

# LEAN IN DESIGN FORUM

MAY 27-28, 2020

## Lean and Evidence Based Design: Where to Begin



Donna Deckard, Center for Health Design - Andrea Sponsel, BSA LifeStructures - Terri Zborowsky, HGA

May 27, 2020

EXPLORING EQUITY, DIVERSITY AND INCLUSION IN HIGH-PERFORMING TEAMS

# Who We Are



**Donna Deckard**  
The Center for Health Design  
Director of Strategic Projects



**Andrea Sponsel**  
BSA LifeStructures  
Director of Lean Strategy



**Terri Zborowsky**  
HGA  
Design Researcher

# Agenda



- What is Lean + EBD? Definition of EBD
- How do I know Lean + EBD is right for the project?
- Create Alignment
- Know Your Audience
- Why do they work together?
- Case Study
- Lean + EBD Toolkit

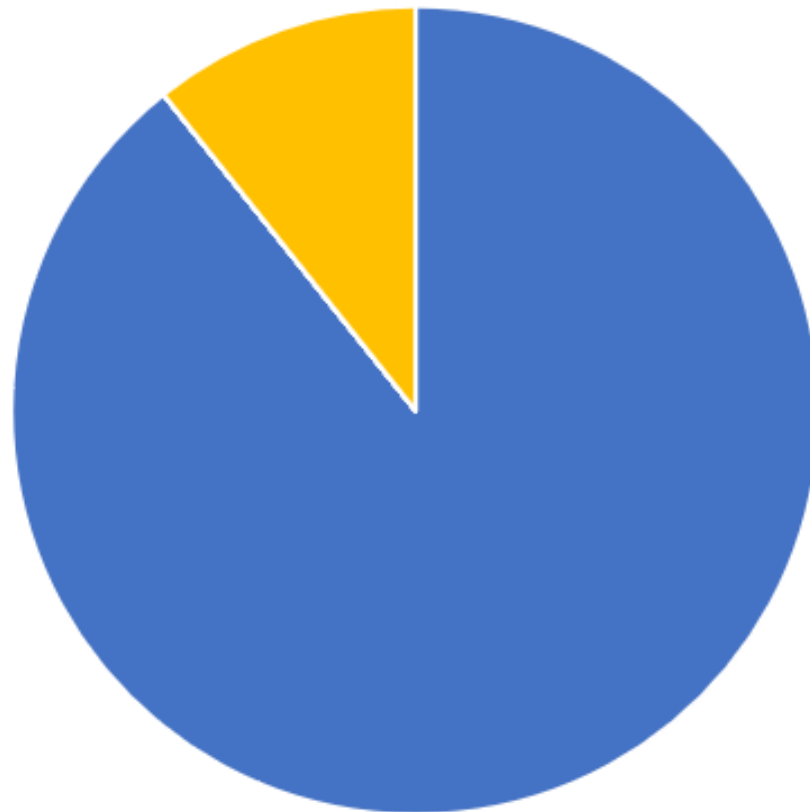
# Who You Are



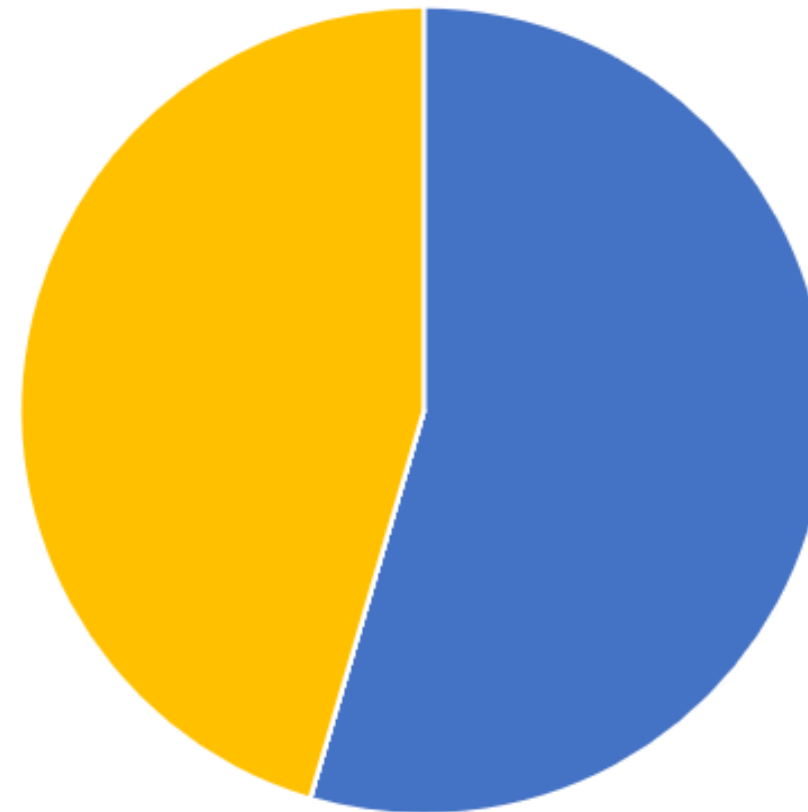
- Architect
- Interior Designer
- Engineer
- Researcher
- Contractor
- Trade Partner
- Consultant
- Other

# The Opportunity

## Manufacturing



## Design/Construction



Productive



Waste



# Why should our industry care?



## The concept and design phase is where the most project value can be gained... or lost

- Build only what is needed
- Maintain a life-cycle perspective
- Strengthen scenario planning
- Optimize around site constraints
- Think modular design and standardization\*
- Consult construction and procurement teams
- Optimize engineering processes and choices

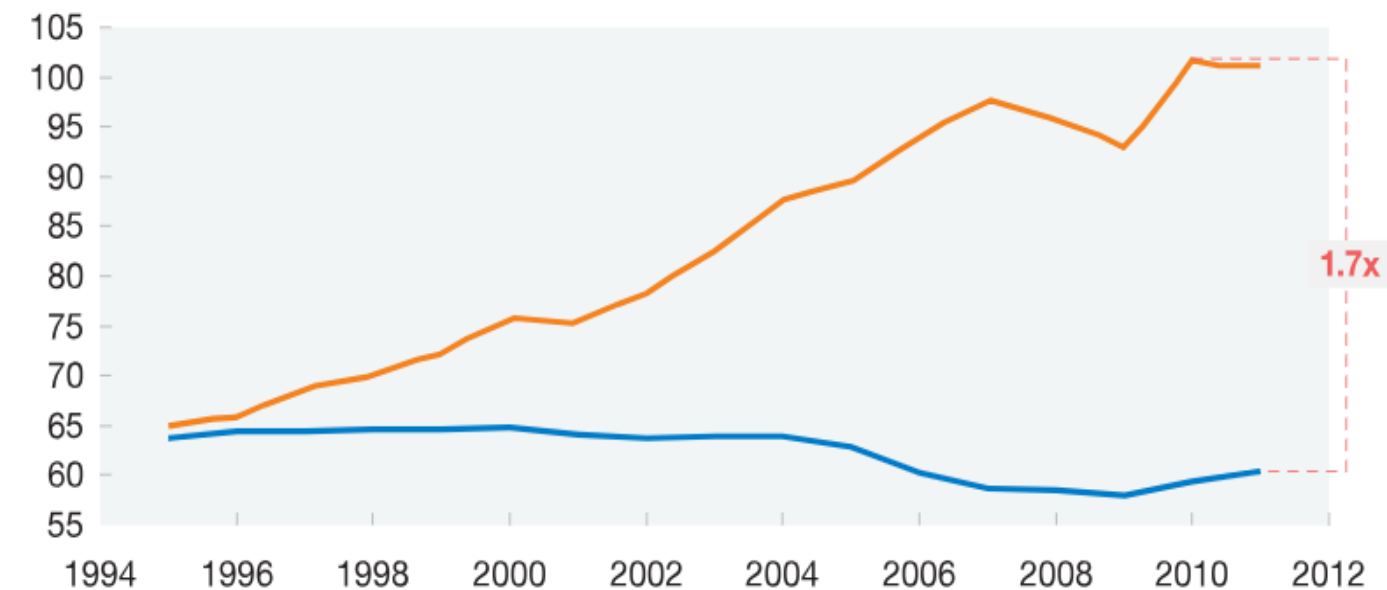
© McKinsey&Company – July 2015

### Overview of productivity improvement over time

Productivity (value added per worker), real, \$ 2005

— Manufacturing  
— Construction

\$ thousand per worker



Source: Expert interviews; IHS Global Insight (Belgium, France, Germany, Italy, Spain, United Kingdom, United States); World Input-Output Database

# Traditional vs. Integrated



## Traditional Design and Construction

- *Jumping in without Defining the Problem*
- *Surprises*
- *Design Schedule Defined by Arbitrary Milestones*
- *Waiting for Bids before you know the Cost of the Project*
- *Siloed Communication*
- *Value Engineering*

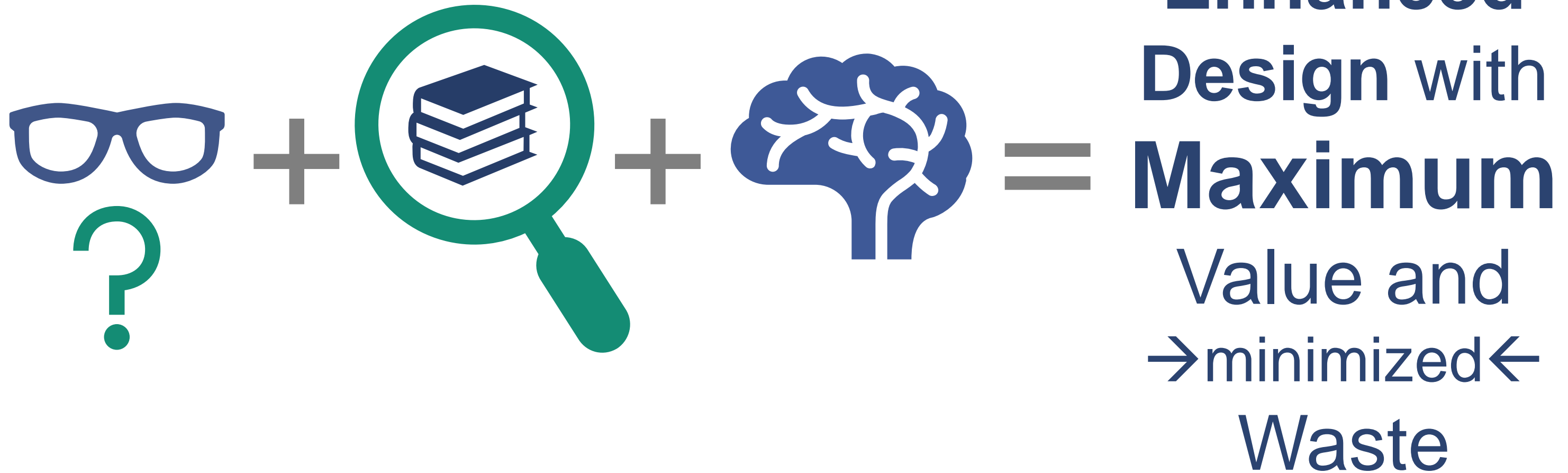
© Lean Construction Institute

## Integrated (EBD + Lean) Design and Construction

- Alignment with Client Goals
- Relevant Research Utilized to Improve Challenges
- Stability/Predictability of Projects
- Identifies and Removes Waste
- Safer Projects
- More Collaboration and Innovation
- Continuous Improvement – New Insights Gained
- Makes the project **FUN** again!

