EBD OVERVIEW

The Center for Health Design transforms environments for a healthier, safer world through research, education, and advocacy.

THE CENTER FOR HEALTH DESIGN®

Take Action

A well-designed healthcare facility literally shapes all healthcare delivery - directly and indirectly underpinning patient and staff safety.

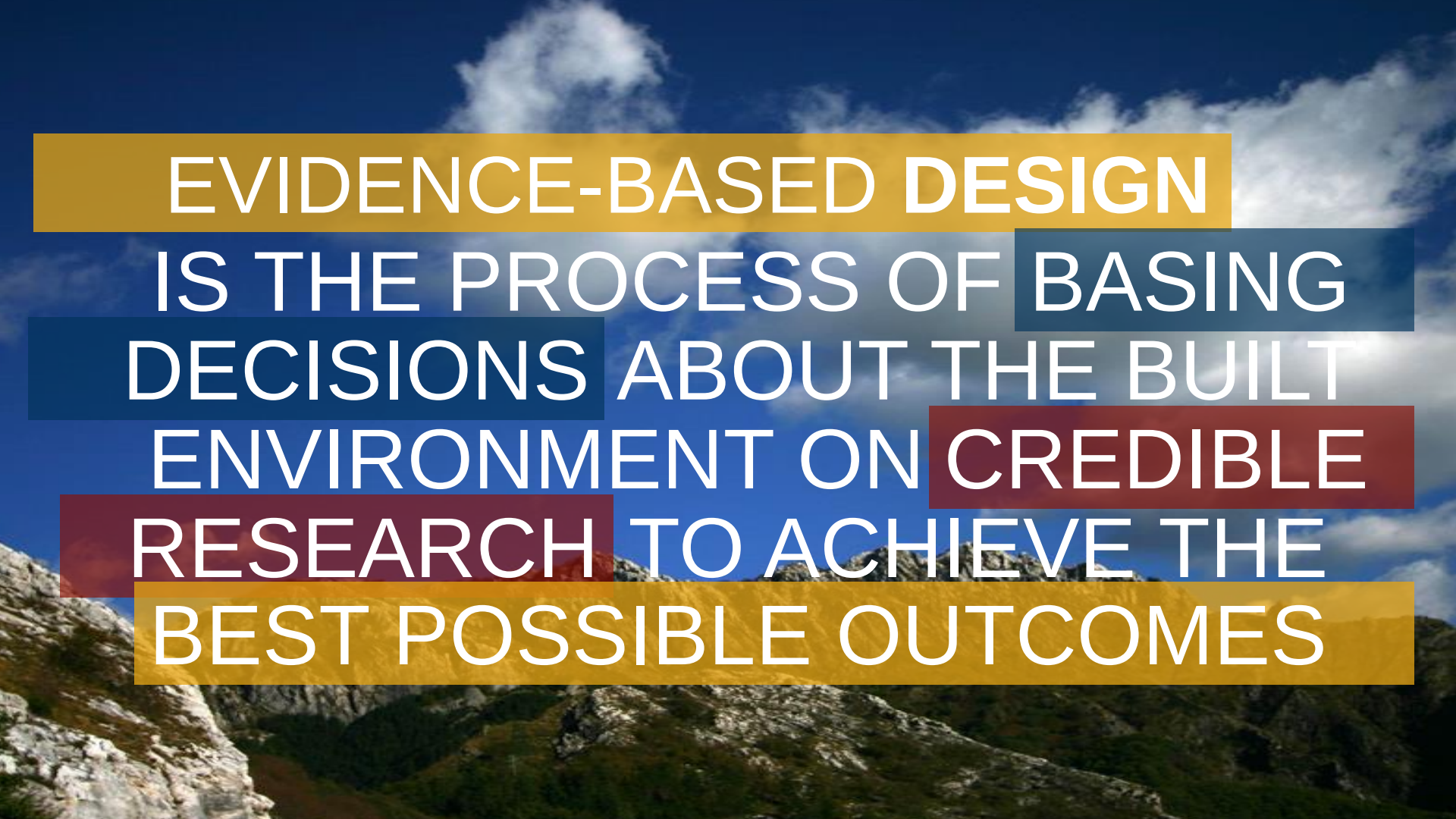
Evidence shows that poorly designed and operated healthcare environments contribute to adverse events and subsequent patient harm such as healthcare acquired infections, medical errors, and patient falls.

$35.7 to $4 billion

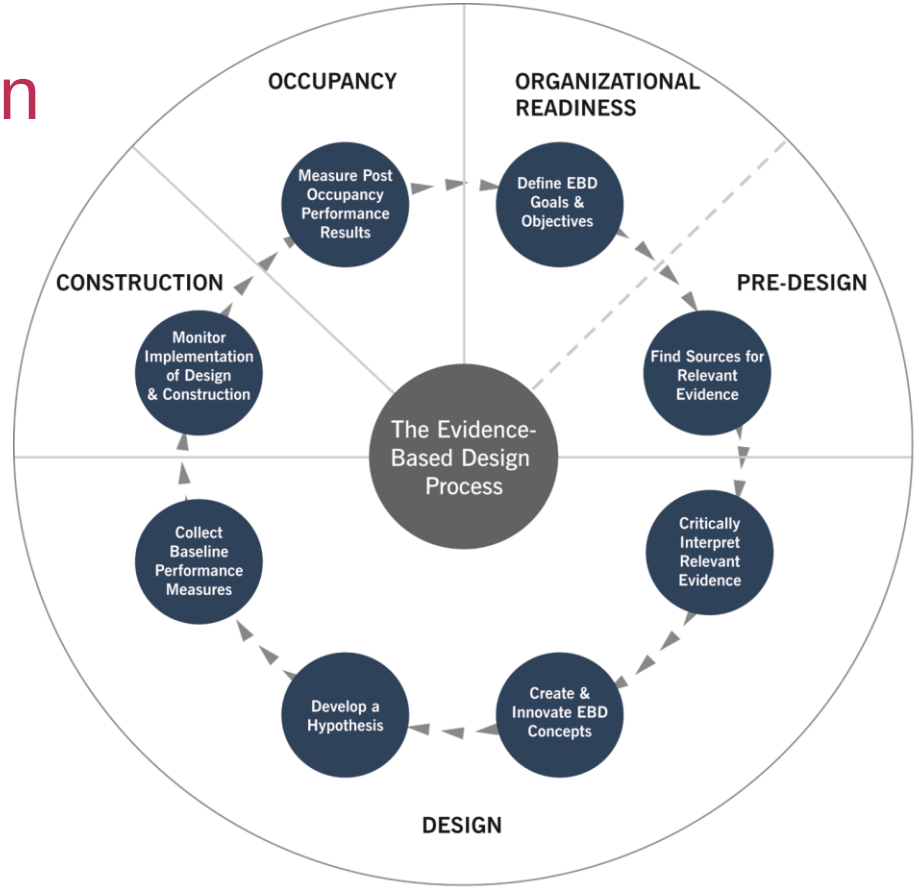
Annual direct medical costs of healthcare-acquired infections, according to the CDC (Scott, 2009).

$800 billion

Estimated cost of medical errors and preventable patient harm, the third leading cause of death, according to the 2013 Forum on Emerging Topics in Patient Safety.


EVIDENCE-BASED **DESIGN**
IS THE PROCESS OF BASING DECISIONS ABOUT THE BUILT ENVIRONMENT ON CREDIBLE RESEARCH TO ACHIEVE THE BEST POSSIBLE OUTCOMES

Evidence-Based Design Process (Eight Steps)



Key Differences Between EBD and Typical Project Delivery

Addresses Healthcare Trends/Challenges

- Develop **design strategies** targeted to improve clinical, environmental and safety outcomes.

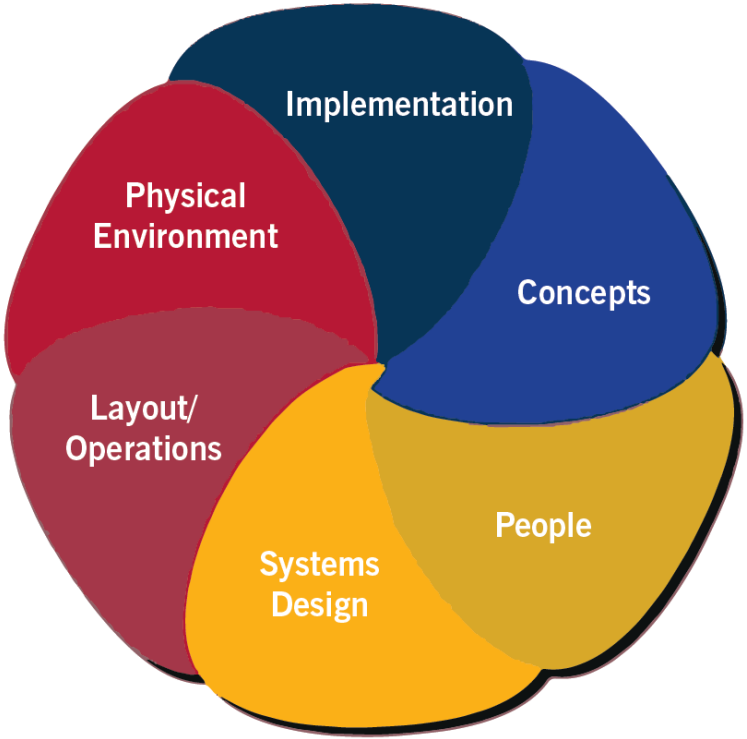
Research is Used

- EBD process uses **relevant research** to educate the project team and guides the development of design strategies. These strategies are linked to achieving outcomes.

