

Flooring is the Foundation for Healthcare

How evidence-based design (EBD) supports clinical and operational efficiencies in resilient and soft flooring surface building material solutions

Today's Presenter

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“STAY AT HOME” IMPULSE DECISION



Flooring is the Foundation for Healthcare

How evidence-based design (EBD) supports clinical and operational efficiencies in resilient and soft flooring surface building material solutions

Learning Objectives

1. Explain how flooring can help **mitigate slips, trips, and falls** (STFs), and have an actionable impact to **lessen patient and staff injuries associated with falls**.
2. Discuss how flooring can **reduce ambient noise levels** and **reduce staff fatigue** in the healing environment.
3. Describe how flooring choices can **reduce surface contamination** and potential risk of healthcare-associated infections (HAIs) and **improve indoor air quality** (IAQ).
4. Identify how healthcare flooring can **improve patient and family satisfaction** as well as represent the best **return on investment** (ROI).

FLOORING PRE-EVALUATION



Flooring Pre-Evaluation

An integrated system

Flooring refers to the **subfloor**, **floorcovering** and **surface finish** combined to create a functional, durable surface for:

- Patient care
- Caregiver comfort
- Operational and clinical efficiency



Clients want a manufacturer partner who can provide:

- A complete flooring system
- Warranty
- Adhesives
- Maintenance
- Technical support
- Solutions for all Applications

Flooring Pre-Evaluation



Important concepts for healthcare settings:

- Flooring performance characteristics are evaluated during programming and schematic design phases based on project drivers.
- Validate first cost vs. total cost of ownership (TCO) from a maintenance perspective and the floor's ability to have an actionable impact on the health system's reimbursement drivers.

Flooring Pre-Evaluation

Importance of Evidence Based Design:

EBD acknowledges a **link between the physical environment, outcomes, and efficiency.**

Selection and specification should **support human-centered and evidence-based design.**

Rather than offering a prescription for floorcovering selection, an **evidence-based process will inform good design decisions.**

Informed Evidence Based Design Interior Finishes Support:



Patient Outcomes



Acoustics



Underfoot Comfort



Infection Control

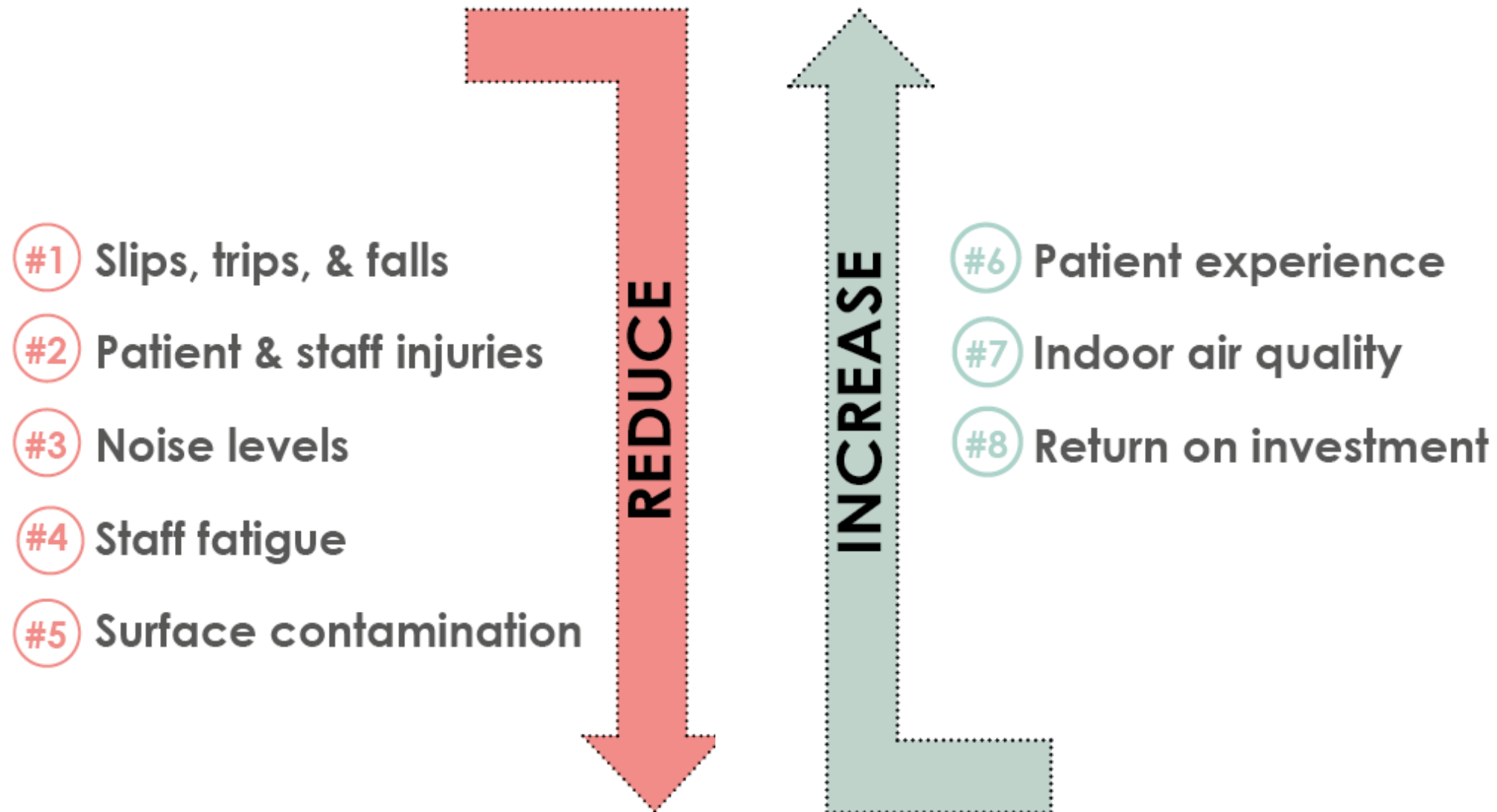


ROI



Health & Wellness

Flooring Pre-Evaluation – 8 EBD Flooring Performance Characteristics



EBD PERFORMANCE CHARACTERISTIC: Improve IAQ

- Flooring maintenance protocol and material content impact IAQ.
- Flooring composition should meet stringent sustainable standards.

Rubber: **GREENGUARD Gold Standard**

LVT: **GREENGUARD Gold Standard**

Carpet Tiles: **Green Label Plus**



Health Product Declaration (HPD)

Environmental Product Declaration (EPD)



For healthcare spaces that
are better for the planet.

**Choose Carbon
Neutral Floors.™**



EBD PERFORMANCE CHARACTERISTIC: Improve IAQ

Carbon Neutral Interior Finishes

- The CDC has documented that the carbon footprint of building materials can impact climate change and health.

How We Can Help:

- Flooring manufacturers, whose products are third-party verified carbon neutral, reduce and offset carbon emissions
- Check the manufacturer's website for an explanation and documentation of its efforts to reduce or eliminate its carbon footprint
- Verify material content, maintenance protocol, and environmental considerations