MAY 27–28, 2020

# What is Lean + EBD?





# How do I know Lean + EBD is right?



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- Your client is ready to look at their **processes** and how they **inform design**.
- Your client is willing to spend **time up front** with data gathering **to produce a better design**.
- You're ready to invest time into **linking design to measurable outcomes**.
- You're ready to **prove** your designs are good.

## EVIDENCE-BASED DESIGN

IS THE PROCESS OF **BASING**

**DECISIONS** ABOUT THE BUILT

ENVIRONMENT ON **CREDIBLE**

**RESEARCH** TO ACHIEVE THE

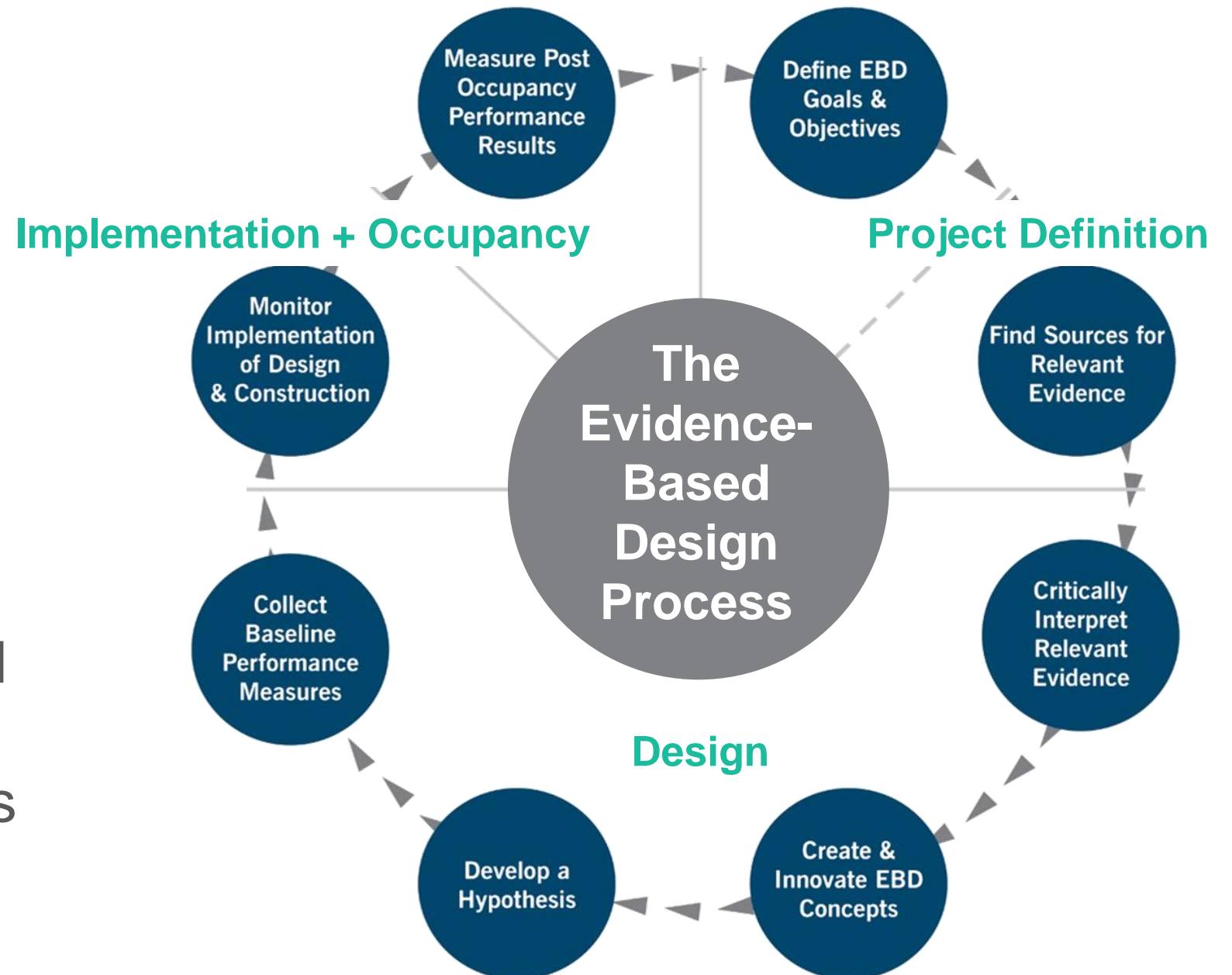
**BEST POSSIBLE OUTCOMES**

# Evidence-Based Design Process



## 8 Steps integrated into Design/ Construction/Occupancy

- **Process** helps designers understand issues our clients face and can show needs they didn't know they had
- **EBD** practices can prioritize and create measures of success for outcomes based on those needs



# Step 1 - EBD: Define EBD Goals and Objectives



**Uncover Challenges.**

**Collect Relevant Insights.**

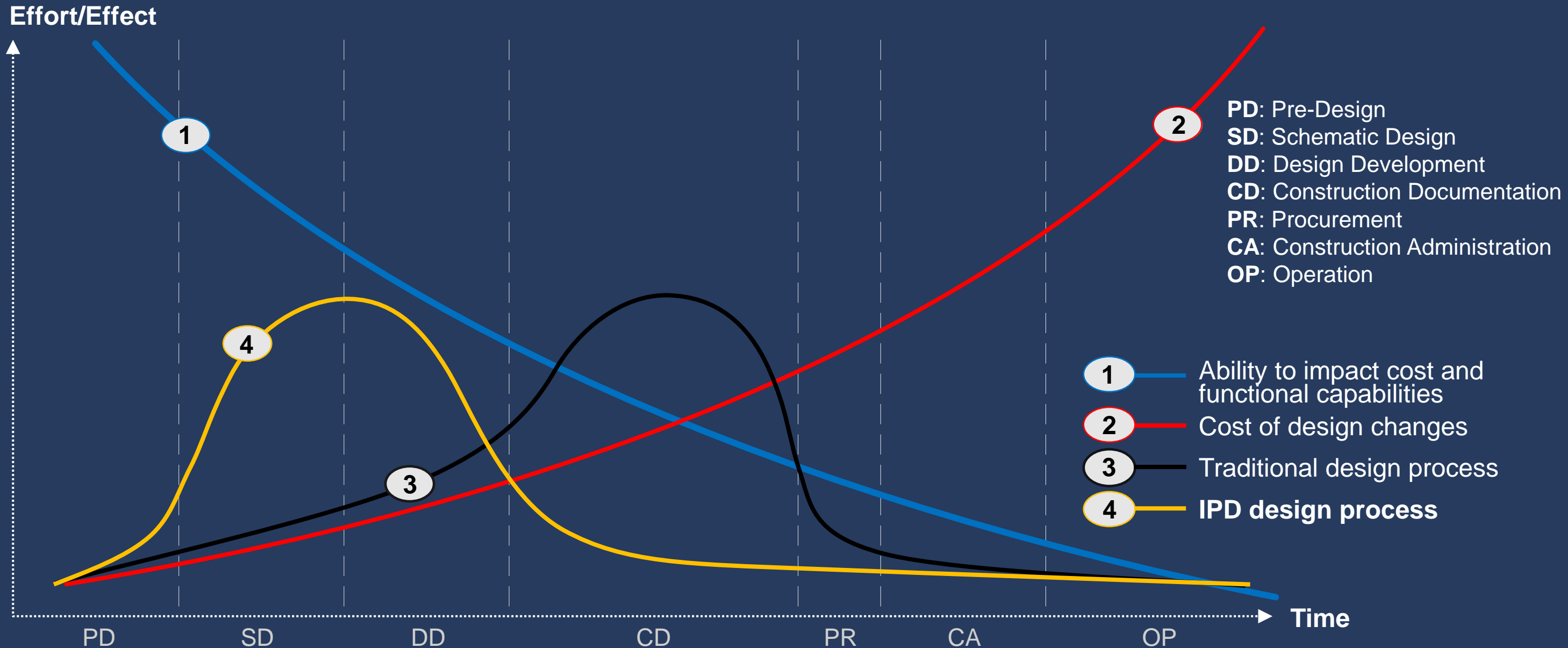
**Define the Why.**





- Appeal to what keeps them up at night
- Gear your message towards your audience – Hospital Administration, Providers, Clinicians, Facilities, Design+Construction
- Build a Business Case they can't ignore

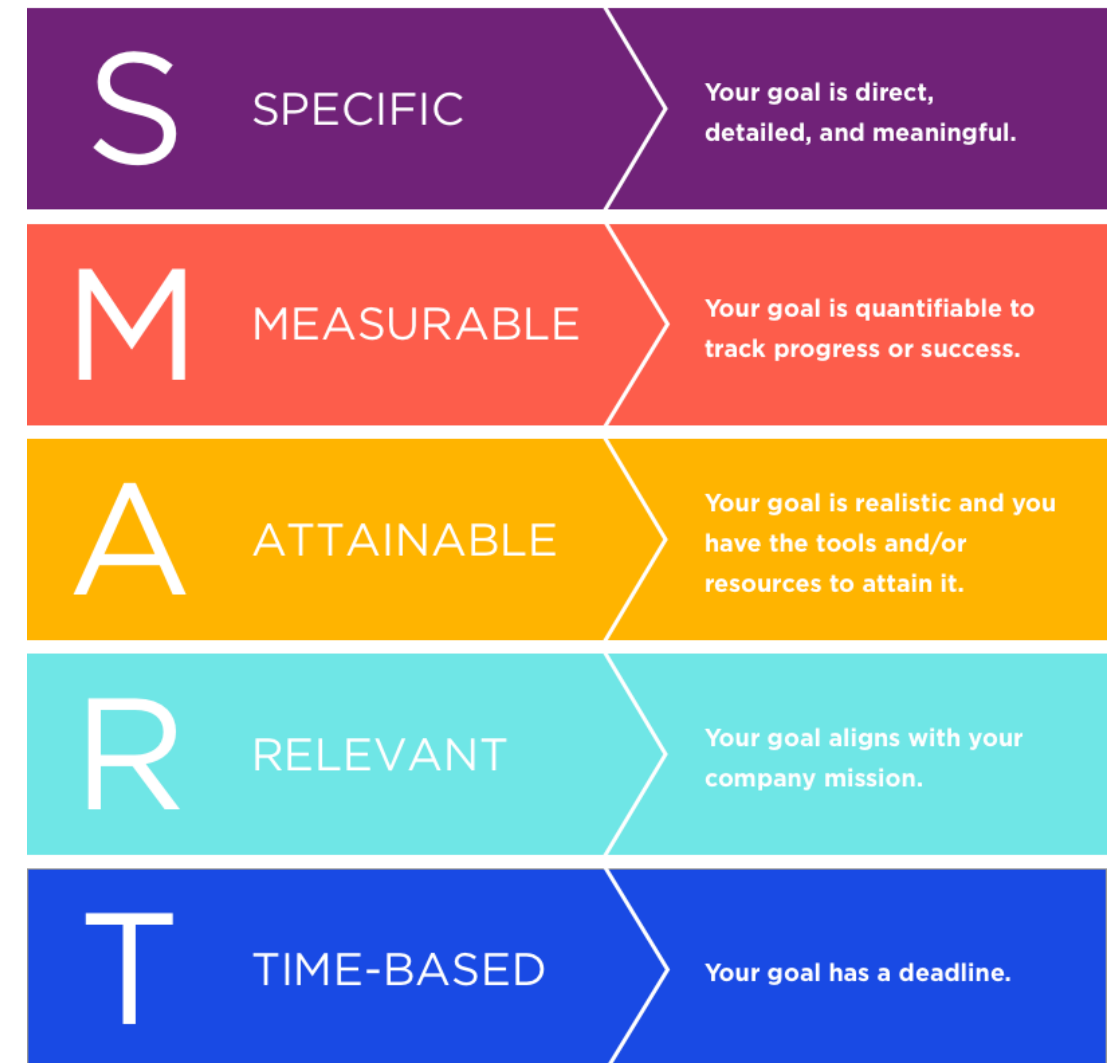
# Early Engagement





# Create Alignment

- Make the effort inclusive of all team members and observation + research based
- Take time for project and team alignment
  - Establish **Values**
  - **Define Success for every Stakeholder** (Owner, User, Researcher, Designer + Builder, Community)
  - Talk about the **Driving Forces** (opportunities) and the **Restraining Forces** (risks)
  - Create **SMART** goals



- **Linking research and design is at the core of EBD.**
- Research can support design decision making.
- Research can evaluate the success of design innovations.
- Research aims to add to the body of knowledge.