New Research is Created

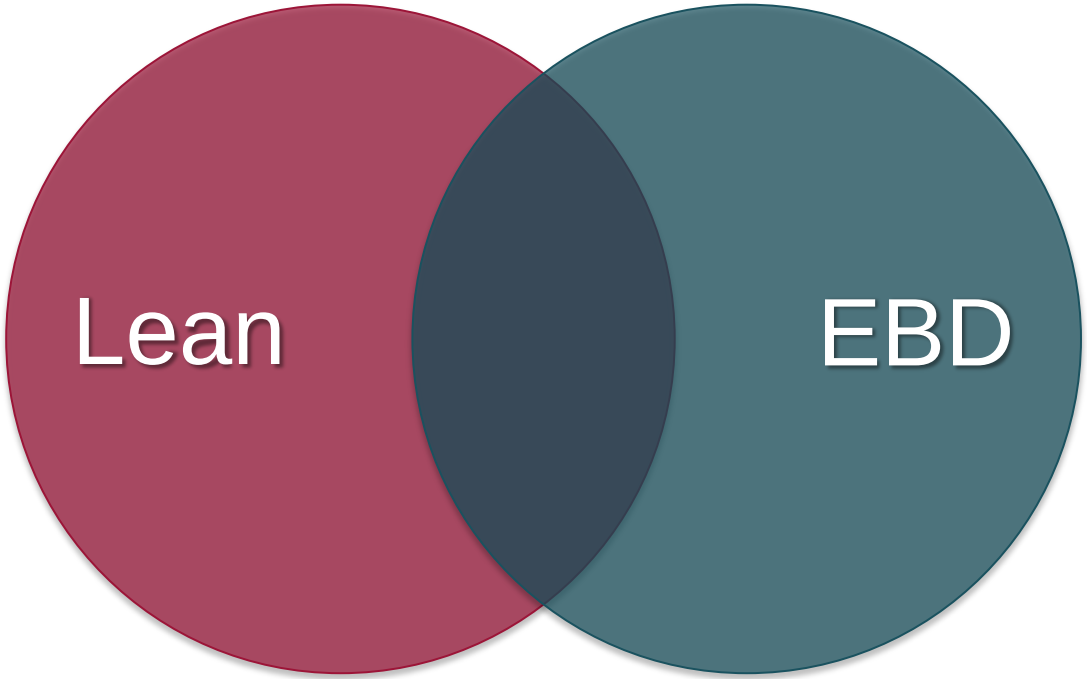
- Conduct **post occupancy evaluation/research** to create new evidence and report the results.

Other Considerations: The Environment of Care



The impact of the physical environment on organizational culture can best be understood by considering the components of the Environment of Care (EOC).

Lean and EBD



An EBD Model

Disciplined Teamwork, Execution & Institutionalization

Value Proposition for CEOs

The New Reality:

Healthcare faces greater transparency around patient and workforce safety/quality issues

Progressive organizations achieve measurable improvements and operating savings through evidence-based design.

The Business Case for EBD in Healthcare

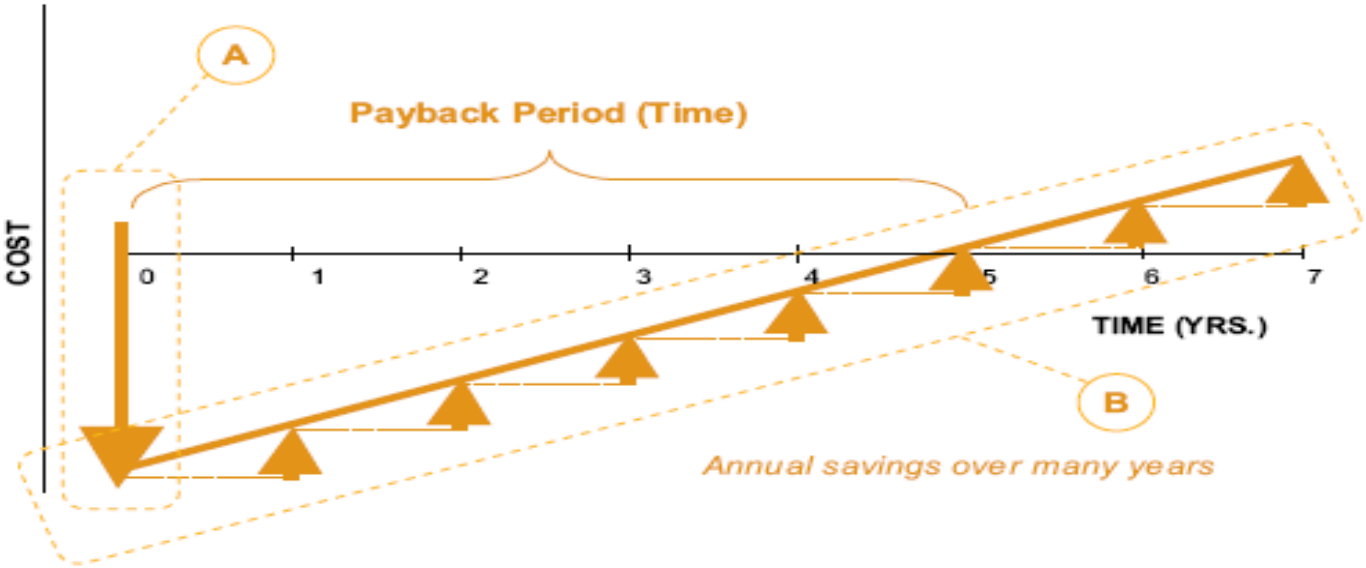
Demonstrate facilities investments contribute to improvements in:

- Patient-care quality
- Safety and satisfaction of patients and staff
- Enhancing the bottom line

Create a **business case** and look at the entire life cycle of the project and consider:

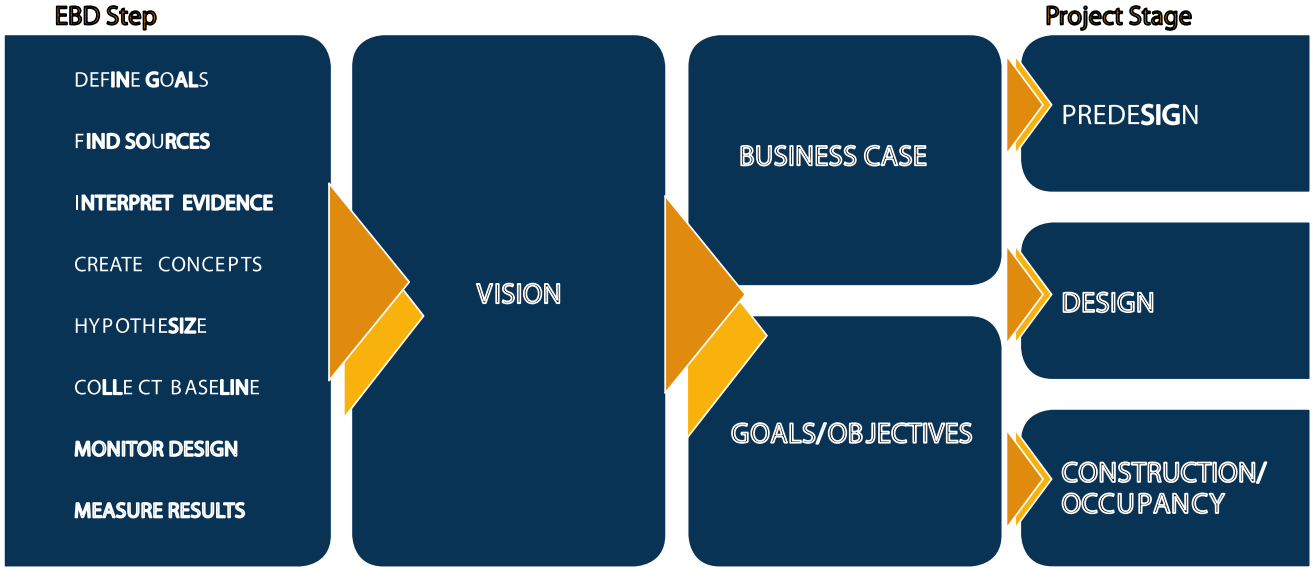
- First year and multi-year costs
- Revenue and operational savings
- ROI based on a multi-year payback period
- Assessment of baseline performance changes

The Business Case – Return on Investment



Source: Zofia Rybkowski, PhD Candidate, UC Berkeley, Engineering and Project Management, Dept. of Civil and Environmental Engineering.

