A Brief Guide: Using the Safety Risk Assessment Tool in Healthcare Facility Design & Construction

This toolkit has been created with support from the Agency for Healthcare Research and Quality (AHRQ) Grant R13HS021824 and the Facility Guidelines Institute (FGI). The content is solely the responsibility of the authors and does not necessarily represent the official views of the Agency for Healthcare Research and Quality.
# SAFETY RISK ASSESSMENT (SRA) GUIDE
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# ENVIRONMENT AS ROOT CAUSE FOR SAFETY

<table>
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<tr>
<th>Sentinel Events (outcome: death/permanent loss of function)</th>
<th>TJC (‘04-2Q ‘13) RCA: Sorted by Top Environment Root Cause</th>
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</thead>
<tbody>
<tr>
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<td>Env. RCA events (may be multiple)</td>
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<tr>
<td>1. Suicide (Psych Injury)</td>
<td>329</td>
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<td>2. Falls</td>
<td>229</td>
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<td>3. Foreign object</td>
<td>192</td>
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<td>4. Delay trtmnt</td>
<td>140</td>
</tr>
<tr>
<td>5. Med equip</td>
<td>132</td>
</tr>
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<td>6. Criminal events (Security)</td>
<td>110</td>
</tr>
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<td>7. Wrong pt/site/proc</td>
<td>96</td>
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<td>8. Post-op complication</td>
<td>87</td>
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<td>9. Medication errors</td>
<td>70</td>
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<td>10. Elopement (Security)</td>
<td>58</td>
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<td>11. Restraint</td>
<td>47</td>
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<tr>
<td>12. Fire</td>
<td>43</td>
</tr>
<tr>
<td>13. Perinatal</td>
<td>47</td>
</tr>
<tr>
<td>14. Infection</td>
<td>29</td>
</tr>
<tr>
<td>15. Ventilator</td>
<td>26</td>
</tr>
<tr>
<td>16. Abduction (Security)</td>
<td>21</td>
</tr>
</tbody>
</table>

2010 Patient Protection and Affordable Care Act

FY 15 Hospital Value Based Purchasing (VBP) Program

Further tie HACs to reimbursement

HACs included in VBP:
- Adverse Drug Event (medication errors)
- Catheter-Associated Urinary Tract Infections
- Central Line Associated Blood Stream Infections
- Injuries from Falls and Immobility
- Surgical Site Infections
- Ventilator-Associated Pneumonia

Each year measures will be added, many of which will target hospital-acquired conditions and other patient safety indicators.
AN ACCIDENT CAUSATION MODEL

The Swiss Cheese Model

Adverse Event

Sharp End
Active Failures

Layers of Defense

Blunt End
Latent Conditions

Hazard

Adapted from Reason, 1991
The diagram illustrates the concept of designing for safety in the healthcare facility design process. It shows the trade-offs between strategic planning and master planning on the one hand, and the need for retrofits and enhancements on the other. The key points are:

- **Proactive Design**: Safety through ease of safety implementation.
- **Need for Retrofitting**: Enhancements, focusing on cost of safety implementation and ongoing costs of adverse events.

The project lifecycle is represented as a percentage of construction time, with phases such as strategic planning, design development, construction documents, bidding, construction, commissioning/punch list, and occupancy.

(Based upon Taylor, Hignett, and Joseph, 2014)
An umbrella for safety

- Infection Control (ICRA)
- Patient Handling (PHAMA)
- Psychiatric injury
  (formerly in specialty hospitals)
- Medication safety
- Falls
- Security
- Immobility
1.2-3.1.1.1 All health care facility projects shall be designed and constructed to facilitate the safe delivery of care.