**The goal is to use facility design to help improve outcomes.**

# Step 2 - EBD: Find Sources for Relevant Evidence



**Define the Research Question.**

**Search for Evidence.**



# Where to Look



***...Consider a Knowledge Manager!***

# The Knowledge Repository



A complete, user-friendly library of healthcare design resources that continues to grow with the latest research.

- Online decision-making tool
- 4700+ citations
- 839 key point summaries (KPS)
- Acute, Residential & Ambulatory Care citations
- 76 full articles available
- 54 CHD produced articles available

<https://www.healthdesign.org/knowledge-repository>





# Resources



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## COVID-19 resources for healthcare facilities and designers

### INTERACTIVE DESIGN DIAGRAMS

A link between design strategies and outcomes

### SAFETY RISK ASSESSMENT

A process to mitigate risk

### KNOWLEDGE REPOSITORY

Free journal citations

### JOIN THE CENTER

... and learn how to network and access the research, tools, resources and expertise you need to meet your professional development, organizational or project goals.

When you join The Center, you will:

- Stay current on advances in evidence-based facility design
- Stay connected with a community of

### MOVING HEALTHCARE FORWARD

- Behavioral Health
- Communication
- Impact of Aging
- Infection Control
- Noise

### WHAT'S NEW

COVID-19 RESOURCES FOR HEALTHCARE FACILITIES

[Minimize the impact](#)



**VOICES OF THE INDUSTRY**  
Convened by The Center for Health Design  
3 Dialogues Examining COVID-19 and the Built Environment  
[LEARN MORE AND REGISTER](#)

[www.healthdesign.org](http://www.healthdesign.org)

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## COVID-19 Resources for Healthcare Facilities

Listed below are select resources available on The Center for Health Design's website, as well as from partner organizations, to help healthcare facilities address near-term needs related to the current COVID-19 pandemic, as well as to better inform plans and projects in development now and in the future. While these resources were created to help minimize the impact of infections and transmittable diseases in healthcare facilities, much of the research and guidance is relevant and useful in any built environment.

We hope you find these resources informative and helpful as you navigate these uncertain days, and that you and yours remain in good health.

### MakingRoom

Online database connecting hotels with hospitals in urgent need of additional space

Created to provide hospitals and other care providers with a forum to communicate their space needs; and for hotels and others with multi-unit or high-occupancy residential facilities to indicate their capacity and willingness to consider these urgent needs. [Submit space needs or availability via online forms: view real-time posted needs and availability lists.](#)

### The Latest Information

During this rapidly evolving pandemic, we will be posting the most recent relevant research, in addition to links to our library of related resources such as infection prevention and telemedicine. These materials have been made available quickly (and often at no charge) to advance our understanding of COVID-19, but not all of the studies in press have gone through peer review.

**COVID-19 (SARS-CoV-2)-Specific Research** (also listed in our [Knowledge Repository](#) - search COVID-19)

**Guidance for building a dedicated health facility to contain the spread of the 2019 novel coronavirus outbreak**

This "in press" study by Agarwal and colleagues outlines elements of design of a dedicated unit for epidemics (such as Ebola), but the paper addresses COVID-19 specific requirements to be considered.

[SOURCE LINK](#)

**Fangcang shelter hospitals: A novel concept for responding to public health emergencies**

This health policy paper by Chen and colleagues, published in The Lancet, describes the large-scale, temporary alternative care site hospitals (for example, stadiums and exhibition centers) to isolate patients with mild to moderate COVID-19.

[SOURCE LINK](#)

**2019 Novel Coronavirus (COVID-19) Pandemic: Built Environment Considerations To Reduce Transmission**

This study by Dietz and colleagues synthesize the built environment research that addresses microbiology and what is currently understood about SARS-CoV-2 to provide actionable guidance to decision makers.

[SOURCE LINK](#)

**Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1**

This Letter to the Editors of the New England Journal of Medicine from van Dormalen and colleagues reports the CDC and NIH results of a laboratory controlled experiment to evaluate how long the viruses remained viable on plastic, stainless steel, copper, and cardboard. You may have heard this discussed on the news – this is the original report.

[SOURCE LINK](#)

**Severe Acute Respiratory Infections Treatment Centre**

This World Health Organization Practice Manual provides guidance to set up and manage a severe acute respiratory infection (SARI) treatment centers and screening facilities in healthcare settings to address the COVID-19 pandemic. This work is available under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO license (CC BY-NC-SA 3.0 IGO; <https://creativecommons.org/licenses/by-nc-sa/3.0/igo>).

[DOWNLOAD PDF](#)

**Transmission Potential of SARS-CoV-2 in Viral Shedding Observed at the University of Nebraska Medical Center**

This "in press" study by Santarpia and colleagues suggests COVID-19 may be spread through both direct (droplet) as well as indirect contact (contaminated objects and airborne transmission).



# Other Research

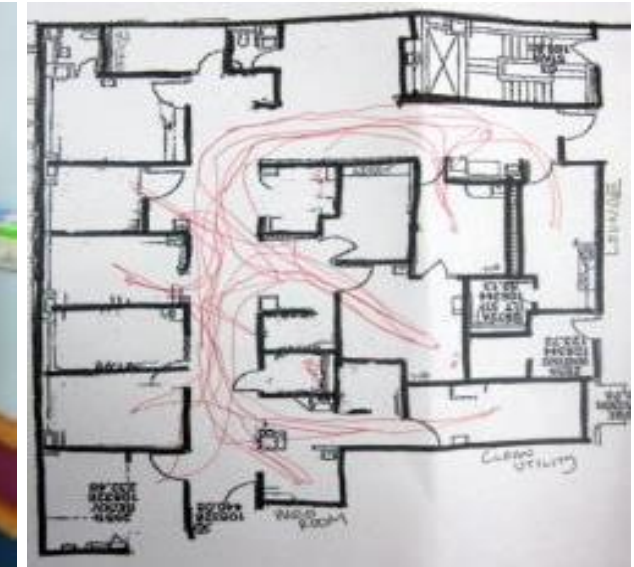
- Benchmarking
- Case Studies
- Site Visits





# Go to the Work

- Problem solving is more effective at the place and with the people having the problem
- Track the people, product and information flow



A3 #	Title	Revision	Champion	Date Started:	Collaborators/Participants	Approved by:	Approved Date:	Status
CA201	Cancer Center Gemba – Inpatient Areas	0	Rachel Knox	12-17-15	Chris Finch, Erin Laurenzi, Lisa Barton, Lauren Reeves, Shiela Hall, Tony Bernardini, Lauren Hegger, Jennie Evans, Brent Willson, Kristy Venrick, Rachel Knox			<input checked="" type="checkbox"/> Development <input type="checkbox"/> Collaborative review <input type="checkbox"/> Implementation

**BACKGROUND:**  
Methodist University Hospital is building a new patient care tower, that will expand or replace several services including, surgery, imaging, sterile processing, pharmacy, patient beds, cancer center, and transplant center.

**CURRENT CONDITION:**  
The inpatient cancer beds for ages 18 to 90 years of age are located in several areas of the hospital:

- Surgical Oncology – 2<sup>nd</sup> Crews – 23 bed unit, recently renovated
  - Patients are direct admit to Oncology
  - Pod B – 10 – preparing for telemetry beds -
- Medical Oncology & Malignant Heme
  - 4 Crews, A pod, 1:5 ratio
  - Includes telemetry and central monitoring
  - Room 452 is a suite for room 453 – VIP, end of life, etc
- BMT unit – 41 allogeneic / autologous / have some 2 mismatch
  - 12 beds, 1:4 ratio, but trying to get to 1:3
  - ALOS is 14.5 to 30 days. Trying to decrease to 10 days.
  - All positive pressure; 1 room is negative with ante room
- Staff includes mid-level for regular oncology, each MD has a mid-level assigned, a case manager and social worker are assigned to Pod A and B. Unit coordinator for both pods.

**GOAL (TARGET CONDITION):** GOAL STATEMENT (3-6 months, measurable goal, align with Problem Statement)  
The goal of the gemba is to use current state observations to provide a frame of reference for the design team, and identify opportunities for improvement in the departments' future state spaces and operations.

**ROOT CAUSE ANALYSIS: (Problem Cause)**

- Patients are direct admit to Oncology, from ED or clinic
- Clean Supply – no charge system; supplies charged to unit; patients charged flat rate; special requests are made through Corner
- Nourishment – Coffee, Micro, countertop ice, sink, ref/frz, some snack storage. Room has locked door with small vision panel.
- Equipment – not enough storage; using corridors and repurposed patient rooms
- Meds – exchange cart (daily), plus hourly delivery, single omniceil, UC ref, and disposable storage

**BMT unit**

- All visitors asked to wash up in a handwashing sink at entrance to unit
- Physicians conference room – 2 computers and 1 table; used by physicians
- 12 beds, 1:4 ratio, but trying to get to 1:3

**Homework/Follow-Up**

	What	Who	Promise Date
1	Return HKS information request	MUM	5/5/16
2			
3			
4			
5			
6			