EBD Process Integrated into Typical Design Process



Who Should be Involved in an EBD Project?

- An interdisciplinary project team, with key stakeholders from multiple disciplines, provides valuable insight to the vision, goals and objectives
- Understand how to setup an interdisciplinary project team and the importance of key stakeholders roles

Research Context

Linking research and design is at the core of EBD

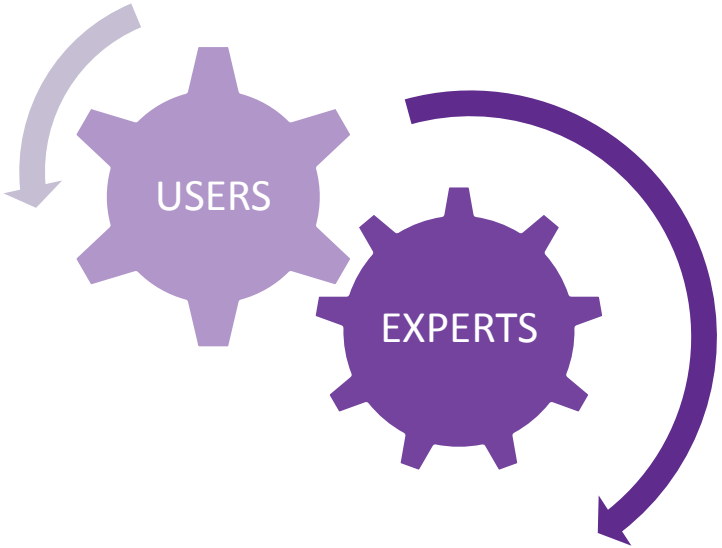
- Research is used to support design decision making and to evaluate design innovations
- Research aims to generalize the results and often leads to further studies and discoveries

The goal is to use facility design to help improve healthcare outcomes

Define the Research Question

- Developing a research question amid all of the design and healthcare challenges (or trends) is an important step prior to searching for relevant evidence.
- A good research focus will make finding information easier and help the team understand, organize, and apply the information to the design challenge.

Generate Meaningful Research Questions



Respect and Harvest Experiential Knowledge

Ask Good Questions - Early

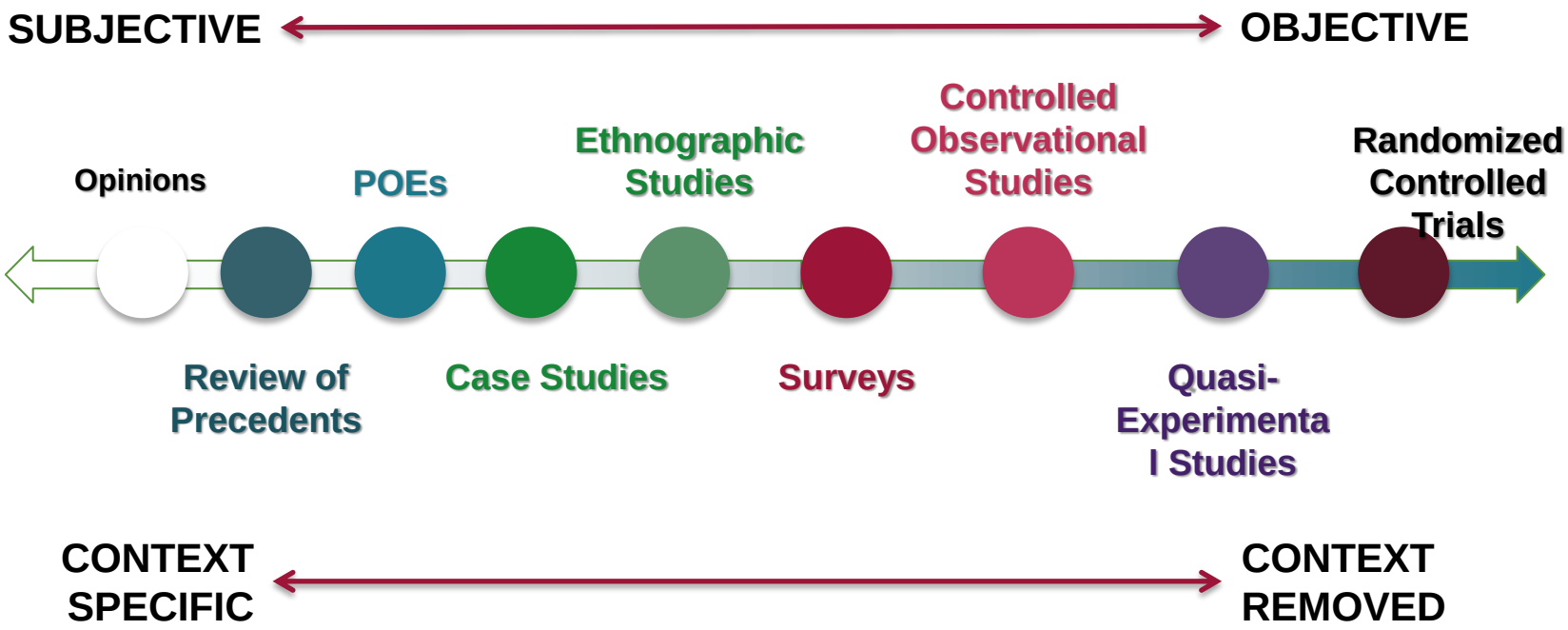
- Identify areas of interest about which there is a question or an unknown

- Define the research topic(s)
  How can design reduce risk of falls?
  How can design reduce patient stress?
  How can design improve patient satisfaction?
  How can design improve work process & flow?
  How can design increase efficiency?

IDENTIFY ORGANIZATIONAL CHALLENGES & UNIQUE OPPORTUNITIES


There is
A LOT of
information
out there.
How do you know where to look and how to start?

Evidence comes in a variety of forms



Know Where to Look

"Key Words are the key"

Online Journals

- Journal Website
- Abstracting/ Indexing Resource

- HERD Journal
- ENVIRONMENT & BEHAVIOR
- JOURNAL OF ENVIRONMENTAL PSYCHOLOGY
- JAMA
- Other medical journals

Databases

- Knowledge Repository
- Central repository
  - Public
  - In-house
    - RIPPLE

Abstract/Indexing Service

- Repository of Abstracts
  - For–profit agencies (fee based): EBSCO
  - Government agencies (free): PubMED
  - Nonprofit entities (CHD/Informedesign)
  - Search Engines (Google scholar, looksmart)

Search Engines

- Full-text search engines
  - Google
  - Ask.com
  - Bing
- Many organizations and societies have search engines within their own websites

Knowledge Repository

www.healthdesign.org/search/articles

3,500+

References

500+

Key Point Summaries

FGI FACILITY GUIDELINES INSTITUTE

RESEARCH · DESIGN connections

NIHD Nursing Institute for Healthcare Design
INSPIRING AND EDUCATING NURSES

ASHE American Society for Healthcare Engineering of the American Hospital Association

AIA

ACADEMY of ARCHITECTURE for HEALTH FOUNDATION

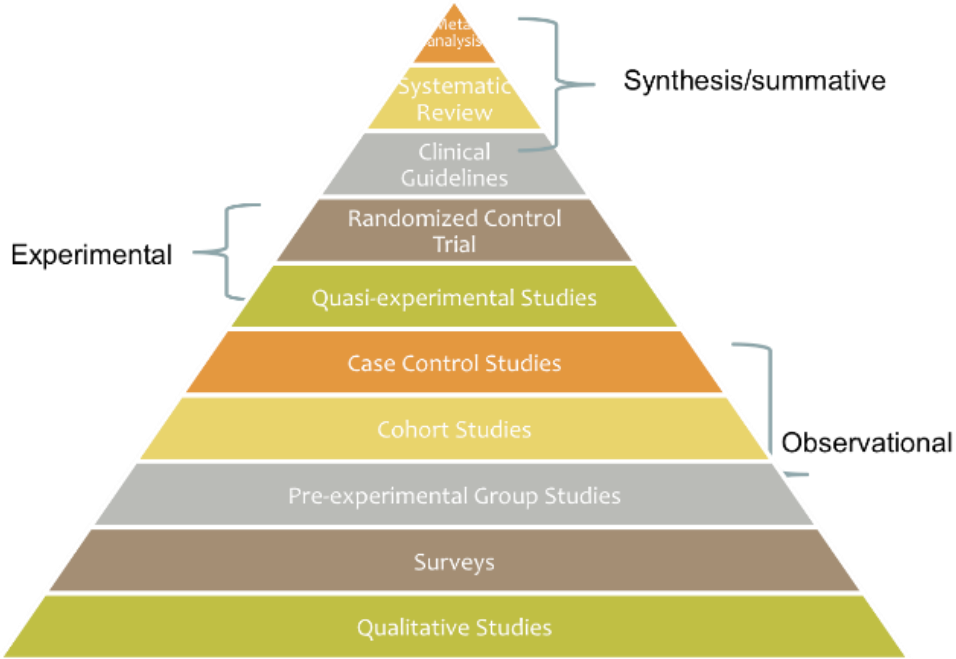
Critically Interpret the Evidence

How do you know if you should apply these design strategies to your project?