1.2-3.1.1.2 To support this goal, an interdisciplinary team shall develop a safety risk assessment.
A1.2-3 Safety risk assessment (SRA). The SRA is a **multidisciplinary**, documented assessment process intended to **proactively** identify hazards and risks and **mitigate underlying conditions** of the built environment that can contribute to adverse safety events. These adverse events include infections, falls, medication errors, immobility-related outcomes, security breaches, and musculoskeletal or other injuries. The SRA process includes evaluation of the **population at risk** and the **nature and scope of the project**; it also takes into account the models of care, operational plans, sustainable design elements, and performance improvement initiatives of the health care organization. The SRA **proposes built environment solutions** to mitigate potential risks and hazards.

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The governing body shall provide an assessment of the potential harm to patients and identifying the following:

- Specific hazards
- Hazard based on historical data and/or national industry patient and caregiver safety trends
- A prioritization of the degree of potential harm to patients and/or caregivers from the hazards identified
# Safety Risk Assessment (SRA) Components

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Facility Type/Area</th>
<th>Project Scope</th>
<th>Guidelines Reference</th>
</tr>
</thead>
</table>
| Infection control risk (ICRA)           | All                                                    | 1. New construction  
2. All renovations                                                           | 1.2-3.2              |
| Patient handling and movement (PHAMA)   | Areas where patient handling, transport, transfer, and movement occur | 1. New construction  
2. Major renovation and renovations changing functional use of space  
3. Minor and minimal renovations where patient handling occurs | 1.2-3.3              |
| Fall prevention                         | Any area to which a patient or family member has access | 1. New construction  
2. Major renovation and renovations changing functional use of space  
3. Minor and minimal renovations where patient falls may occur  
1. New construction  
2. Major renovation and renovations changing functional use of space  
3. Minor and minimal renovations where medication preparation, processing, and distribution occurs | 1.2-3.4  
1.2-3.5 |
| Medication safety                       | Medication safety zones                                | 1. New construction  
2. Major renovation and renovations changing functional use of space  
3. Minor and minimal renovations where medication preparation, processing, and distribution occurs | 1.2-3.5              |
| Behavioral and mental health risk       | Any area where behavioral health patient care is provided | 1. New construction  
2. Major renovation and renovations changing functional use of space to include care of behavioral health patients  
3. Minor and minimal renovations where behavioral health patient treatment occurs | 1.2-3.6              |
| Patient immobility                      | Inpatient locations                                   | 1. New construction  
2. Major renovation and renovations changing functional use of space to inpatient use  
3. Minor and minimal renovations where inpatient care occurs | 1.2-3.7              |
| Security risk                           | All                                                    | 1. New construction  
2. All renovations                                                           | 1.2-3.8              |
<table>
<thead>
<tr>
<th>EXPERT</th>
<th>SAFETY COMPONENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Infection control</td>
</tr>
<tr>
<td>Frontline caregivers from clinical</td>
<td>✓</td>
</tr>
<tr>
<td>departments affected by the project</td>
<td></td>
</tr>
<tr>
<td>Facility management staff</td>
<td>✓</td>
</tr>
<tr>
<td>Performance and/or quality improvement</td>
<td>✓</td>
</tr>
<tr>
<td>experts</td>
<td></td>
</tr>
<tr>
<td>Safety specialists</td>
<td>✓</td>
</tr>
<tr>
<td>Security specialist(s)</td>
<td>✓</td>
</tr>
<tr>
<td>Infection preventionists</td>
<td>✓</td>
</tr>
<tr>
<td>Architects, interior designers, and/or</td>
<td>✓</td>
</tr>
<tr>
<td>engineers</td>
<td></td>
</tr>
<tr>
<td>Human factors specialists</td>
<td>✓</td>
</tr>
<tr>
<td>Other appropriate individuals based on</td>
<td>✓</td>
</tr>
<tr>
<td>nature of the project</td>
<td>As needed</td>
</tr>
</tbody>
</table>
Three year AHRQ* seminar grant

Develop an SRA toolkit that can be used to conduct a proactive safety risk assessment during the healthcare facility design process.