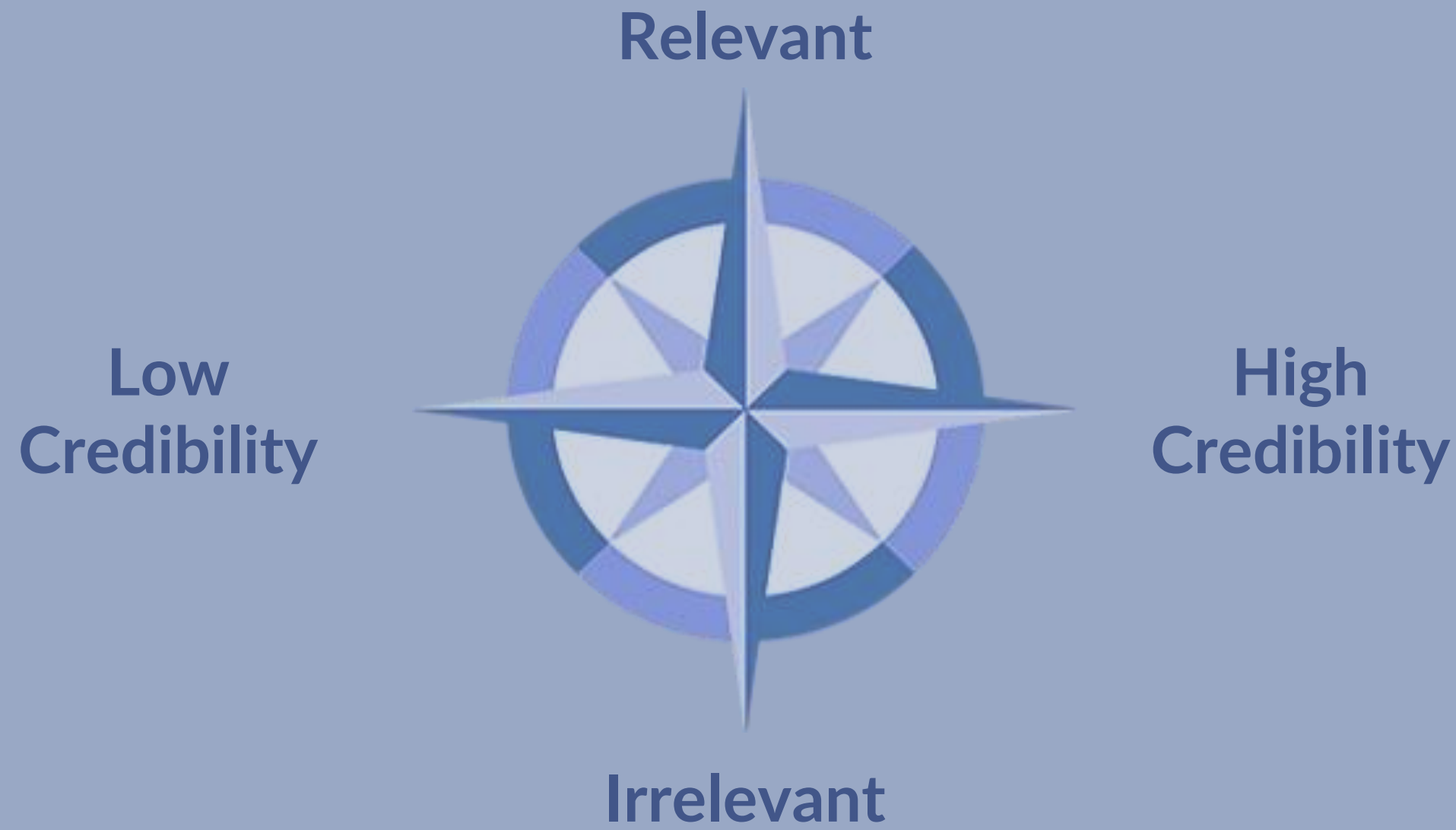
# Step 3: Critically Interpret Evidence



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# Step 4: Create and Innovate Design Concepts

**Evaluate the Strategies  
against Project Goals,  
Vision and Research  
Questions.**

**Some will be better  
than others.**






# Map the Experience or Process

- Understand the experience or process and where improvements can be made
- Identify waste and improve it with operations and/or space
- Document the Current State with an A3 to start the problem solving process



A3 #	Title	Champion	Collaborators	Status
MA101	Microarray - Isolation	Jackie Foy	Kay Townsend	
		Date Opened 08.13.19	Andrea Sponsel	

**BACKGROUND:**  
The Cytogenetics Lab is moving out of Crown Center as part of a larger campus move with the opening of the Research Tower and backfill space made available on the Hospital campus.

**CURRENT STATE - CLARIFICATION OF THE PROBLEM:**



**POINT OF CAUSE - ROOT CAUSE ANALYSIS:**

**EQUIPMENT NEEDS:**

- x2 50 ovens
- 7500 QPCR machine with computer printer
- Microarray scanner (not used)
- Microarray system (not used)
- ref. for x2 thermocycler
- nanodrop, gel imager, RO system
- x4 radio
- fluorescence
- fluorescence
- fluorescence
- x2 large centrifuge
- x2 steps
- add another full pipe
- add

**FUTURE STATE RECOMMENDATION:**

- Need more space in Pre-Room
- Microarray system needs to be closer to the process
- The laminated card is a circular path and a lot of travel/walking

**PARTICIPANTS:**  
Susan Cain  
Deb Faller  
Julie Joyce  
Barb Mouron  
Lisa Warren  
Lee Zellmer

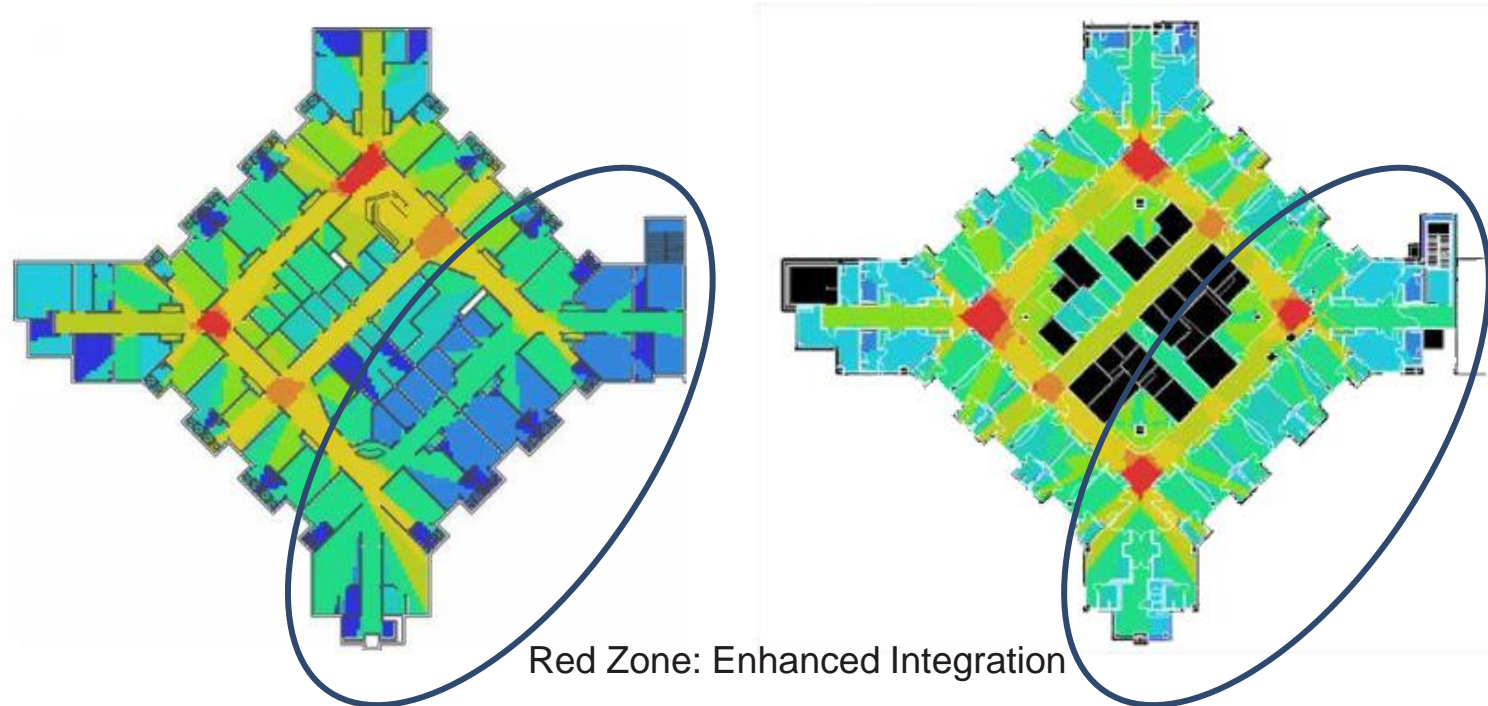
Dave Krug\*

Jackie Foy  
Andrea Sponsel  
Kay Townsend

\*partial meeting attendee

BSA

# Design - Test It - Prototyping



- Enables design team to bridge the gap of understanding with end users
- Allows end users to test operations to improve functionality, decrease square footage of rooms and optimize layout within rooms
- Allows the entire team to work out details in the room before construction commences or continues