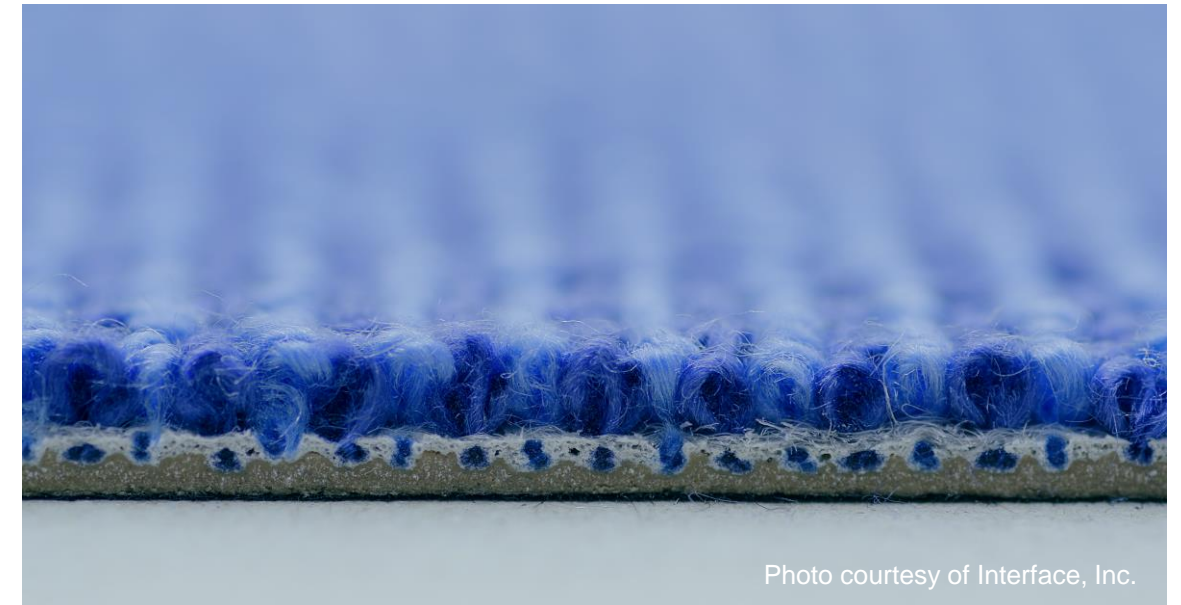


Photo courtesy of Interface, Inc.

Best solution | A carbon storing carpet tile that ultimately results in less carbon dioxide in the atmosphere than if it had not been created at all

PATIENT AND FAMILY EXPERIENCE SATISFACTION AND OUTCOMES

MATERNITY WARD

Patient and Family Experience Satisfaction and Outcomes

Patient perception of the hospital experience is measured by **Hospital Consumer Assessment of Healthcare Providers and Systems** (HCAHPS) scores.

- A patient satisfaction survey required by the **Centers for Medicare and Medicaid Services** (CMS) for all acute care hospitals in the United States.
- Revenue is impacted by patient satisfaction, as the results have financial implications for the health system.



Photo courtesy of nora systems, Inc

Patient and Family Experience Satisfaction and Outcomes

CMS funding is tied to:

- Patient experience
- Outcomes
- Safety
- Falls
- Infection
- Noise

6%
Pay-for-Performance
Rewards quality,
not volume



2%
Value-Based Purchasing
Patient experiences &
outcomes, HCAHPS



1%
**Hospital –Acquired
Conditions**
Cleanliness & Falls



Up to **3%**
**Readmissions
Reductions Program**
Noise levels

The Hospital Value-Base Purchasing program is a Center for Medicare & Medicaid (CMS) Initiative that adjusts what Medicare pays hospitals based on quality of inpatient care the hospitals provide to the patient (www.cms.gov)

CMS estimates that by 2024 the hospital payer mix will be 40% Medicare and 18% Medicaid.

- This means that **58% of a health system's revenue will come from CMS** with 6% at risk.

<https://aharesourcecenter.wordpress.com/tag/hospital-payer-mix/>

EBD PERFORMANCE CHARACTERISTIC: Improve Patient & Family Satisfaction

Pattern with Purpose

Flooring supports wayfinding, defines paths of travel, and denotes areas within patient rooms.

Delineating:

- Patient
- Caregiver
- Family zones

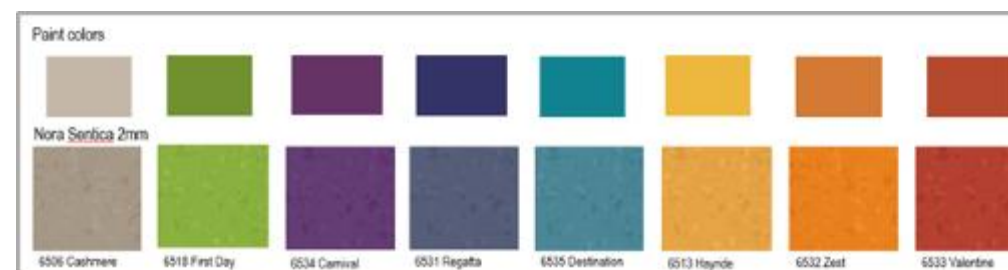
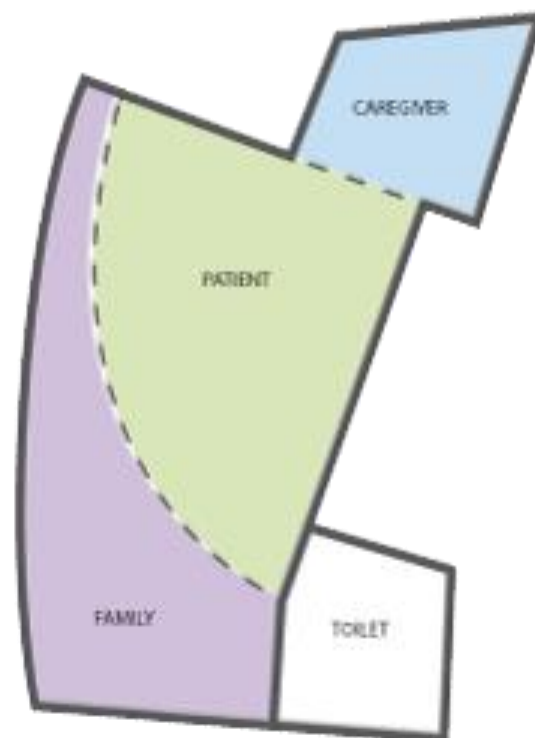