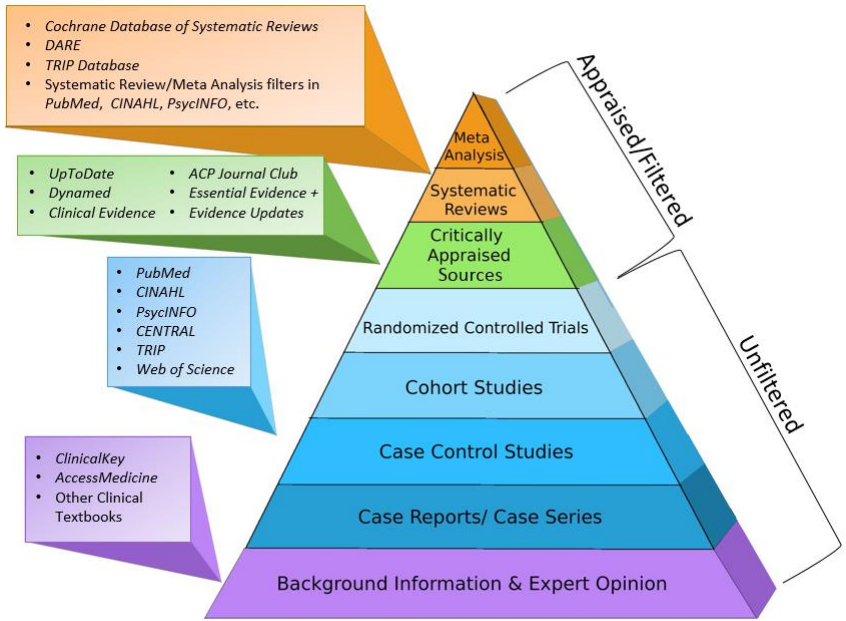
You must first evaluate the strategies against your project goals, objectives, vision, and research questions.

Some studies, recommendations, and best practices will be better than others – more credible, reliable, and valid.

Evidence hierarchy

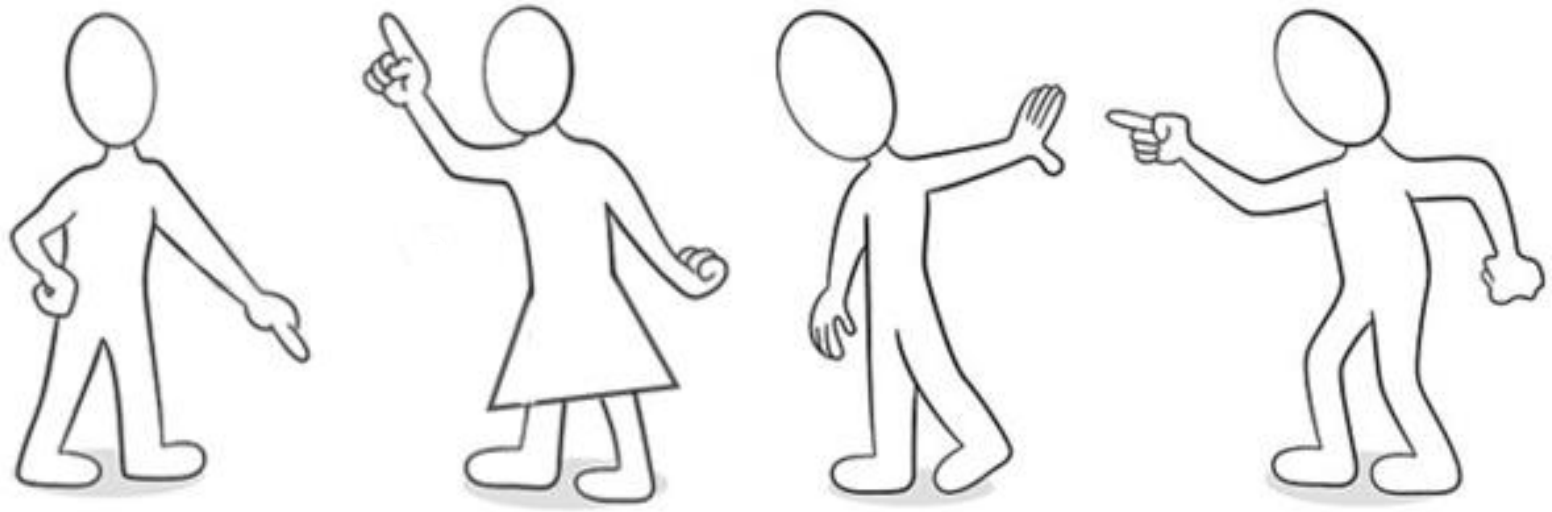


Evidence-based Practice Resources: Randall Information Center | USC School of Social Work



Evidence Based Medicine: Ebling Library, Health Sciences Learning Center UW-Madison

Opinions v. Opinionated, Evidence v. Conclusions



Use the Evidence

"Don't wait for perfection.
Refining occurs in the process of doing."

-Angelica Galland

Monitor Construction

- The objective is to **ensure that all the design strategies directly linked to EBD are maintained** during the bid and negotiation process. The project team's role is to monitor design intent by:
  - Acting as **EBD "Vision Keepers"**
    - construction documentation
    - bid request, review and approval
    - construction site field observation
  - **Activation Planning**
    - Communication systems
    - Move management
    - Staff training
  - **Completing Commissioning**
    - System Performance

Research After Occupancy

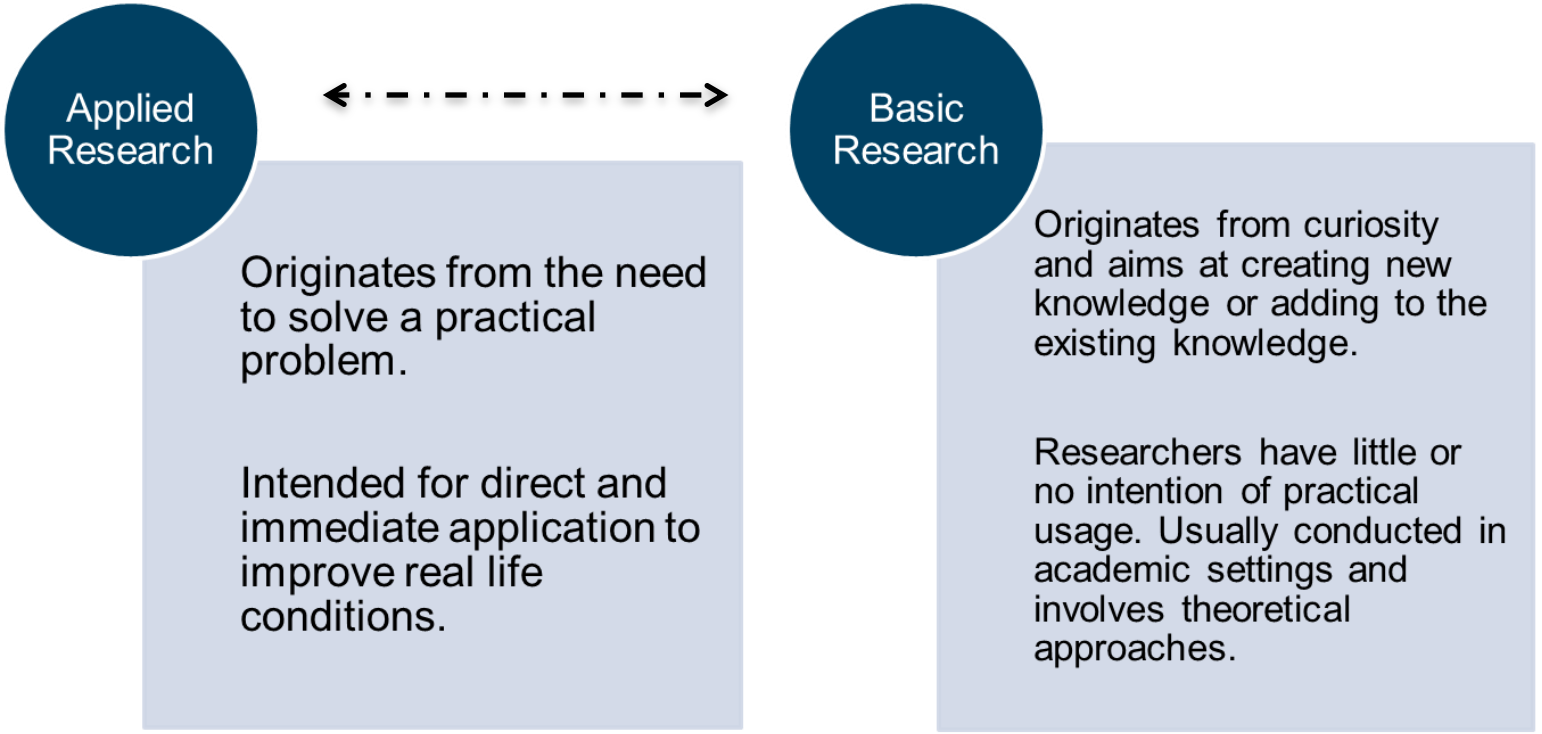
Evaluating the impact of design on different outcomes – patients, families, staff and the organization – is a key part of the EBD process. Research completed after construction and initial occupancy informs the project by:

- Testing the theories and hypotheses
- Examining the design process
- Contributing to the knowledge base

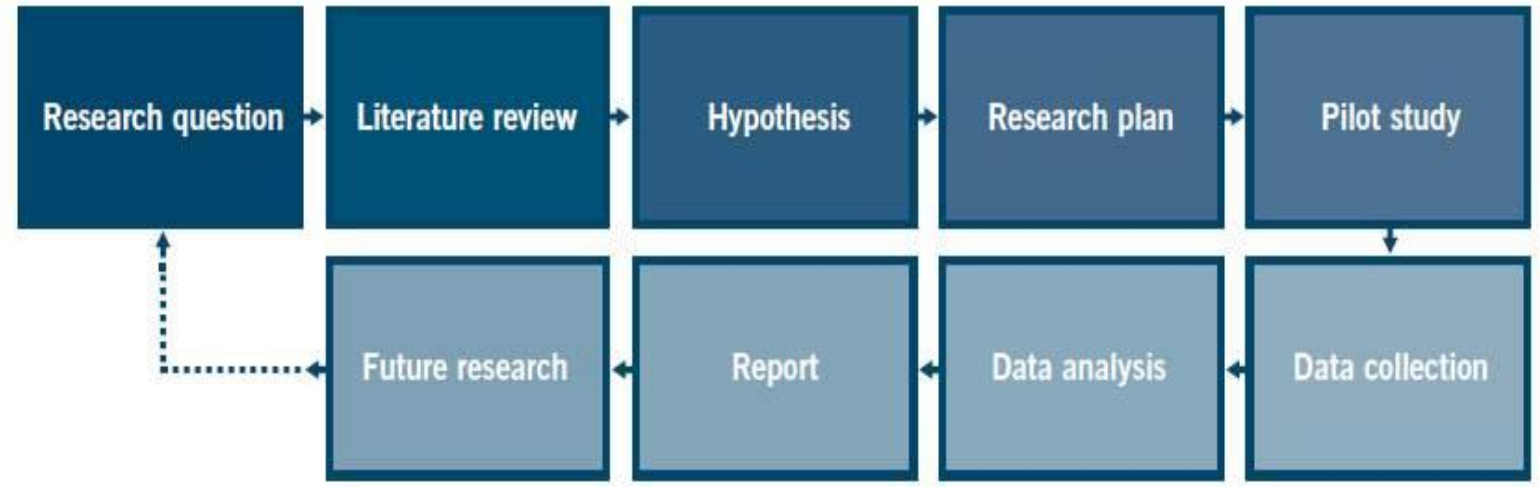
2011 Design Research Survey: Measuring Results

Post-occupancy evaluations	72.7%
Analysis before /after results	45.2%
Focus groups	31.7%
No formal evaluation	25.7%
Unsure how results measured	23.6%
Prospective studies	17.8%
Natural experiment	15.4%
Randomized control trial	7.8%
Ethnographic studies	6.5%

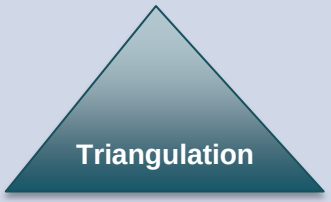
Two Groups of Research



Research Process Components



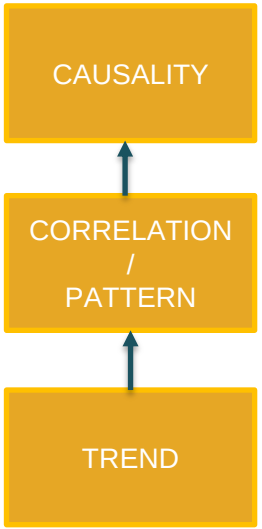
Research Plan - What Methodology Should be Used if the Team Plans to Conduct Research?

Quantitative	Qualitative	Mixed Methods
Explains and predicts phenomena by examining the relationship between empirically measured variables. This research tends to be confirmatory in nature, emphasizes deductive thinking which progresses from theories to hypotheses to data collection and testing.	Goal is to understand the complexity of the topics under study from personal perspectives, experiences, and interactions. It tends to be exploratory in nature and employs inductive thinking which progresses from specific observations to general inferences and theories. It is open ended and more flexible.	Does not commit to one single philosophical perspective and adopts methods from both quantitative and qualitative approaches. 

Learn Research Speak

VARIABLES:

- Independent Variable
- Dependent Variable
- Confounding Variable



Variable: Something that changes/varies

Dependent Variable: Depends on an external factor to change (e.g. Health outcomes: Falls, Infection, Satisfaction)

Independent Variable: Does not depend on external factor to change (e.g. Design feature: Flooring, layout, acoustics)

Confounding variable: A variable that may impact the change, but is not your focus (e.g. Age, Gender, Repeat visits). Some confounds you can control for, others you cannot.

Watch out for confounding variables. Ask about them.

Use Existing Metrics and Tools

Metrics routinely collected by a facility

- *NDNQI Metrics*
  - *Fall Rates*
  - *Infection Rates*
- *HCAHPS scores*
- *Patient Satisfaction Scores*
- *Readmission Rates*
- *LOS (Length of Stay)*
- *HAB Initiative (Harm Across the Board)*

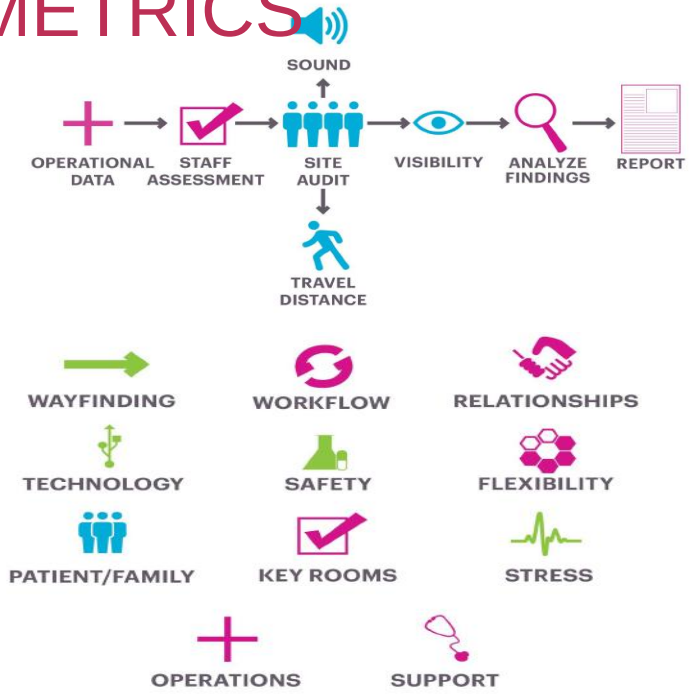
Design→ ← Outcome

Existing reliable and valid tools

- Psychometric Instruments
- Surveys
- Interview Protocols
- Checklists
- Tools used in published articles (contact authors)
- Parametric Planning and Space Analytic Tools

Don't reinvent the wheel

Close the Feedback Loop: GET OCCUPANCY METRICS



Source: Functional Performance Evaluation, HKS, 2014

An Opportunity

Healthcare transformation **demands design solutions** as a component of an **integrated approach** to resolve safety, quality, access and cost issues.