# Step 5 - EBD: Develop a Hypothesis



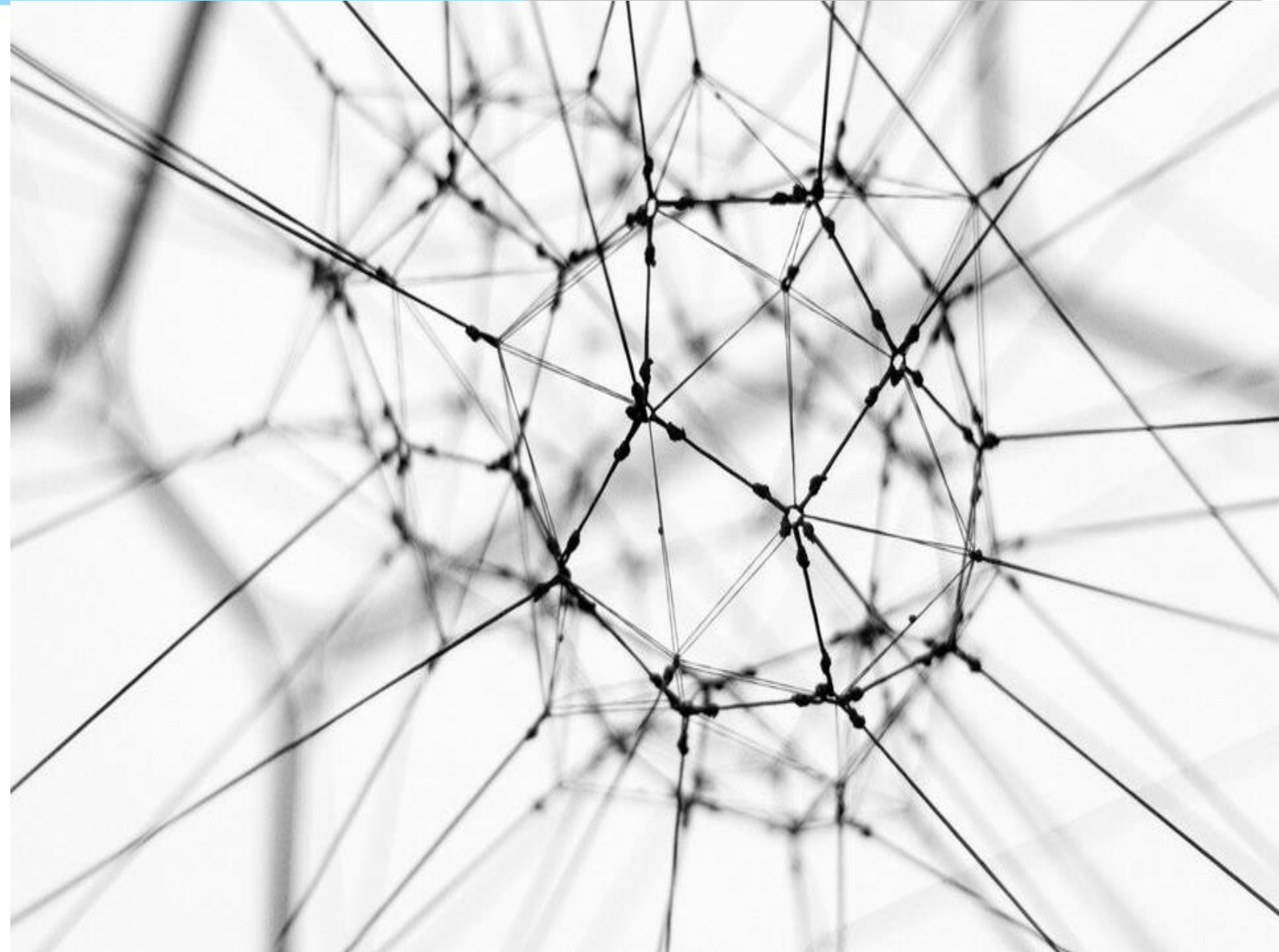
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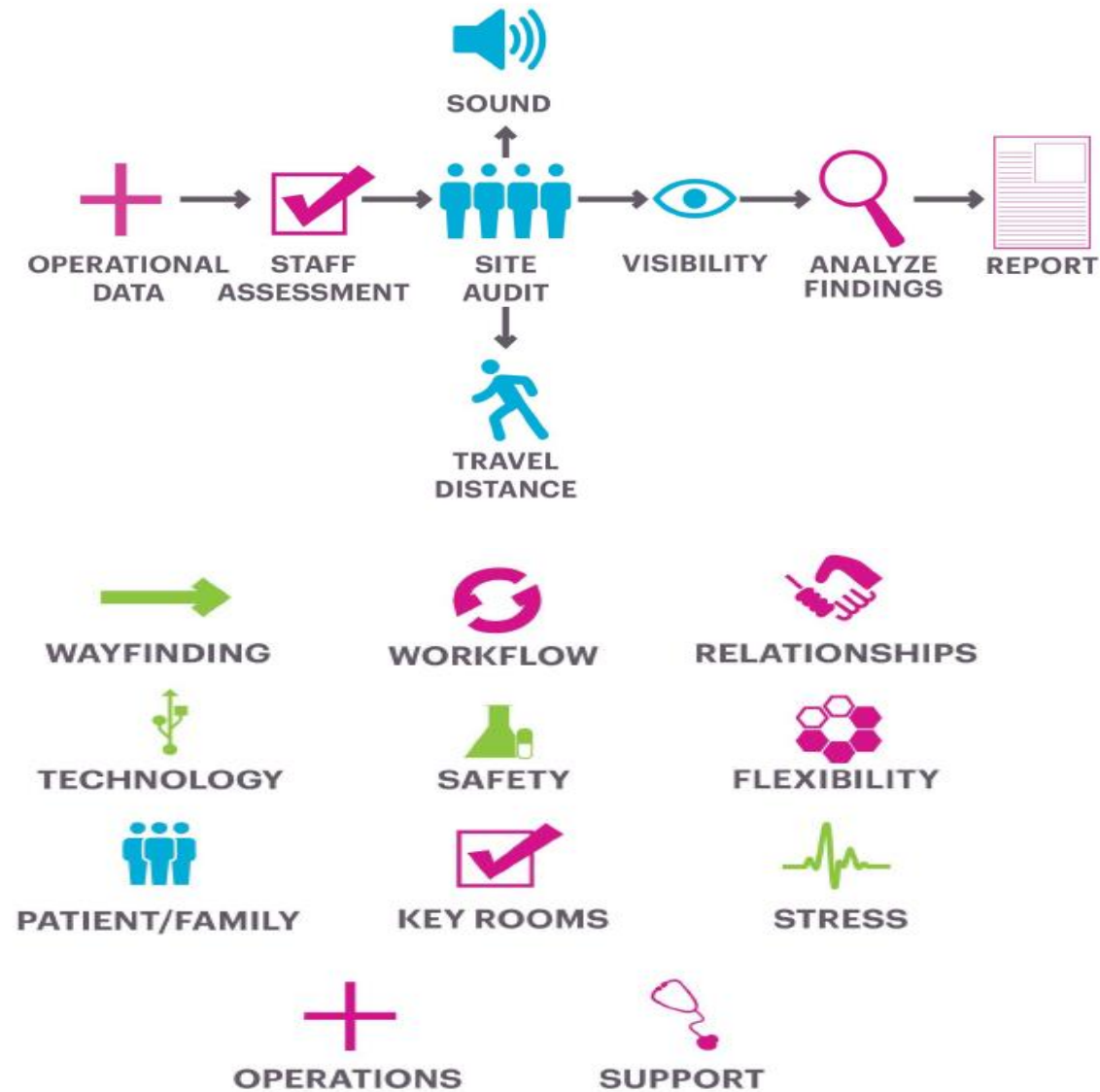
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- Hypotheses indicate or predict the **relationship between the design strategy** (independent variable) **and the outcome** (dependent variable).
- **Define your metrics.**



# Step 6: Collect Baseline Metrics



light



sound



distance

Source: Functional Performance Evaluation, HKS, 2014



# Step 7: Monitor Implementation of Design and Construction





# Step 8: Measure Post Occupancy Results



## The objectives of a POE are to:

- Provide feedback to design teams
  - Clarify programming issues and fine tune a facility
- Research effects of buildings on their occupants
- Provide information to support future designs and repetitive facilities
- Verify effectiveness of prototypes and innovations
- Justify design decisions and expenditures

Photo credit: Tim Gouw

# Merging Methods

## Pre-Design

## Schematic

## Development

## Documentation

## Post-Occupancy

### Lean

- Go to Gemba
- Develop Data-Driven Metrics

- Develop Future-State Operational Models
- Rapid Prototyping
- Strategic Space Program

- Evaluate and Assess Prototypes and Mock-ups with Metrics

Set Optional Standards & Goals  
Special Project Support (Missing Link)

- Metrics Evaluation
- Performance Report of Improvements and Continuous Improvement

### EBD

- Gather Baseline/ Current-State Data with Valid Methods (shadowing, surveying, focus groups, & clinical data)

- Use Baseline Data to Develop Future-State Value Streams, Prototypes & Program
- Apply EBD Concepts from Existing Literature

- Test & Predict Improvements of Future-State Models with Baseline Data

Hypothesize Outcomes  
Verify Application of Evidence & Metrics

- Collect Data with Same Pre-Design Methods
- Compare Post-Occupancy Data with Baseline Data
- Identify if Hypotheses are Supported

### Change Management

- Step 1: Create a Sense of Urgency**
- Share findings with staff to highlight potential improvement

- Step 2: Build a Coalition**
- Engage and empower staff to influence design

- Step 3: Form Operational and Design Goals**
- Created an evidence-based design matrix

- Step 4: Enlist & Empower Frontline Staff in Decisions**

- Step 5: Enable Staff Voice through Mock-up and Simulations**
- Staff assesses the room/plan's performance

- Step 6: Generate Consensus through Data**
- Data is shared with staff to show workflow predictions

- Step 7: Sustain Success by having Staff Set Future-State Workflows**
- Staff participates in day-in-the-life events to work through operational changes

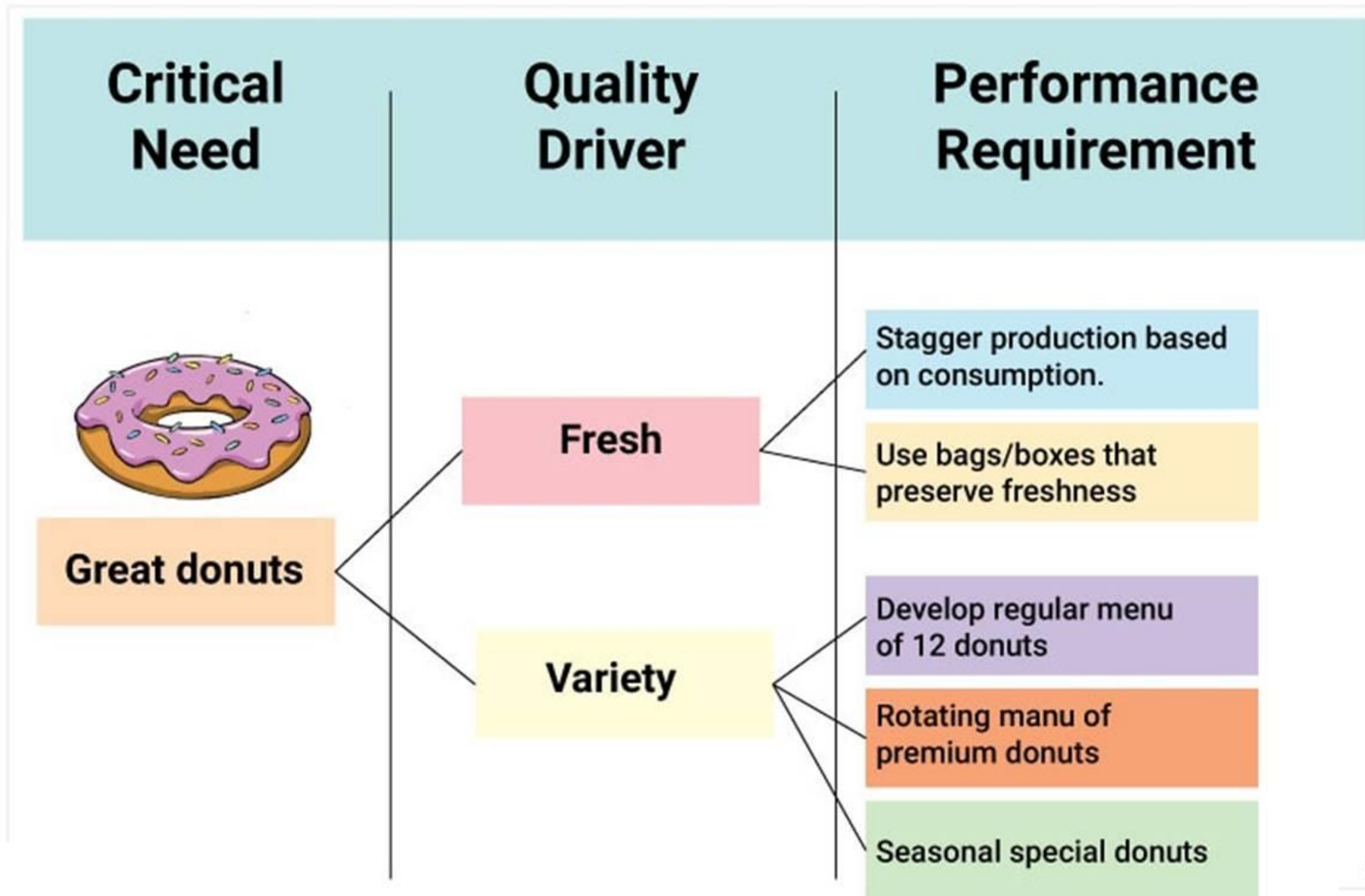
- Step 8: Institute time to lament, then change**
- Staff were able to provide continued feedback, which turned their frustration into flexibility and acceptance