Image courtesy of FKP | CannonDesign

EBD PERFORMANCE CHARACTERISTIC: Improve Patient & Family Satisfaction

Interior finishes support cleaning and maintenance

- Absence of blocked-off corridors
- Elimination of toxic maintenance protocol
- Reduces noise
- Improved clinical efficiency

Risk Mitigation

- Resilient floor cleaned without chemicals can mitigate respiratory distress issues in patients and caregivers, supporting health and wellness.
- Specifying resilient flooring that eliminates the need for coating, stripping, and refinishing best supports HCAHPS scores and total cost of ownership.



Photo courtesy of nora systems, Inc

PATIENT AND STAFF HEALTH, SAFETY AND COMFORT

EBD PERFORMANCE CHARACTERISTIC: Reduce Patient & Staff Injuries Associated with Falls

Floorcovering composition can:

- Reduce **economic impact** of injuries
- Reduce **ground impact force** from falls
- Provide **firmness and stability** to prevent trips and loss of balance
- Increase **slip resistance** (COF)
- Reduce **rolling resistance** to minimize manual wheelchair pushing effort
- **Mitigate infection control** issues
- Reduce **musculoskeletal** injury
- Attenuate **ambient sound**



Photo courtesy of nora systems, Inc.

EBD PERFORMANCE CHARACTERISTIC:

Reduce Slips, Trips, and Falls (STFs)





Falls are a common and devastating complication of patient care, particularly with elderly patients.

- Three to five falls per 1,000 bed-days.
- An estimated 700,000 to 1 million hospitalized patients fall each year, according to the Agency for Healthcare Research and Quality (AHRQ).
- A fall is considered a “never event”. It should never happen and is non-reimbursable to the health system.

EBD PERFORMANCE CHARACTERISTIC:

Reduce Slips, Trips, and Falls (STFs)

Flooring Compliance to Prevent Fall-Related Injuries:

-  **Choose resilient flooring** with an extremely dense, never-coated surface delivers the best coefficient of friction (COF) to reduce STFs.
-  **Emphasize mitigating** STFs by facilitating transport of rolling loads over a level surface without transition strips.
-  **Reduce impact** forces applied to the body with compliant flooring as passive intervention. Dense fiber construction of carpet tiles and rubber can mitigate instances and severity of slips and falls.
-  **Follow guidelines** on flooring patterns with a medium-sized pattern (1 inch to 6 inches wide) was associated with *more* falls than floors with no pattern, small pattern (less than 1 inch wide), or large pattern (wider than 6 inches).

(FGI Guidelines for Design and Construction of Hospitals, 2018 Edition).

EBD PERFORMANCE CHARACTERISTIC: Reduce Surface Contamination & Potential Risk of HAIs

Floors are a potential source of transmission

Non-slip socks worn by hospitalized patients are frequently contaminated with MRSA (Methicillin-resistant *Staphylococcus aureus*) and VRE (Vancomycin-resistant enterococci).

- Specification of a resilient floor that is **not** a medium for microorganisms is a proactive approach.
- Rubber's extremely dense, closed surface, is inherently dirt repellent.



