgency, and variables. No single data collection method fits all. There are many options for collection, including but not limited to:

- In-person interview
- Anonymous paper questionnaire
- Digital survey

Careful selection of measurement tools is vital to achieving optimal results.

In early 2022, AdventHealth Altamonte Springs partnered with RS&H to renovate their Mother-Infant Units. Embracing the EBD method, the RS&H team began the process by setting a goal to use EBD to bring a scientific and research-driven approach to the hospital's architectural design. By incorporating empirical evidence and best practices, EBD would support design decisions that promoted healing, supported staff, enhanced safety, and improved the overall quality of healthcare delivery at the facility.



Examples of Evidence-Based Design Tools

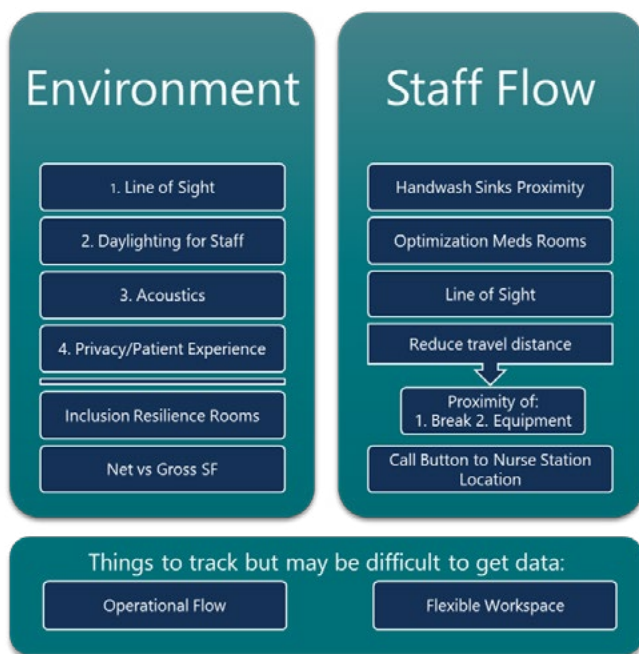
Experiment or randomized control	Survey research
Quasi-experiment	Case study
Before-after study (pre-post study)	Ethnographic study
Prospective vs retrospective	Grounded theory
Correlational study	Just-in-time theory

The team considered resources such as diverse internal talent, finances, and effective time management.

Diverse teams bring together individuals with different skills, expertise, and perspectives, fostering a collaborative and dynamic work environment.

By blending realistic expectations with innovative thinking, the RS&H team aimed for exceptional outcomes.

RS&H conducted an initial survey with hospital staff and patients to fully understand the client's needs and project requirements. This survey aimed to determine a relationship between design factors and healthcare outcomes. Following this, enhancing clinical workflow, implementing infection prevention measures, and bolstering staff/patient safety emerged as key priorities based on the survey findings.



RS&H designers immersed themselves in the project, conducting on-site visits to the AdventHealth facility. They observed existing rooms, engaged with staff, investigated new furniture options, created mockups, and conducted more surveys with patients and staff. The team employed a blend of quantitative and qualitative methods to drive the project's success but focused more on qualitative data to get started. Our designers focused on personal perspectives and experiences regarding the needs and wants of the staff and patients at the AdventHealth facility.

This meticulous data collection culminated into an EBD project that addressed the client's requirements and catered to the staff and patients' needs.

Everyone from physicians and nurses to support team members were able to review furniture options, floor plans, and design cues such as lighting locations to the angle of the television. Selected furniture was placed into mockups and presented for another round of feedback. This led to a design with better lines of sight, wider passageways, fewer falling hazards, and more room to work.

By relying on research and data, EBD empowered RS&H designers and other project partners to make decisions grounded in facts rather than assumptions or trends. This approach resulted in larger patient rooms, expanded furniture options, and optimized access to essential tools for hospital staff.

Designing for Tomorrow

For hospitals and healthcare providers striving to provide the best patient experience, safety, and quality care, their facilities must stand up to the highest standards. To ensure those highest standards are met, facility staff often know best. That's why engaging staff when designing or redesigning a space is important. Allowing them to provide direct feedback on what works and what doesn't will only elevate the design. Doing so will increase staff investment, retention, and quality of care.

EBD in healthcare projects facilitates a process that creates a visually appealing but also functional, safe, and efficient built environment that is conducive to positive patient outcomes.

It represents a collaborative approach to design, grounded in research and tailored to the unique needs of healthcare settings.

It's entirely normal to run into roadblocks while using EBD on design projects, but it's important to allow fluidity in your project. **Documenting EBD results is not merely a documentation of the process but a catalyst for progress.**

It fuels innovation, strengthens the foundation of knowledge, and paves the way for a future where healthcare environments are not just functional structures but holistic spaces that promote healing, well-being, and long-term collaboration.



About the Authors



Connect with Jennifer



Jennifer Youssef, AIA, ACHA, LEED AP

Jennifer has dedicated her more than 20-year professional career as an architect to healthcare. She brings a unique perspective to her project work, having served as an owner's representative for several years. Her responsibilities include directing project management efforts, facilitating coordination between the architecture, interior design, and engineering disciplines, establishing and maintaining project quality control, and delivering a quality project with attention to client service. Jennifer is a board-certified healthcare architect with extensive experience in staff oversight, assuring projects adhere to quality, schedule, and budgetary goals, and providing an elevated level of service to client needs.



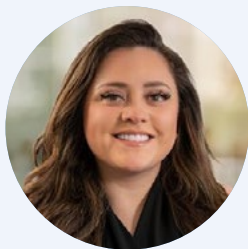
Connect with Jessica



Jessica Whitlock, NCIDQ, CHID, IIDA

Jessica is RS&H's Central Florida Healthcare Studio Leader and has 11 years of experience in healthcare interior design, architecture, and project management. She is a strong design professional with a Bachelor of Applied Arts in Interior Design. She is NCIDQ Certified and holds a Florida Registration in Interior Design. She is also AAHID certified and a member of the International Interior Design Association, Women in Healthcare, and Association of Medical Facility Professionals. Jessica's experience ranges from acute care, outpatient care, behavioral healthcare, women's specialty, and oncology care.

About the Authors



Connect with Victoria



Victoria Villarreal, Assoc. AIA, EDAC

Victoria graduated with a Master of Architecture from Texas A&M University, specializing in Heath Systems and Design. Since graduating, she has garnered experience in medical space and equipment planning with different healthcare institutions in Texas, California, and Florida, which has fueled her passion and curiosity to explore opportunities and practical design solutions within architecture. She has acquired and honed the most important design skill, listening. Victoria has consistently demonstrated the ability to absorb abstract problems, outline the problem with sets of multidisciplinary decision criteria to generate solutions and collaborate with clients during the design process.



Connect with Jeannie



Jeannie Syler, RN, NCIDQ, EDAC

Jeannie is an interior designer and nurse clinician who has brought her unique perspective and experience to create innovative and healing spaces within the healthcare industry. With over 20 years of nursing experience, she understands the importance of creating aesthetic environments that promote wellness and optimize patient outcomes. Her practical experience gives her a highly honed understanding of how well design environments can support the effort of medical professionals to achieve optimal patient outcome. Jeannie has first-hand knowledge of how commitment to advancing best practices that improve health outcomes for all occupants can be seen using evidenced-based design strategies.