# Critical Needs



# Quality Outcomes







# Froedert Hospital, Milwaukee, WI

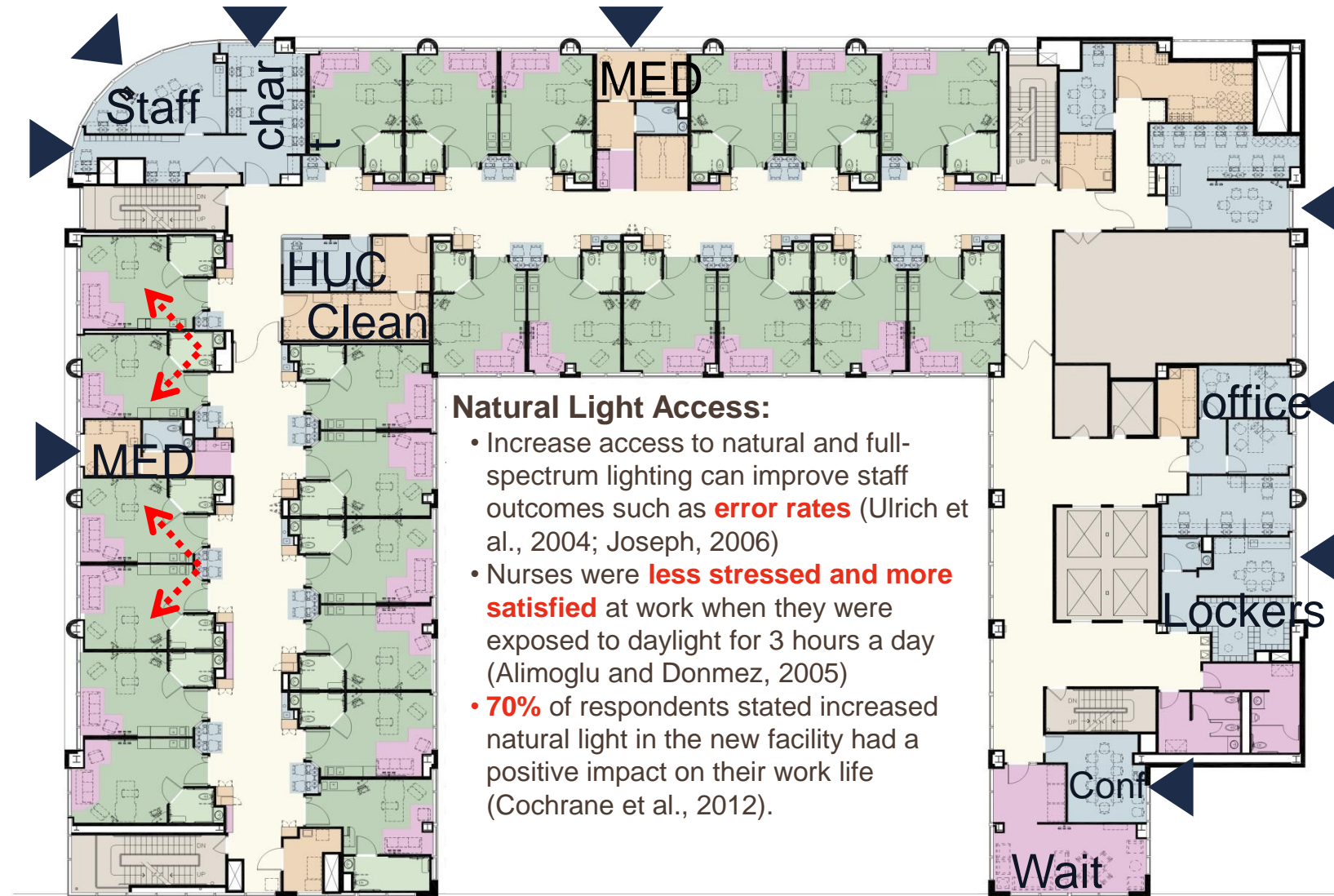




# Final Floor Plan: 24 Bed Unit

## Surveillance:

- Significantly reduced patient falls when direct visibility from commonly occupied workstations versus no visibility ( $p < 0.000$ ); (Calkins, 2012).



## Natural Light Access:

- Increase access to natural and full-spectrum lighting can improve staff outcomes such as **error rates** (Ulrich et al., 2004; Joseph, 2006)
- Nurses were **less stressed and more satisfied** at work when they were exposed to daylight for 3 hours a day (Alimoglu and Donmez, 2005)
- **70%** of respondents stated increased natural light in the new facility had a positive impact on their work life (Cochrane et al., 2012).

## Decentralization

HGA Research (Freihoefer, 2012):

- An 8-hour day shift nurse spends roughly 2.4 hours at charting stations (in this floor plan, that is a 6.66% usability among the 6 charting stations with 3 RNs).
- Nurses only spend roughly **45 minutes of their day hunting and gathering** for supplies and medications.
- Roughly **50%** of nurses' visits to decentralized charting stations involved face-to-face interaction.

# Final Floor Plan: 405 SQ FT

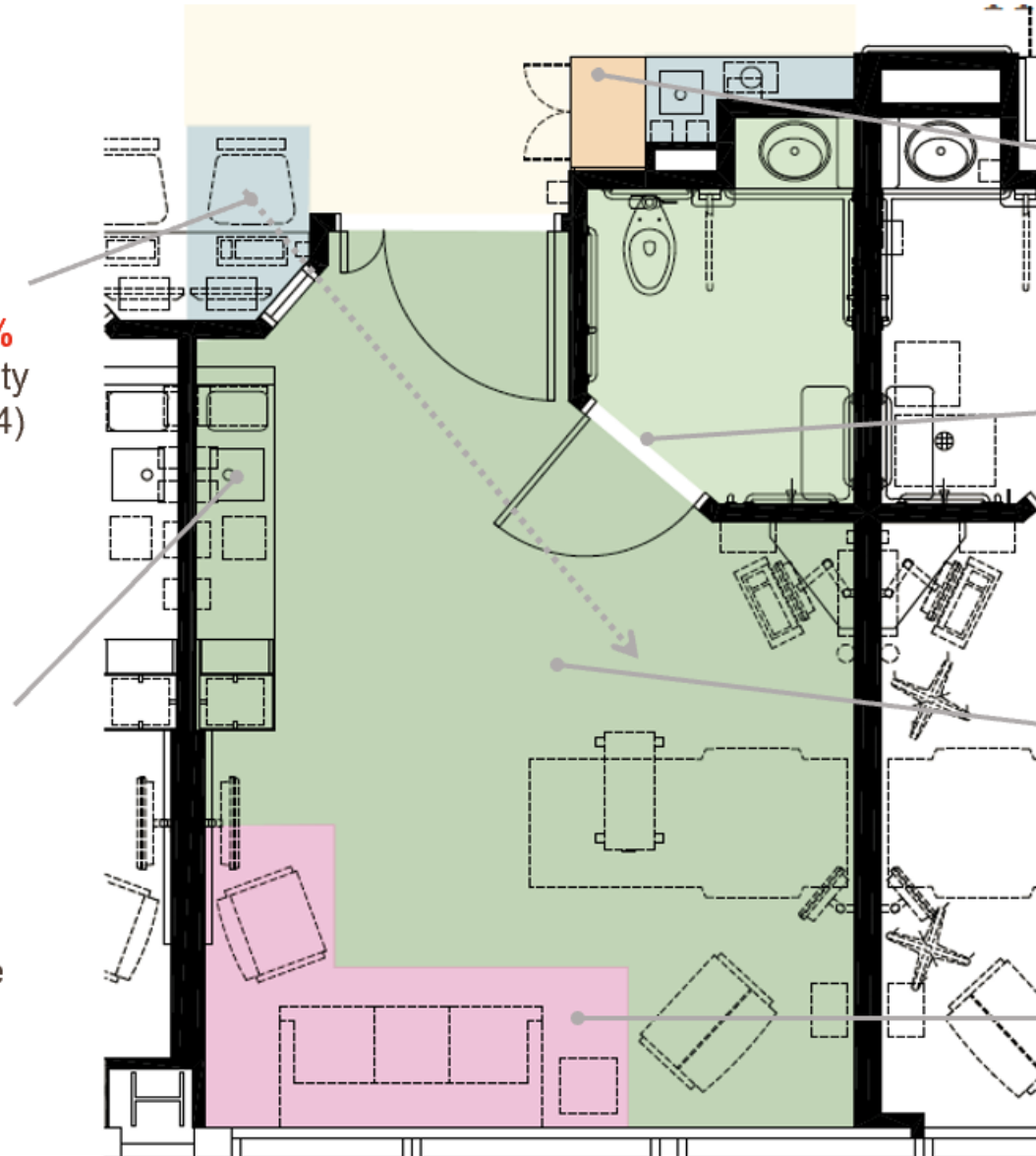
## Surveillance:

Rooms with low visibility had a **30% higher mortality rate** for high acuity patients (Lu, Ossman, & Leaf, 2014)

Rooms not visible from work areas had **31% higher fall rate** (Choi, 2012)

## Hand Hygiene:

Placing the sink upon entry encourages immediate hand washing, also positioning it with a line-of-sight to the patient so caregivers can greet patients and patients can observe good hygiene practices (Freihoefer, 2013).



## Deployed Supplies:

Deploying supplies has shown to significantly **reduce staff travel by 1 to 1.5 miles a day** and significantly increased time spent in patient room by 6 to 10% (Freihoefer, 2013).

## Fall Reduction:

Doors that can remain open and have direct access from the bed, shows nearly **50% reduction in fall** (Calkins, 2012).

## Acuity-adaptable Rooms:

Acuity-adaptable rooms and universal room with ample space can reduce the risk of patient and staff injuries and patient dissatisfaction with a **90% reduction in patient transfers**. (Hendrich, Fay, & Sorrells, 2004).

## Family Space:

Patient rooms with a designated family space had **nearly half the patient falls** than compared to those without (Calkins, Biddle, & Biesan, 2012).









## Nurses' Time Spent

	Existing Unit Current State	Benchmark Decentralized Studies	Decentralized Prototype Prediction	Post- Occupancy Results
Patient Rooms	39%	45-54%	+5-15%	<b>45%***</b>
Charting Stations	43%	32-39%	-4-8%	39%
Medication & Supply Rooms	5%	1-5%	-0-3%	6%
Support Rooms	1%	2-5%	-0-2%	3%
Traveling	13%	5-8%	-4-8%	<b>7%***</b>

- 36 minutes more time spent in patient room per nurse
- 6-7 dayshift nurses = Roughly 3.5 to 4 hours more time spent in patient rooms

# Travel Distances

	Post-Occupancy @ 3-months	Post-Occupancy @ 8-months	Post-Occupancy @ 12-months	Overall Average
Distance Traveled	2.89 miles	2.04 miles	1.64 miles	2.08 miles

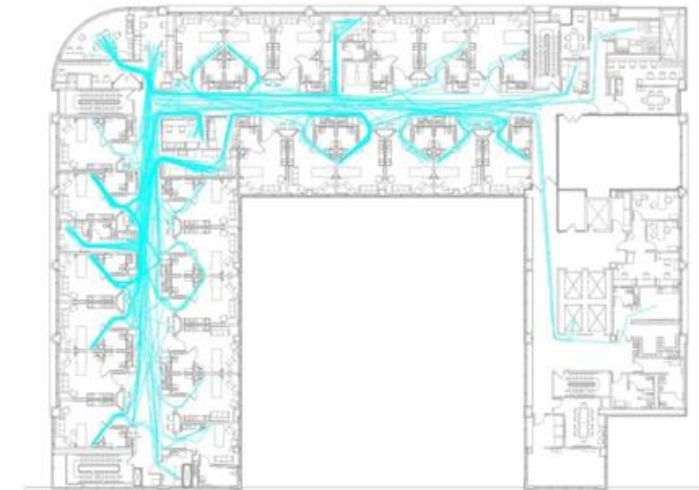
3-Months



8-Months



12-Months



Significant reduction over time ( $p < 0.001^{***}$ )