Develop whitepapers and guidelines to support the use of the SRA and to detail the process for implementing it across the facility life cycle.

Further develop a Safe Design Roadmap for healthcare CEOs and integrate with the SRA toolkit.

Create an education platform for successful SRA activities.

*Agency for Healthcare Research and Quality
2013
Safe Design Roadmap & SRA Tool Development
Seminar MedStar Institute for Innovation (June 2013)

2014
SRA Tool Validation & Integration
Seminar Kaiser Permanente’s Garfield Innovation Center (May 2014)

2015
SRA Toolkit Dissemination & Evaluations
Dissemination and training at ASHE PDC Summit (March 2015)

With additional seminar funding from:

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Safety Risk Assessment

- Patient Handling (existing)
- Security
- Infection Control (existing)
- Psychiatric Injury (existing)
- Medication Safety
- Immobility (not included in tool)

And the C-Suite Safe Design Roadmap

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### Literature Review (6 risk components):
Research, literature reviews, expert opinion consensus document

<table>
<thead>
<tr>
<th>Citation (APA)</th>
<th>Study design</th>
<th>Results (general); note separate comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tzeng, H.-M., &amp; Yin, C.-Y. (2010). Adding additional grab bars as a possible strategy for safer hospital stays. Applied nursing research : ANR, 23(1), 45–51.</td>
<td>recommendations</td>
<td>The fixed augmentation of high-level patients with different body height on the floor in all areas commonly results in inpatient falls in the areas commonly visited by patients’ bathrooms, and hallway facilities related to grab bars and height-adjustable beds. Patients need to travel to reach the washroom, grab bars or handrails. Support for patients; assumption of support not documented in the study.</td>
</tr>
<tr>
<td>Van Leeuwen, M., Bennett, L., West, S., Wiles, V., &amp; Grasso, J. (2001). Patient falls from bed and the role of bedrails in the acute care setting. Australian Journal of Advanced Nursing, 19(2), 8-13.</td>
<td>Retrospective observational study</td>
<td>For all age-gender groups, the risk of falls was found to be higher than or equal to when body height and injury severity. Incomplete data on support intervention.</td>
</tr>
</tbody>
</table>
Literature Review (6 risk components):
Research, literature reviews, expert opinion, consensus document

Consensus (70%)
The lit review found this design feature/characteristic was relevant to multiple types of nursing units, including med/surg.

**RATIONALE:**

Numerous studies suggest locating higher risk patients closest to the nurse station. While this may seem operational, the design can support improved visibility and proximity through the specific location of nurse stations (e.g. decentralized); the location of charting (e.g. bedside); visibility of the patient head; visibility from the corridors with a normal walking pattern, and supplementing the layout with technology when needed to provide improved visibility.

**QUESTION:**

Does the unit shape and configuration allow visibility to all patient rooms, including with a normal walking pattern? (R, Fa)

1. Do you think this item should be included?
   - Yes
   - No

2. Optional: Why or why not?

3. Do you agree with the wording?

   "Does the unit shape and configuration allow visibility to all patient rooms, including with a normal walking pattern?"

   - Yes
   - No

4. Optional: Suggested rewording

Two survey rounds: Developing consensus from literature review findings
Unresolved content brought to seminar for consensus
Literature Review (6 risk components): Research, literature reviews, expert opinion, consensus document

Consensus (70%)