- **Solutions are informed from evidence** – **be prepared** to meet the owner's **expectations that the design team uses research**
- Make sure you **define your goals** – **design what you want to achieve**
- **Think beyond first costs –** understand the **business side** of the equation

The building itself is important, but is often unseen and unconsidered in the process to improve the delivery of safe, quality and cost-effective care!

An Important Tool in Design

Evidence-Based Design

Evidence-Based Design and EDAC

(Evidence-based Design Accreditation and Certification)

- The Center for Health Design's internationally recognized EDAC program awards credentials to individuals who demonstrate a thorough understanding of how to apply an evidence-based design process to the design and development of healthcare settings, including measuring and reporting results.
- The EDAC exam establishes standards and tests individuals on the proper process to follow.
- Use of the EDAC appellation distinguishes your knowledge and practice of EBD in

EDAC Mission and Vision

Mission: To develop a community of certified industry professionals through education and assessment of an evidence-based design process.

Vision: A world where all healthcare environments are created using an evidence-based design process.

EDAC was created to:

- Provide a definition of EBD and define a standard process for implementing EBD
- Establish expectations for individuals who will be using an EBD process
- Institutionalize EBD as an accepted and credible approach to improve healthcare outcomes

EDAC Exam

- 110 questions with stems, keys and distracters
  - Stem: May contain several sentences that provide background information and will end with a question. Read the stem carefully to avoid misunderstanding the question.
  - Key: The most appropriate/correct answer of the four choices.
  - Distracters: The other choices that may not be entirely incorrect, however, they are not the most appropriate/correct answer.

Types of Exam Questions

RECALL	APPLICATION	ANALYSIS
• Requires you to draw from memorized facts • Characteristics: The statement or question is short with one variable • Answers do not vary with the situation	• Asks you to consider how the EBD process is applied in various situations and requires you to interpret, classify, translate and recognize relationships between a situation or other variables • Characteristics: The statement or question will have more than one variable and will require careful reading and correlation of the answers • Answers vary based upon the situation	• Requires information synthesis, problem solving, analysis of the situation and selection of the best response. Look for key words and clues in the question or statement • Characteristics: The longest statement or question that require careful reading to establish the relationship between variables in the question and the answers • Answers vary based upon the situation

Sample Question

A project team is interested in reducing patient falls and increasing staff satisfaction in an existing inpatient unit. There are a variety of design changes that could be made to achieve these goals including a non-slip type of flooring, decentralized nurse station layout and installation of handrails in the patient room. Given the limited budget, what should the project team do **first** to determine where to invest its limited resources?

a) Select the design feature that is most in line with the evidence-based design goals.

b) Review data to determine the cost of patient falls and complete a business case.

c) Conduct a critical review of the existing research for each option.

d) Mock-up a patient room that includes the proposed design features

Answer

A project team is interested in reducing patient falls and increasing staff satisfaction in an existing inpatient unit. There are a variety of design changes that could be made to achieve these goals including a non-slip type of flooring, decentralized nurse station layout, and installation of handrails in the patient room. Given the limited budget, what should the project team do **first** to determine where to invest its limited resources?

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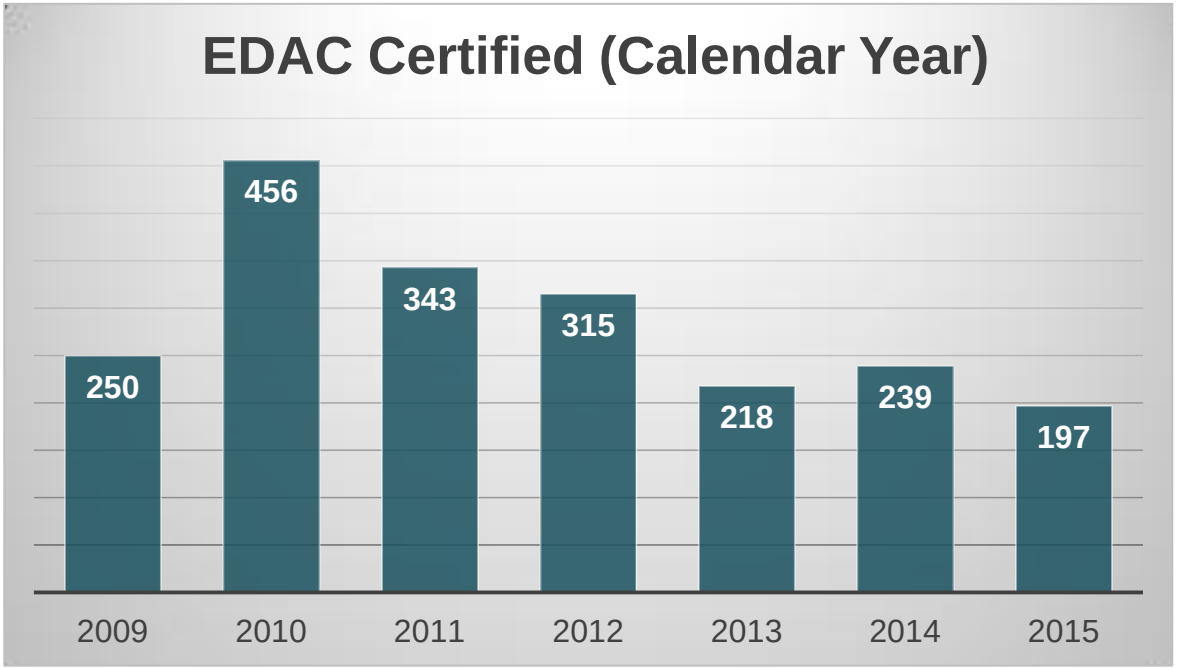
Preparing for the Exam

Read all three study guides to:

- Gain an overview about the healthcare industry
- Understand the trends and challenges that impact healthcare design
- Learn information about finding, using and conducting research
- Understand how to integrate the evidence-based design process

Certification



Total Certified:

2,018

Champion Firms

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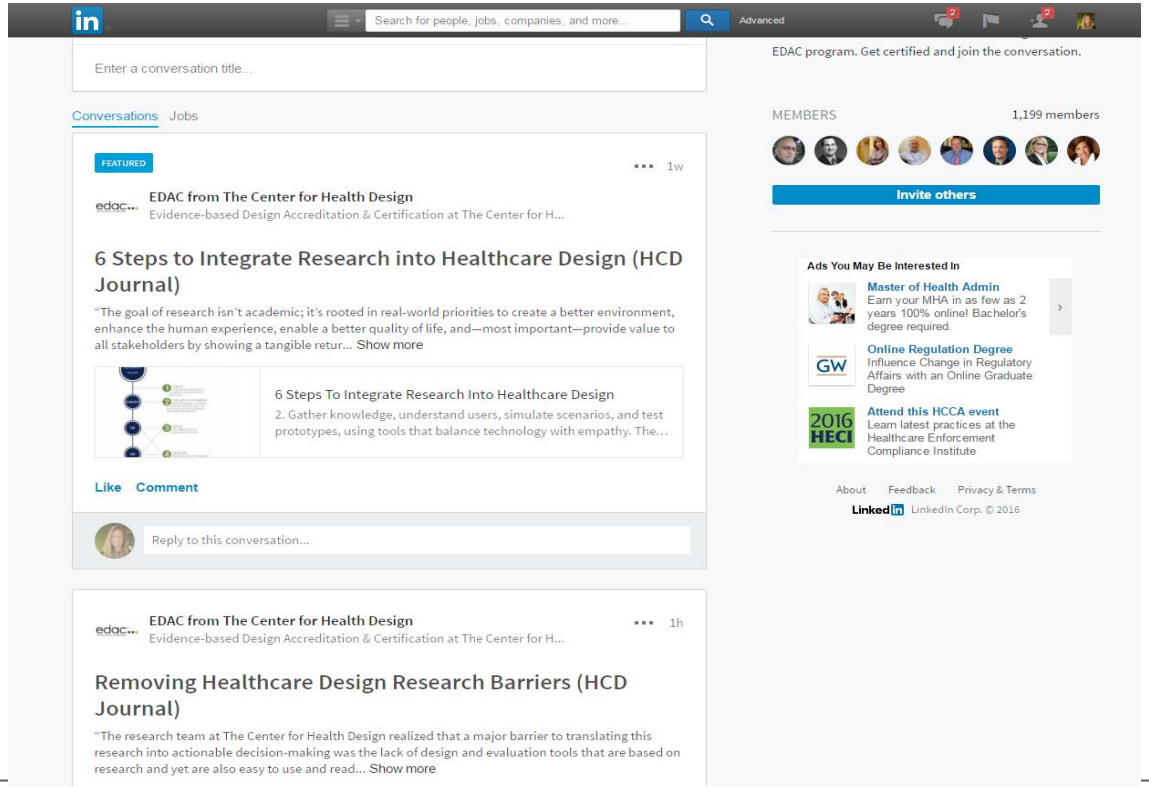
ZGF Architects / ZGF Cotter Architects Inc.