EBD PERFORMANCE CHARACTERISTIC:

Reduce Surface Contamination & Potential Risk of HAIs

FGI Guidelines, Section A2.1-7.2.3.1: these room types ***“shall have floor and wall base assemblies that are monolithic and have an integral coved wall base that is carried up the wall a minimum of 6 inches and tightly sealed to the wall.”***

1. Operating rooms
2. Class 2 and Class 3 imaging rooms
3. Cesarean delivery room
4. Procedure rooms: cystoscopy, urology, and endoscopy
5. Endoscope processing rooms
6. IV and chemotherapy preparation rooms
7. Airborne infection isolation (AII) rooms
8. Protective environment (PE) rooms
9. Sterile processing facilities



Photo courtesy of nora systems, Inc.



Photo courtesy of nora systems, Inc.

EBD PERFORMANCE CHARACTERISTIC:

Reduce Noise Levels

Noise is an adverse event; it is neither benign nor neutral.

Flooring can either contribute to noise **or** reduce unwanted ambient noise in the built environment.

Increased noise levels:

- have a measurable impact on patient and staff experience
- contribute to increased length of stay and medication use
- affect wound healing due to increased sleep disturbances
- can lead to emotional exhaustion, increased fatigue and caregiver burnout

“Quietness of the Hospital Environment” is consistently one of the lowest-rated items on the HCAHPS survey across the U.S.

HCAHPS survey question #8 asks:

During this hospital stay, how often was your room and bathroom kept clean?

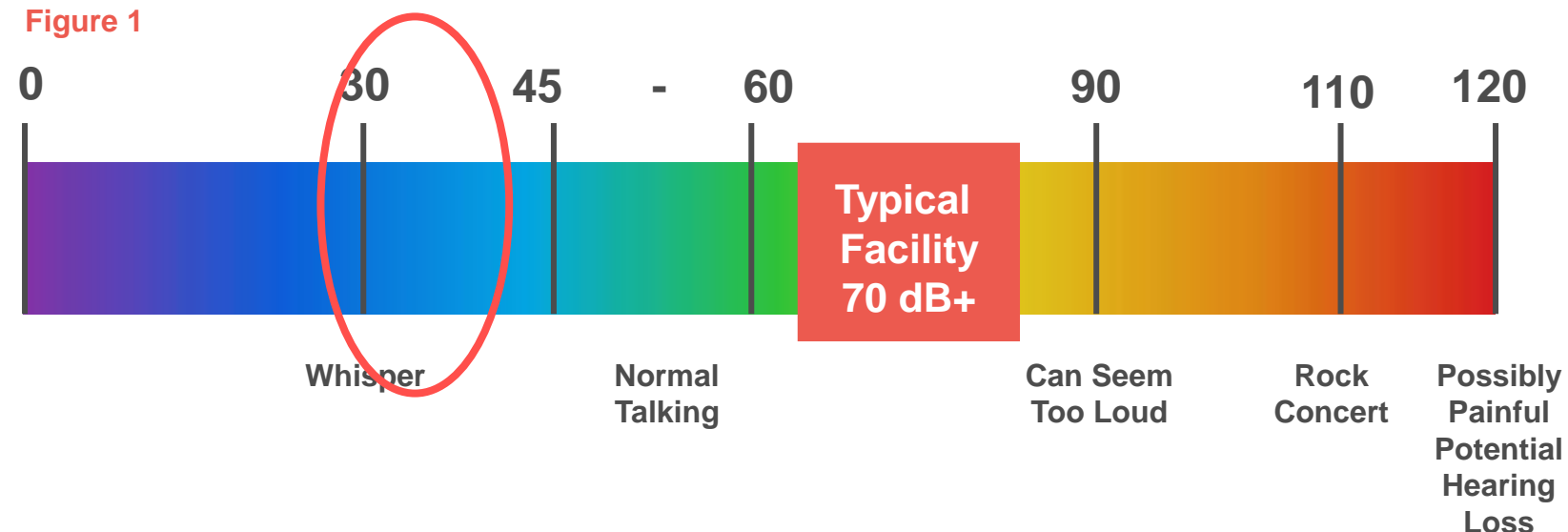
HCAHPS survey Question #9 asks:

During this hospital stay, how often was the area around your room quiet at night?

EBD PERFORMANCE CHARACTERISTIC: Reduce Noise Levels

- Select a flooring system that helps abate “traffic” and in-room impact noises
- Directly affects patient healing and length of stay, positively impacting hospital HCAHPS scores

Figure 1



The World Health Organization (WHO) guideline values for continuous background noise in hospital patient rooms are 35 dBA during the day and 30 dBA at night, with nighttime peaks to not exceed 40 dBA.