Final Content
<table>
<thead>
<tr>
<th>Topic area</th>
<th>First draft</th>
<th>Survey #1 result</th>
<th>Survey #2 result</th>
<th>Seminar result</th>
</tr>
</thead>
</table>
| **HAI**                     | 49 questions| • 13 respondents  
• 11 questions with 70% agreement on inclusion and wording  
• 20 questions with agreement on inclusion but not on wording  
→ Survey #2  
• 16 with 30-70% agreement on inclusion  
→ Survey #2  
• 2 questions deleted  
• 1 question combined with another | • 12 respondents  
• 9 more questions with 70% agreement on inclusion and wording  
• 12 questions with agreement on inclusion but not on wording  
→ Seminar  
• 13 with 30-70% agreement on inclusion  
→ Seminar  
• 1 question deleted | • 8 participants  
• 12 more questions with consensus on inclusion and wording  
• 13 questions to be further revised, some will be combined  
→ Total 32 questions with 12 more to be revised |
| **Patient handling & movement** | 22 questions | • 13 respondents  
• 9 questions with 70% agreement on inclusion and wording  
• 12 questions with agreement on inclusion but not on wording  
→ Survey #2  
• 1 with 30-70% agreement on inclusion  
→ Survey #2  
• 1 added based on comments | • 14 respondents  
• 8 more questions with 70% agreement on inclusion and wording  
• 5 questions with agreement on inclusion but not on wording  
→ Seminar  
• 1 question deleted | • 8 participants  
• 4 more questions with consensus on inclusion and wording  
• 1 deleted  
→ Total 21 questions |
| **Medication safety**       | 31 questions | • 15 respondents  
• 12 questions with 70% agreement on inclusion and wording  
• 13 questions with agreement on inclusion but not on wording  
→ Survey #2 | • 13 respondents  
• 11 more questions with 70% agreement on inclusion and wording  
• 4 questions with agreement on inclusion but not on wording  
→ Seminar | • 8 participants  
• 7 more questions with 70% agreement on inclusion and wording  
• 3 deleted  
→ Total 30 questions |

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Multiple scenarios at the Garfield Center for Innovation with expert workgroups
3 pilot sites with design projects: Barnes-Jewish Hospital, UC Irvine Medical Center, Memorial Sloan Kettering Cancer
It is intended to be:

- Proactive through early use
- Systematic, to focus on safety
- A discussion tool and prompt

With the potential for:

- Feedback loops
- Priority goal-setting

It is not intended to be:

- Prescriptive
- A checklist or score
- A “one and done”
- Absolute truth, but a starting point for verification
What you put in influence what you get out

This tool is not intended to be a guarantee of a safe environment; the environment is one part of a safety solution that includes operational policies and procedures and behavior of people.

The toolkit is intended for use with collaborative input of project and facility-based expertise.

This tool is also not a comprehensive list of guideline requirements but provides an overview of certain considerations and their relationship to safety.
3 MAIN STEPS

**Prep & planning**
- Project scope
- Project phases
- Team organization
- Safety goals
- Timeline
- Process integration

**Using the SRA**
- Tool content
- Interdisciplinary sessions
- Documentation

**Actions after the SRA**
- Design improvements
- Feedback
- Post-occupancy measures
Understand organizational strategic direction
Identify key safety goals
Review known safety issues in the organization
   Historical data, risk management
Determine SRA components to be considered
Construction type

**New**
Comprehensive coverage based on potential patient population

**Replacement**
May focus on known safety issues at a particular facility

**Renovation/expansion**
Focus on known safety issues in the facility & addressing risks involved with renovation/construction
Communicate purpose
Gain leadership buy-in
Establish timeline for maximum input
  Determine follow up phases
Coordinate with other tools or processes
  (e.g. lean/future state mapping, FMEA)
Designing for Patient Safety: Developing Methods to Integrate Patient Safety Concerns in the Design Process

Funding for this seminar was made possible (in part) by grant 1R13-HS020922-01A1 from the Agency for Healthcare Research and Quality (AHRQ). The views expressed in this report do not necessarily reflect the official policies of the Department of Health and Human Services; nor does mention of trade names, commercial practices, or organizations imply endorsement by the U.S. government. We would also like to acknowledge the Foothills Foundation Institute for its financial and intellectual support for this project.