EDAC Linkedin Community

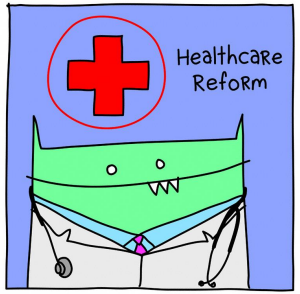


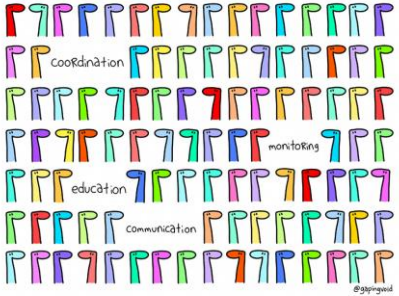
Resources and Tools

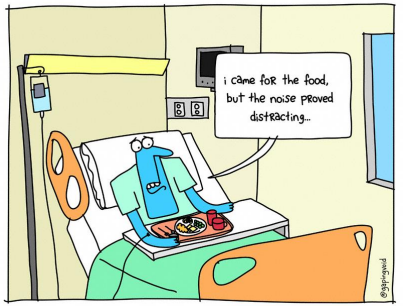
The Center for Health Design

THE CENTER FOR HEALTH DESIGN®

Topic-Focused Toolboxes







Toolbox Resources

Issue Briefs & Executive Summaries
Learn about the baseline of knowledge available to inform your understanding of specific topics.

Blogs
Informal discussions of key healthcare design issues.

Webinars
On-demand or live, featuring expert insights, case studies, and more.

Case Studies
Read stories and lessons learned from healthcare organizations who are working to improve patient and staff outcomes.

Infographics
Visual representations of key healthcare design topics.

Industry Resources
Learn about what others in the industry are doing about the pressing issues in healthcare today.

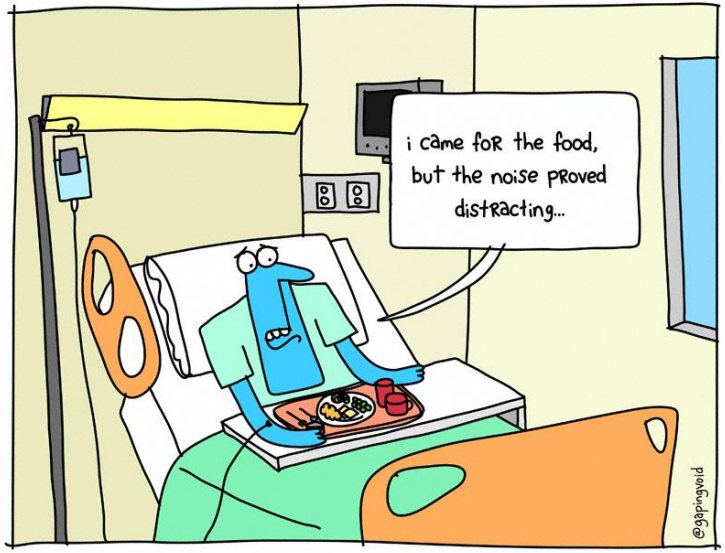
Interviews
Learn design strategies and other lessons from topic experts.

Design Strategies
Simple lists of design strategies and evaluation ideas.

Lessons Learned
Concise summaries of key takeaways from expert interviews.

Assessment & Planning Tools
Self-administered instruments to help evaluate design needs and opportunities.

Toolbox Examples



Noise

Noise affects patient safety and health, and is an important part of the patient experience.

Patients often complain about noise levels during their hospital stay, but there are many interventions available to support a healthier and more comfortable environment.

Interviews

Going Beyond a "One-Size-Fits-All" Solution

Susan E. Mazer, PhD

You're talking about a culture change to teach people to be quieter and more sensitive to those around them.

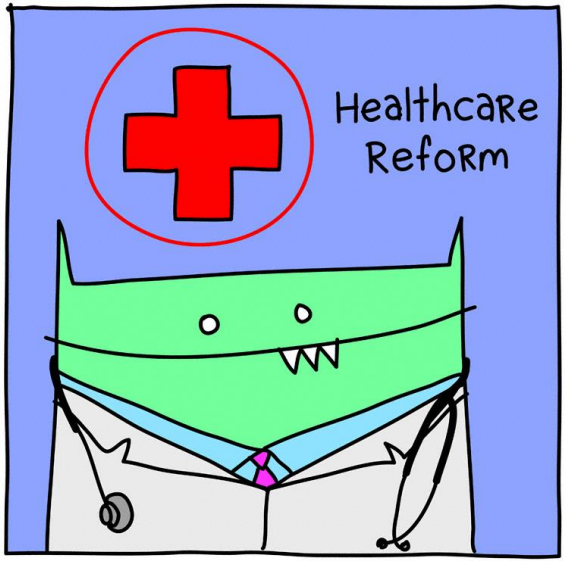
"…Create a culture that does not tolerate inappropriate noise…If you visit the Vatican or the Duomo in Florence, hundreds of people are walking through, and they are all whispering. The church itself demands quiet…Every culture, and every hospital, has its own sound, its own values and tolerances."

Toolbox Examples

Healthcare Reform

Healthcare reform is in full swing with the 2010 Patient Protection and Affordable Care Act (ACA), providing many opportunities for the built environment to be a driving force in better outcomes.

Organizations are incentivized to improve the quality of the built environment, which can be accomplished by taking a comprehensive look at facility design, operational decisions, staff training, and care delivery and how they relate to outcomes.



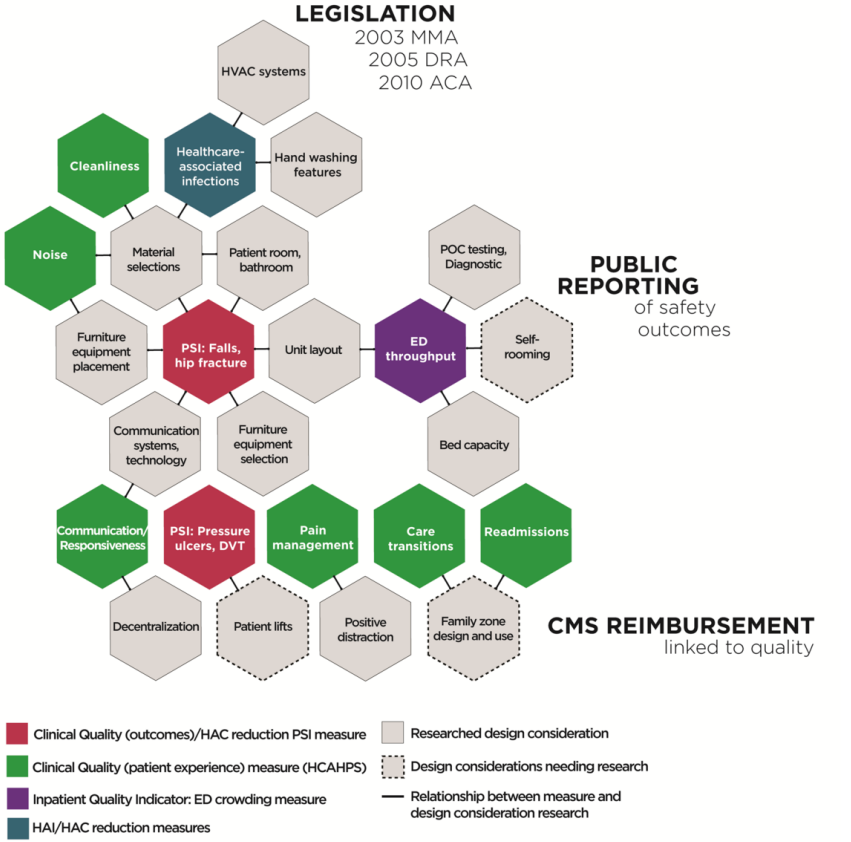
Issue Briefs

Quality Care, Legislation, & Design

① Linking Legislation to Design

② Legislative Programs: The Narrative

① Opportunities for Built Environment Design: More Research Needed



Resources

Case Studies

New Medical Center Takes a Comprehensive Approach to Healthcare, University Medical Center of Princeton, *Plainsboro, NJ*

The Question

How can a facility anticipate the changing healthcare market and establish programs and services to adapt to new reimbursement structures?