Approximately 1.25 miles more efficient overtime



# Efficiency Calculation



6% of 1 FTE = 0.06

0.06 FTE X 32.9 FTEs = 1.97 FTEs

1.97 FTE x 80 hrs x 26 payperiods = 4,106 hours

4,106 hours X (\$34.65/hr\*28% benefits package) =

**Annual productivity cost savings of \$182,097.55 per year**

# POE Results: Staff Satisfaction

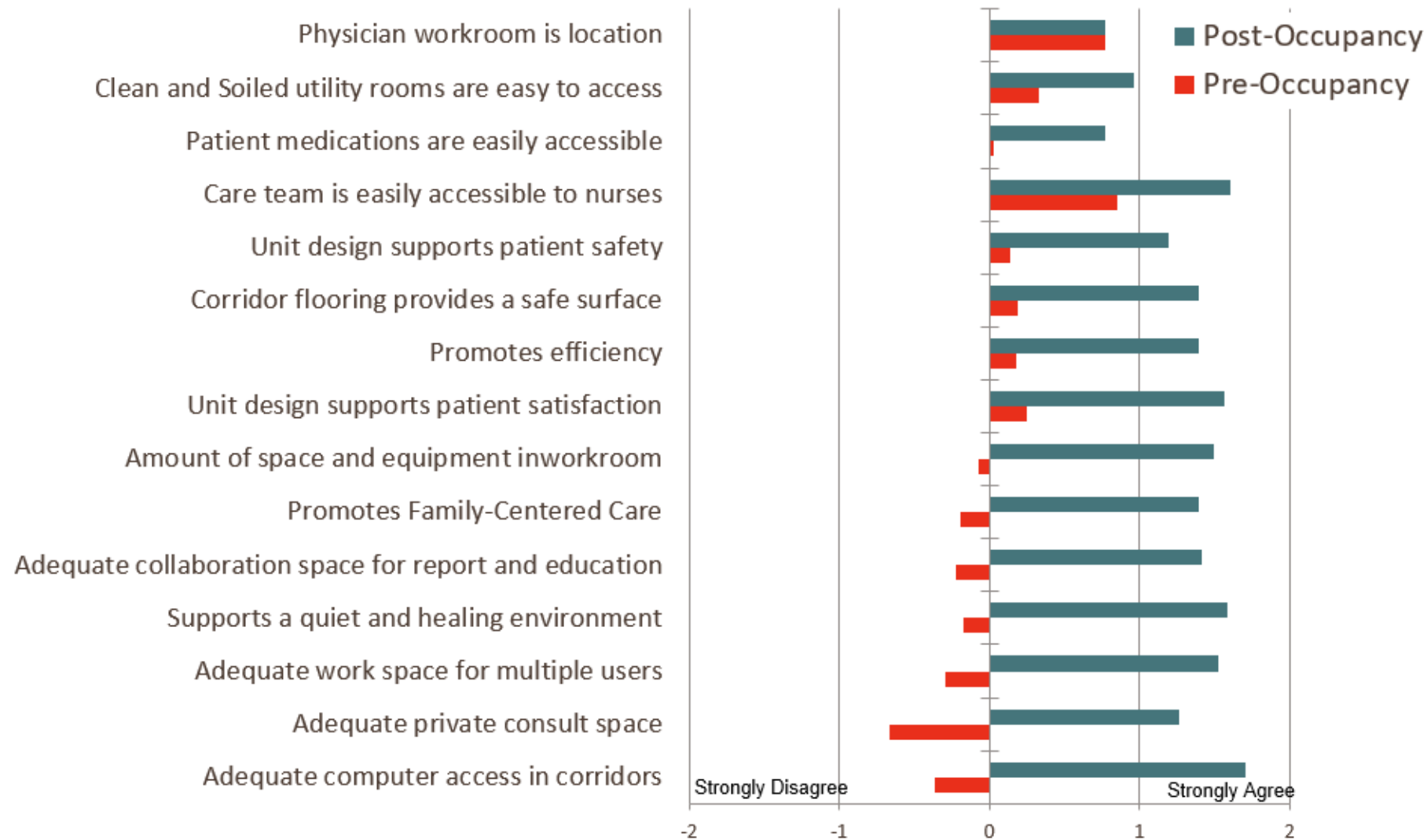


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Staff Satisfaction Survey (Unit Level)



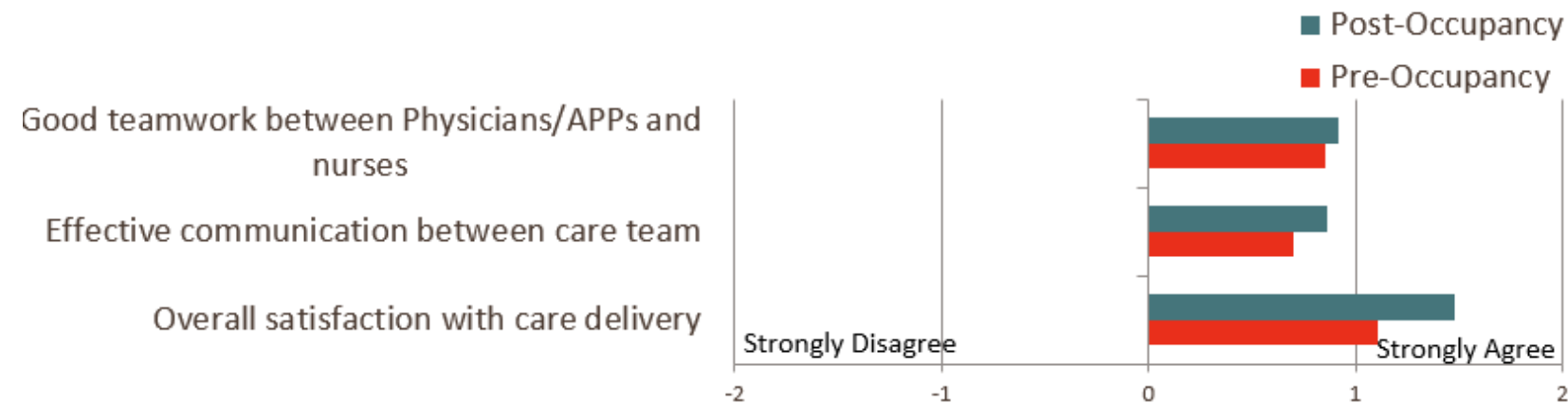
**Overall Unit Design a 31%\*\*\* increase in staff satisfaction**

# POE Results: Staff Satisfaction



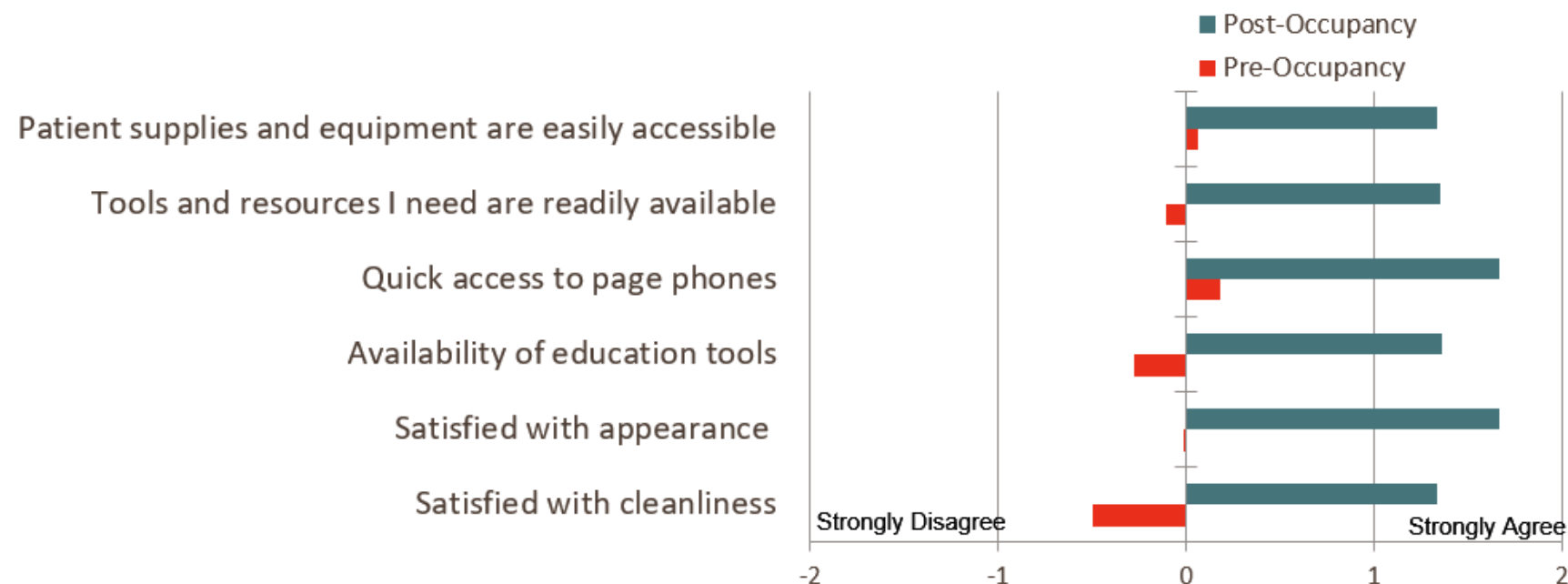
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**Job Performance a 5%\* increase in staff satisfaction**

Staff Satisfaction Survey (Patient Room Level)