Principal Investigator
Anup Gupta, PhD, EDAC

Team Members
Xiaobo Ou, PhD, EDAC
Ellen Taylor, AIA, MBA, EDAC
Matthew Juleen, EDAC

Organization
The Center for Health Design

Project Dates
7/1/2011 – 2/29/2012

Project Officer
William Freeman

Grant Award Number
1R13-HS020922-01A1

Multi-disciplinary team

Leadership – key to the success of SRA
Experts - Internal staff e.g. infection prevention, Quality improvement
Design – design team e.g. architecture, interiors, engineering, construction
Staff Participants - front-line clinicians, support staff, etc.
Patients and families
External subject matter experts

Consider scheduling and resources
People: internal and external expertise
Time: staff and design team consultants
Money: funding for external consultants/facilitators (if used)
Pre-design

Master planning

Programming

Design

Schematic

Design development

Construction documents

Construction

Occupancy

C-Suite engagement:
Safe Design Roadmap

Review SRA components for space and budget implications

SRA component considerations to ensure the inclusion of key safe design features

Check-ins over project life cycle to add detail, verify inclusion

Safe Design Roadmap
How much to tackle

- All at once (if scope allows) or
- By section with time to reflect

Time

- Probably not more than 3 hours per sitting

Format options

- Use projector to view the tool on screen
- Have someone to enter comments
- Provide overall facilitation by someone familiar with content
  - In-house (e.g. capital planning)
  - External – neutral third party
- Consider subject matter expert (SME) leads for topics

Allow time for discussion, sharing, and education
### Risk data and design considerations

- 100: infection control
- 200: medication safety
- 300: falls
- 400: patient handling
- 500: behavioral health/psychiatric injury
- 600: security

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Safety Risk Assessment (SRA) for healthcare facility environments

This toolkit has been created through a consensus process of experts in the safety risk areas. The Center for Health Design extends its gratitude to all the volunteers that supported content development and testing. The Center also thanks the three pilot sites who made their project teams available for testing: Barnes-Jewish Hospital, University of California Irvine Medical Center, and Memorial Sloan Kettering Cancer Center.

DISCLAIMERS: This tool is not intended to be a guarantee of a safe environment; the environment is one part of a safety solution that includes operational policies and procedures and behavior of people. It is intended for use with collaborative input of project and facility-based expertise. This tool is also not a comprehensive list of guideline requirements but provides a high-level overview of certain considerations and their relationship to safety.

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The Center for Health Design: 1850 Gateway Boulevard, Suite 1083; Concord, California 94520 USA; Phone: 925.521.9404; Fax: 925.521.9405
It may seem overly simple to indicate a list of safety features that can improve safety, but patient safety begins with an awareness of safety features maintained within the facility. Poorly designed and operated healthcare environments contribute to adverse events and subsequent patient harm, such as healthcare associated infections, medication errors and patient falls.

A large and growing body of evidence indicates that the physical environment impacts patient and staff safety, as well as stress and satisfaction; staff effectiveness; and organizational resource outcomes in hospitals and other healthcare settings. Facility replacement and renovation projects provide an opportunity to identify and mitigate or eliminate built environment latent conditions that lead to active failures impacting patient safety.

The goal of this tool is to provide guidance to consider the underlying (latent) conditions that can lead to harm. This tool supports the requirement for a safety risk assessment (SRA) found in the 2104 FGI Guidelines for Design and Construction of Hospitals and Outpatient Facilities.

There are six components of consideration: infection control, patient handling, medication safety, falls, behavioral health, and security. You may want to get started by looking at some high-level concepts and considerations in the Safe Design Roadmap.