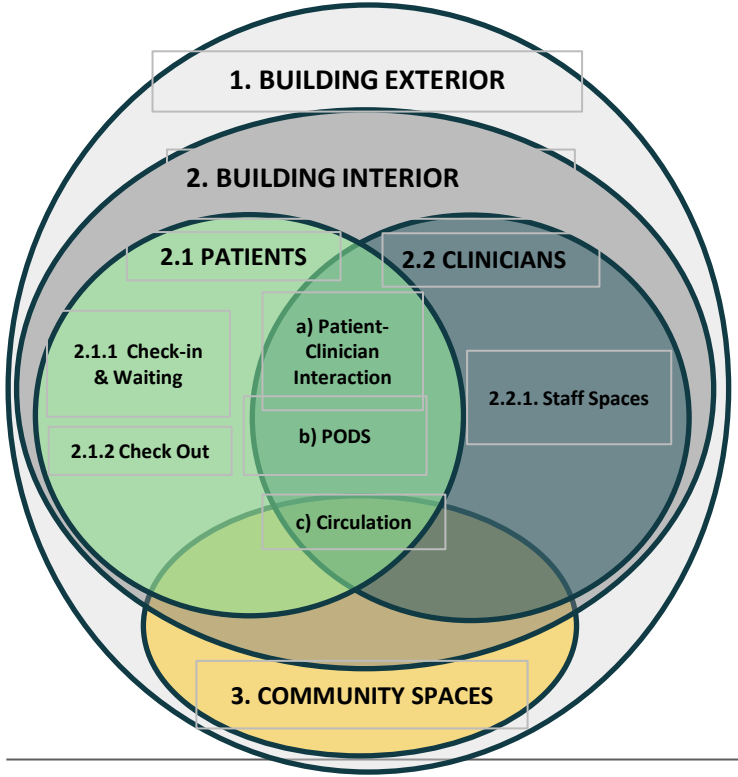
The Goal

To provide a comprehensive spectrum of patient-centered, state-of-the-art medical services and wellness programs in the safest and most efficient manner.

Assessment and Planning Tools

- Patient-Centered Medical Home Design Evaluation Checklist
- Environmental Cleanliness Checklist
- **Ambulatory Care Center Design Tool**
- **Design Insights & Strategies Tool**
- Patient Room Design Checklist and Evaluation Tool
- Clinic Design Post-Occupancy Evaluation Toolkit
- **Safety Risk Assessment**
- My Safety Net Clinic
- A Healthcare Reform Primer
- Ideas to Improve Nurse-Patient Communication
- Hand Hygiene Evaluation Checklist
- Ideas to Reduce Noise

Ambulatory Care Design Tool



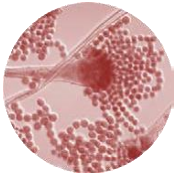
The tool supports design teams in making key design decisions about ambulatory care centers linked to evidence based design goals and principles. Organized in categories:

1. Building exterior
2. Building interior
3. Community spaces

Design features are prioritized based on goals, agreements, limitation, or decisions of the design team.

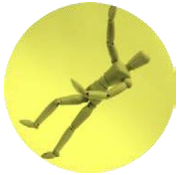
Safety Risk Assessment Toolkit

Infection Control



Patient Handling

Falls



Medication Safety

Behavioral Health

Security

Goal & Purpose

To help design teams proactively identify and mitigate built environment conditions that impact patient and worker safety in healthcare environments. Created to support the 2014 FGI Guidelines for Design and Construction of Hospitals and Outpatient Facilities.

Funded by the Agency for Healthcare Research and Quality

Design Insights & Strategies Tool

Goal & Purpose

This is a set of interactive diagrams that provides access to the healthcare design evidence based in an accessible and actionable format.

Available for medical-surgical rooms, intensive care rooms, and maternity care rooms.

Funded by the American Society of Interior Designers and The Donghia Foundation. Renderings by BSA Lifestructures.

Knowledge Repository

www.healthdesign.org/search/articles

3,500+

References

500+

Key Point Summaries

FGI FACILITY GUIDELINES INSTITUTE

RESEARCH · DESIGN connections

NIHD Nursing Institute for Healthcare Design
INSPIRING AND EDUCATING NURSES

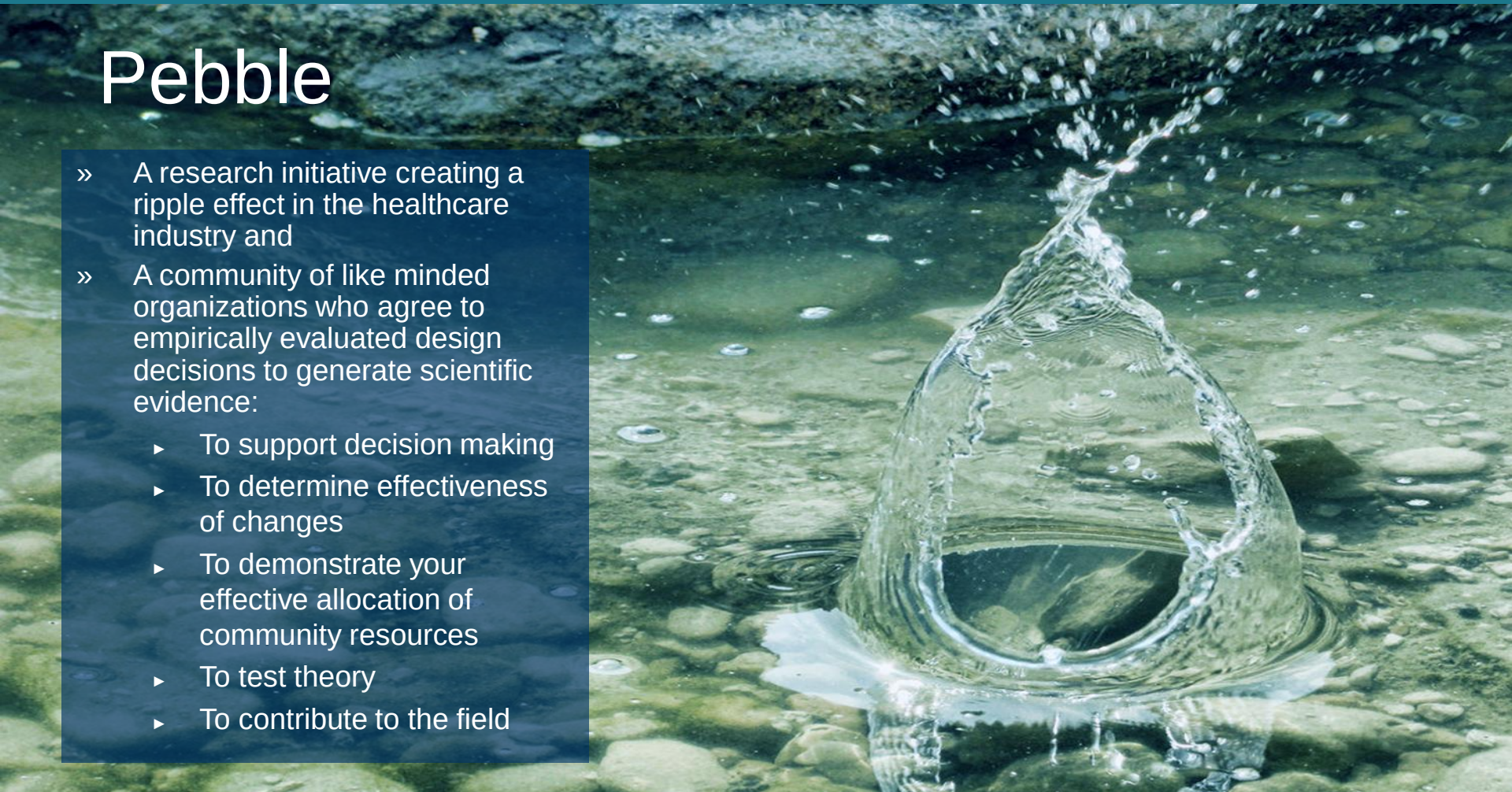
ASHE American Society for Healthcare Engineering of the American Hospital Association

AIA

ACADEMY of ARCHITECTURE for HEALTH FOUNDATION

Pebble

- A research initiative creating a ripple effect in the healthcare industry and
- A community of like minded organizations who agree to empirically evaluated design decisions to generate scientific evidence:
  - To support decision making
  - To determine effectiveness of changes
  - To demonstrate your effective allocation of community resources
  - To test theory
  - To contribute to the field



Healthcare is complex and therefore there is no single solution that works every time.

Questions?

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