**Overall Patient Room a 40%\*\*\* increase in staff satisfaction**



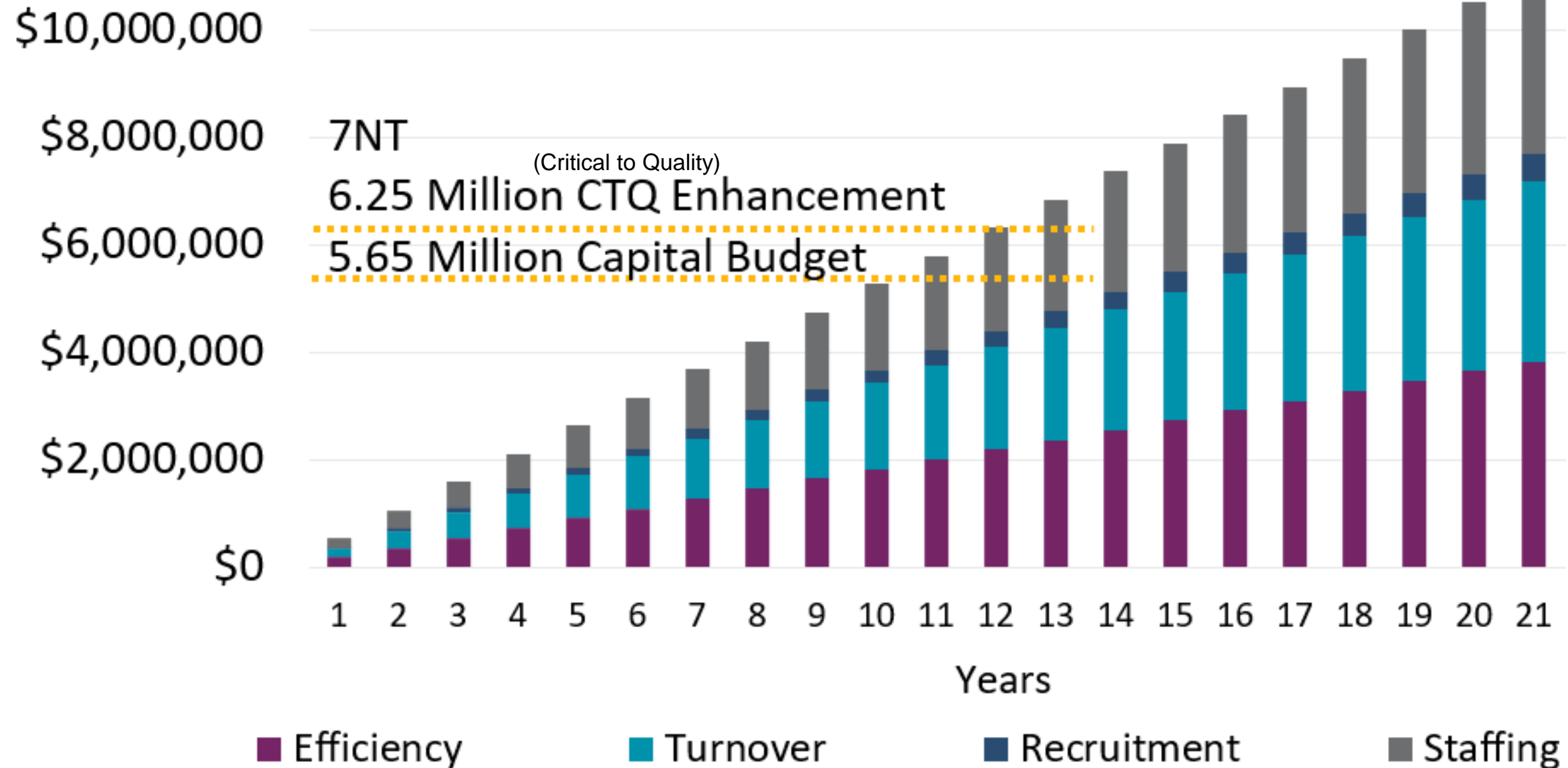
# Total Annual Cost Savings



Efficiency	182,097.55
Turnover	160,025.50
Recruitment	23,949.24
Staffing	160,200.26

**\$526,272.55 in annual cost savings**

# ROI



# PATIENT METRICS

In 2017, there were 5.2 FEWER  
STAGE 2 AND ABOVE PRESSURE  
ULCER INCIDENCES with a ROI of

**\$224,536 yearly**

Significantly less ALOS, approximately 30 less patient  
days yearly with a ROI of \$93,765 yearly

**35% reduction**

in falls (per 1,000pt/days); 5.75 fewer  
falls with injuries yearly with a ROI  
of \$53,667 yearly

Significant increase in  
key HCAHPS items:

**15%** in Quietness  
( $p < 0.000^{***}$ )

**7%** in Cleanliness  
( $p < 0.000^{***}$ )

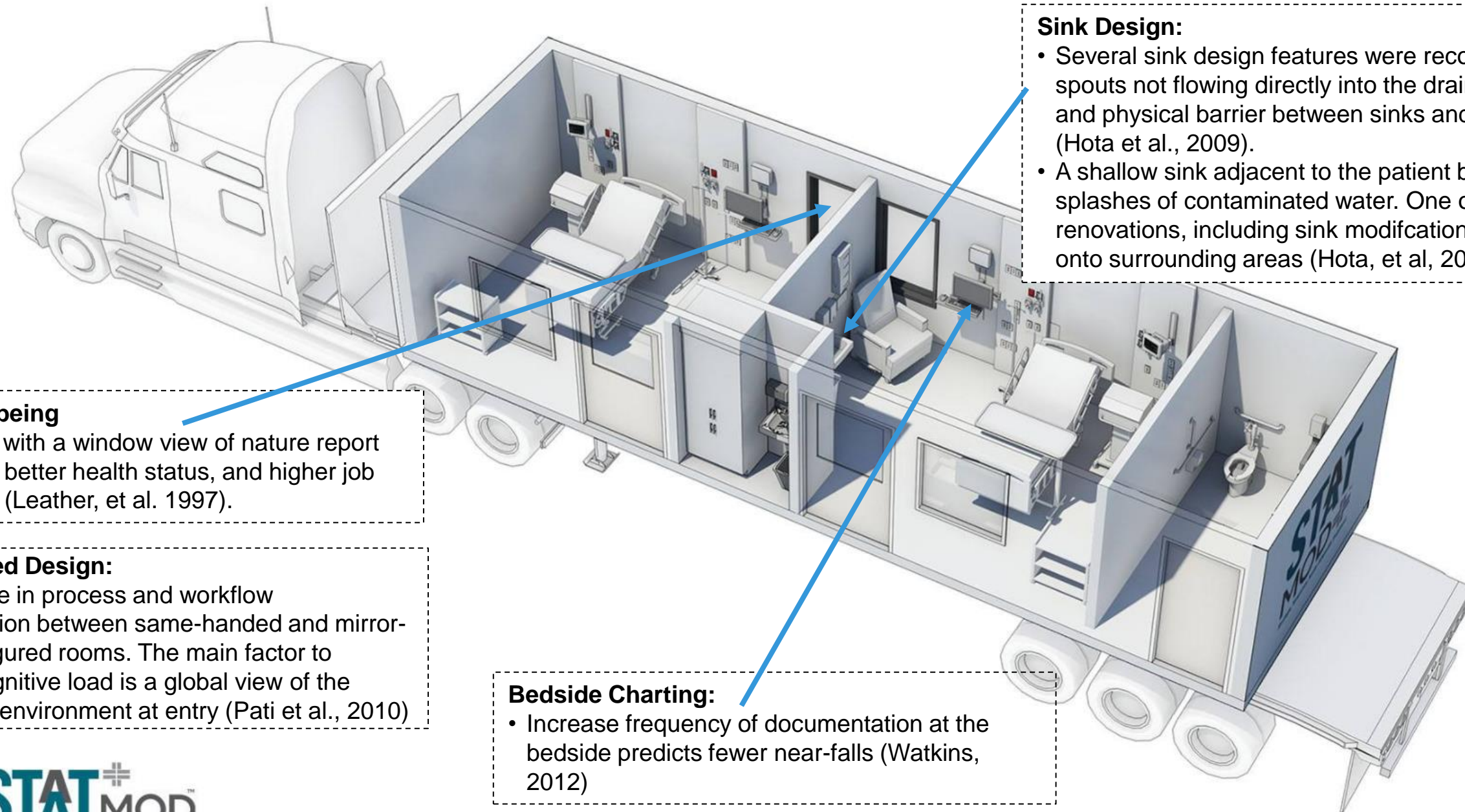
**7%** in Overall Care  
( $p < 0.000^{***}$ )

**4.5%** in Likelihood to Recommend  
( $p = 0.003^{**}$ )

**3.5%** in Communication with  
Nurses ( $p = 0.024^*$ )



# STAAT MOD



## Staff Well-being

Employees with a window view of nature report less stress, better health status, and higher job satisfaction (Leather, et al. 1997).

## Standardized Design:

No difference in process and workflow standardization between same-handed and mirror-image configured rooms. The main factor to reducing cognitive load is a global view of the patient care environment at entry (Pati et al., 2010)

## Sink Design:

- Several sink design features were recommended by research: faucet spouts not flowing directly into the drain, decreased water pressure, and physical barrier between sinks and adjacent preparatory spaces (Hota et al., 2009).
- A shallow sink adjacent to the patient bed resulted in exposure from splashes of contaminated water. One outbreak was eliminated by renovations, including sink modifications that prevented splashing onto surrounding areas (Hota, et al, 2009).

## Bedside Charting:

- Increase frequency of documentation at the bedside predicts fewer near-falls (Watkins, 2012)

# STAAT MOD



**STAT<sup>+</sup>MOD<sup>™</sup>**  
Strategic, Temporary, Acuity-Adaptable Treatment

# Have you ever experienced a roadblock with Lean +/-or EBD?

- No – it's always been great
- Never worked with both at the same time
- Yes with Lean
- Yes with EBD
- Yes with Both



# Lean + EBD Toolkit



AIA

P2SL



Practice Based Research (PBR)	Evidence Based Design (EBD) Steps/Toolkit	Lean Integration Toolkit
<b>Pre-Design Activities</b>	<b>EBD Step 1: Define EBD Goals and Objectives</b>	<b>Plan</b>
Define CTQs (Customers and Requirements)	Challenges and Trends	Project Alignment - Conditions of Satisfaction Community Engagement
Define Outcome Metrics	Use Facility Design to Help Improve Outcomes	
Collect/Identify Baseline Data		Gemba* - Waste Walk
Current State Investigation		Mapping - Value, Process, Experience, Journey
Determine Root Causes		5 Whys Fishbone Diagram
Develop Problem Statements and Goals - for Design and Operations		A3s*
Develop Project Plan and Milestones		Last Planner System™ * (LPS)
	<b>EBD Step 2: Find Sources for Relevant Evidence</b>	
Design Insights/Trends Discussion	Focus on Addressing a Design Challenge	
Research Collection	Develop the Question before you Search for Relevant Evidence	
Future State Development		3P Event
Visioning/Imaging - Project Vision		
	<b>EBD Step 3: Critically Interpret Relevant Evidence</b>	
<b>Design Activities</b>		
Secondary Research Collection/Review		
	<b>EBD Step 4: Create and Innovate EBD Concepts</b>	<b>Do</b>
Develop Potential Solutions		Target Value Delivery* Set Based Design
Mock-Up Development/Testing	Evaluate the Strategies	Paper Dolls
Material Research		Evaluation - Sound Decision Making* Choosing by Advantages (CBA)
Discuss Prefabrication Opportunities		Big Room Trades engaged early

	<b>EBD Step 5: Develop a Hypothesis</b>	
	Indicate or Predict the Relationship between the Design Strategy and the Outcome	PDCA - A3 with follow-up
	<b>EBD Step 6: Collect Baseline Performance Measures</b>	<b>Check</b>
Evaluate-Correct-Re-evaluate Potential Solutions	Reference Existing Metrics	Plus/Delta* - Retrospectives*
Scenario Testing		Rapid Prototyping - VR*
Preparing Staff for Process Changes		
Change Management		Stakeholder Engagement
	<b>EBD Step 7: Monitor Implementation of Design and Construction</b>	<b>Act/Adjust</b>
<b>Construction Activities</b>		
Transition Planning		Standardized Work - LPS
Activation Planning		5S - LPS
Education		
Modular Construction		
	<b>EBD Step 8: Measure Post Occupancy Performance Results</b>	
<b>Occupancy</b>		
(Phased) Post Occupancy Evaluation	Compare outcome metrics to pre-design phase	
Continuous Improvement	Provide feedback to Design+Construction Teams	Retrospectives
Sustain the Changes	Clarify Programming Issues and Fine Tune Facility	5S

\*This thinking or tool will be used through the life of the Project

<https://tinyurl.com/LEANEBDforum2020>



## Basic Services

- Organizational Goals
- Clinical Outcomes
- Scholarly Evidence
- Project Success Measures



## Additional Services

- Customized to the Project
- In Depth Evaluation and Recommendation



## Focused Research

- Select topic you want to study

# Start small, but start.



# Contact Us



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# LEAN IN DESIGN FORUM

MAY 27-28, 2020

**In the spirit of continuous improvement, we would like to remind you to complete this session's survey! We look forward to receiving your feedback.**