### Skip the Safe Design Roadmap:
#### Get Started with Project Information

### Take Me to the Safe Design Roadmap

---

<table>
<thead>
<tr>
<th>Infection Control</th>
<th>Patient Handling</th>
<th>Falls</th>
<th>Medication Safety</th>
<th>Behavioral Health</th>
<th>Security</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Infection Control" /></td>
<td><img src="image2.png" alt="Patient Handling" /></td>
<td><img src="image3.png" alt="Falls" /></td>
<td><img src="image4.png" alt="Medication Safety" /></td>
<td><img src="image5.png" alt="Behavioral Health" /></td>
<td><img src="image6.png" alt="Security" /></td>
</tr>
</tbody>
</table>
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 associated infections, medication errors and patient falls. Facility replacement and renovation projects provide an excellent opportunity to proactively identify and eliminate building risks. Designing a healthcare facility is a complex process, which requires a core balance of many priorities. From the first moment a facility project is considered, it is critical to make safety a priority, so that safety issues are immediately identified, and become a central focus of all subsequent planning, design and construction activities. It is usually cost-prohibitive to address the design-related safety concerns once a building is under construction, built or occupied. There are significant financial advantages of designing for safety.

The Safe Design Roadmap provides a tool that enables CEOs and leadership teams to identify and implement key strategies that ensure their facility project is strongly focused on patient and staff safety. Completing this self-assessment tool, modeled on the American Hospital Association’s Second Curve Road Map for Health Care, helps leaders ensure that an organization’s strategy to use evidence-based practices to improve quality and patient safety are integrated.

The companion Safety Risk Assessment (SRA) tool is used by the multi-disciplinary facility project team, providing them with more evidence-based information about how to use built environment design to help mitigate the following safety issues: healthcare-associated infections; patient falls; medication safety; patient handling and movement; patient immobility; security and elolement and behavioral health and psychiatric injury. In addition to patient safety, both tools also focus on staff safety, as an important project.

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**Definitions of Project Phases**

1. **Strategic & Operational Planning.** This phase reflects the organization’s high-priority strategies, supported by a concept of operation achieved through the creation of operational planning and performance improvement projects to realize patient and staff safety.

2. **Programming & Design.** During the program and design phase, the concept of operations is translated into the amount of space required and then the design of the facility itself. Designs are submitted in an iterative fashion, beginning with more general designs, such as block adjacency drawings (e.g., Radiology is located next to the emergency department), to the specific, such as hardware specification and

3. **Construction & Commissioning.** Construction, which sometimes begins before the design is finished, includes the clearing of the site and all activities involved in actually building the facility, including the placement of some built-in equipment and furniture. During the commissioning phase, the building is outfitted with all additional equipment, furniture, medical and administrative

4. **Support.** The phase begins with occupancy of the building and includes all of the routine maintenance and repair activities necessary to keep the building in good working order over the life of the building.

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![Cost Influence Curve](image.png)

*Figure 1: The SRA Cost Influence Curve (Based upon Taylor, Hignett, and Joseph, 2014)*

---

Links to following pages:
- Home
- Project data
- Risk Component Links
- Glossary, and
- Roadmap questions
### Assess the organization on the statements to the right on a scale of 1-3

<table>
<thead>
<tr>
<th>Phase</th>
<th>Rating Scale</th>
<th>Key Safety Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red (1): Not developed or just starting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>We focus on safety as both a strategic and operational goal, as reflected in our mission, vision and values’ statements.</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>We examined root cause analysis and other performance improvement projects to identify safety improvement opportunities.</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>We identified specific safety goals for the project (e.g. reduce patient healthcare-associated infections, falls, medication errors, staff musculoskeletal injuries, injuries associated with patient and staff movement).</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>We evaluated the impacts on reimbursement (e.g. CMS’ Inpatient Prospective Payment System and Hospital Value Based Payment Program) consequent to present safety outcome results.</td>
</tr>
<tr>
<td>Yellow (2): In process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>We identified fiscal improvement targets for safety outcomes that the project will help to achieve.</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>We began an RDI for equipment purchases (e.g. ceiling mounted lifts, ultraviolet gamma irradiation) needed to support identified safety goals.</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>We considered the role that safety has on the brand recognition of our organization.</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>We included safety as a key priority in the guiding principles for the project.</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>We hired an A-E and project team with proven expertise in designing for safety.</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>We oriented the design team to our safety culture and priorities.</td>
</tr>
<tr>
<td>Green (3): Fully developed, working well</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>We identified safety as a high priority during the visioning session used to launch the project.</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>The project vision and goals were communicated to key stakeholder groups (Board, Medical Staff, Staff, Patients, Community).</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>We ensured that the project team provided the key stakeholders with an overview of EBD features that research reveals contribute to improved safety.</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>We aligned processes of care using safety as a focus.</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>As appropriate, we assigned multidisciplinary staff members to support the facility project.</td>
</tr>
</tbody>
</table>