Use a multi-faceted approach
to sound control

EBD PERFORMANCE CHARACTERISTIC:

Reduce Staff Fatigue



EBD PERFORMANCE CHARACTERISTIC: Reduce Staff Fatigue

According to the CDC, medical errors rank as the third top cause of death.

- 1) Heart disease
- 2) Cancer
- 3) Medical errors**
- 4) Respiratory disease

Reduce ambient sound levels to mitigate caregiver cognitive fatigue.

“Floors should be selected with consideration to acoustic properties to help preserve sleep and protect privacy and accuracy of communication in support of HIPAA compliance and medical error reduction.”

FGI Guidelines for Design and Construction of Hospitals, 2018 Edition
Section 1.2-6.1.3: Design Criteria for Acoustic Surfaces and
Section 1.2-6.1.6: Design Guidelines for Speech Privacy.

EBD PERFORMANCE CHARACTERISTIC:

Reduce Staff Fatigue

Overall, **\$21 billion** in cost is due to medical errors in the U.S.



Roughly **\$14 billion** in cost is caused by human factors.

Source: Shanafelt, Boone, Tan et al, 2012, 2015; SOA/Milliman/HFMA, 2016; CDC, 2015

The nursing profession is the largest segment of the nation's healthcare workforce, totaling **3.6 million** workers.

- Nearly half of our nurses exhibit substantial symptoms of work-related burnout.
- RN turnover with less than 2 years of experience is at 51%.
- With \$49,000 and 86 days per RN turnover, a hospital loses \$6.4 million annually.

CASE STUDY: PARKLAND HOSPITAL

Case Study | Parkland Hospital, Dallas, TX

Facility Design and EBD as Guiding Principles

The design team identified **five** proven strategies to create an environment of care (EOC) incorporating streamlined processes, new technologies, and nurturing evidence-based design elements:

1. Improving patient **safety**
2. Improving patient **outcomes**
3. Increasing patient, family, and staff **satisfaction**
4. Improving **efficiency and effectiveness** of staff
5. Today's **best practices**, flexibility to adapt



Case Study | Parkland Hospital, Dallas, TX

After EBD evaluation, mock-ups and extensive testing premium rubber flooring was selected:

- 1 million+ square feet installed in ORs, corridors, labs, pharmacies, staff areas, radiology, and nurseries.

Key Decision Points:

- Sustainable facility, flooring won't be replaced for decades
- No-wax maintenance routine saves time, reduces disruption
- Enhanced stain resistance withstands common chemicals
- Acoustic benefits have positive impact on patient healing and staff communication



Photo courtesy of nora systems, Inc

Case Study | Parkland Hospital, Dallas, TX



FLOORING POST-EVALUATION

Flooring Post-Evaluation | EBD Supports Healthcare Operational Efficiency

A Flooring Post-occupancy Evaluation (POE)

In 2016, Nemours/Alfred I. duPont Hospital for Children in Wilmington, DE, constructed a 450,000-square-foot, \$270-million expansion.

- 20 flooring manufacturers were evaluated for performance criteria and a mock-up was constructed:
 - **Safety**
 - **Acoustics**
 - **Maintenance**
 - **Ergonomics**
 - **Sustainability**
 - **Durability**
 - **Warranty**
 - **Life cycle cost**
 - **Price**
- One year later the architect conducted a flooring POE.



Photo courtesy of nora systems, Inc

Flooring Post-Evaluation | EBD Supports Healthcare Operational Efficiency

POE Results

- Continuous flooring solution eliminated thresholds
- EVS saw a reduction in injury, back injuries mitigated
- No wax floor requires less physical exertion
- ‘Perception of quiet’ was greatly improved
- Positive impact on HCAHPS scores
- Footfall sound greatly reduced
- Perception of fatigue was less, though walking distance increased
- Improved staff morale



Flooring Post-Evaluation | EBD Supports Healthcare Operational Efficiency

POE Results (continued)

- Caregiver functionality improved with floor pattern
- No erosion or discoloration under hand-sanitizers
- HCAHPS Question No. 8 (perception of cleanliness) rose from 60th percentile with VCT to 90th percentile with rubber
- 11% annual decrease in floor-care supplies
- 75% labor efficiency recognized with non-coated product
- Patient room turnover time for floor cleaning went from 4 hours to 45 minutes



Photo courtesy of nora systems, Inc

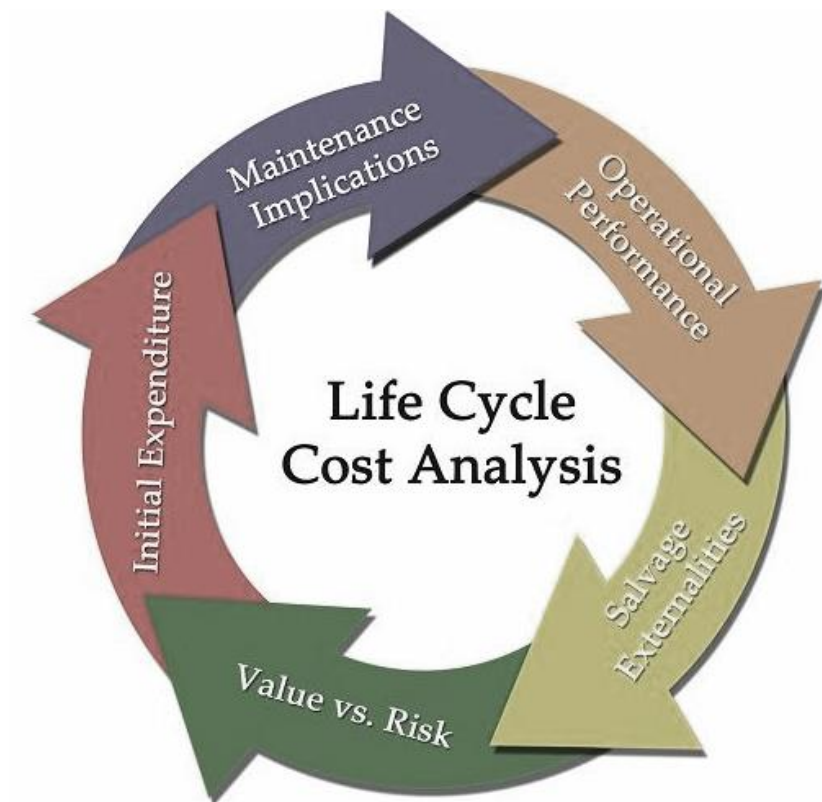
CONCLUSION (ROI & TAKEAWAYS)

EBD PERFORMANCE CHARACTERISTIC #8

Represent the Best Return on Investment (ROI)

Flooring is a critical capital investment decision for healthcare facilities as it relates to outcomes.

- Evaluate a flooring material's long-term cost-effectiveness in relation to its initial costs.
- Define differences between flooring materials and their ability to sustain complex demands in specific settings.
- Examine real-time cleaning & maintenance (C&M), first cost, and total cost of ownership (TCO).
- One flooring manufacturer has a third-party credible Life Cycle Cost Analysis (LCCA) tool for specifiers and end users to compare the economic impact of alternative materials over the reference service life (RSL) of a product.



EBD PERFORMANCE CHARACTERISTIC #8

Represent the Best Return on Investment (ROI)

Premium rubber flooring supports TCO and has an extremely low life cycle cost compared to other resilient flooring options.

Manufacturer partners should provide a “complete flooring system” addressing all major construction challenges, e.g.

- constrained capital budgets
- speed in installation time
- high concrete moisture solution
- system complexity
- one point of warranty
- ability to turn a space quickly
- shorter construction timeframe

Speed to Market = \$\$\$



Photo courtesy of nora systems, Inc

Flooring Post-Evaluation | EBD Supports Healthcare Operational Efficiency

Key Takeaways

- Built environment affects outcomes
 - Make informed flooring decisions
- Selection goes beyond first cost
 - Many variables, including life cycle cost and TCO
- Flooring has actionable impact on operational and clinical efficiency
 - Equating to money and time saved
- Flooring informed by EBD improves
 - Patient outcomes, safety, satisfaction, and HCAHPS scores, clinical and operational efficiency



Photo courtesy of nora systems, Inc

THANK YOU!

Please contact Donna Cannon for follow up questions: donna.cannon@nora.com

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