As an organization, where is there room for improvement? Score automatically calculated.
### Project Background Information and Data

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Initiated by (name):</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Construction

- [ ] New Construction
- [ ] Renovation changing function of space
- [ ] Major Renovation
- [ ] Minor/minimal renovation
- [ ] Other

#### Project


### Consider the location where there is a risk of the hazard components.

**All projects need to consider:**
- Infection Control
- Security

**Does your project include any of the following?**

- Areas where patient handling, transport, transfer, and movement occur?
  - Complete Patient Handling Assessment
- Areas where medication preparation, processing, and distribution occurs?
  - Complete Medication Safety Assessment
- Areas where behavioral health patient treatment occurs?
  - Complete Behavioral Health Injury Assessment
- Areas where a patient or family member may fall?
  - Complete Falls Assessment

---

General project information

Project description in more detail

Determine which components need to be assessed
<table>
<thead>
<tr>
<th></th>
<th>Risk Components</th>
<th>Risk Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection Control</td>
<td>Infection Control Risk and Historic Data</td>
<td>Falls Risk and Historic Data</td>
</tr>
<tr>
<td></td>
<td>Infection Control Design Considerations</td>
<td>Falls Design Considerations</td>
</tr>
<tr>
<td></td>
<td>Infection Control Risk Assessment (ICRA)</td>
<td>CDC report - Slips, Trips, and Falls: Workers (outside link)</td>
</tr>
<tr>
<td></td>
<td>Matrix of Precautions (tab in file)</td>
<td></td>
</tr>
<tr>
<td>Patient Handling</td>
<td>Patient Handling Risk and Historic Data</td>
<td>Behavioral Health and Psychiatric Injury Risk and Historic Data</td>
</tr>
<tr>
<td></td>
<td>Patient Handling Design Considerations</td>
<td>Behavioral Health and Psychiatric Injury Care Operations</td>
</tr>
<tr>
<td></td>
<td>Patient Handling and Assessment White Paper (outside link)</td>
<td>Behavioral Health and Psychiatric Injury Care Operations</td>
</tr>
<tr>
<td>Medication Safety</td>
<td>Medications Safety Risk and Historic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medication Safety Design Considerations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>USP General Chapter &lt;1066&gt; Physical Environments (outside link)</td>
<td>Security Design Considerations</td>
</tr>
</tbody>
</table>

Link to risk component data page to evaluate risk level
Link to risk component design page to assess design
Link to other relevant information
Infection control includes airborne, surface and water transmission issues. The CDC and Patient Safety & Quality Healthcare sites including National Nosocomial Infections Surveillance (NNIS) provide information about statistics and the implications of infections. Risks for specific HAI's are associated with multiple factors including building construction type, healthcare service types, and patient populations.

For at-risk populations, identify potential harms and areas within the proposed project associated with those potential harms. Consider the patient risk groups (spaces) to be affected and the potential outcomes, including during construction. Is the likelihood rare or almost certain? Is the consequence negligible or minor injury or a sentinel event?

The degree of potential harm related to HAI's may vary across at risk populations and other factors. An organization may invest more resources in areas associated with relatively higher degree of potential harm. A panel of experts created a generic level of risk, but this should be considered with respect to your own organization and patient demographic. You might consider a typical "heat map" throughout your decision process. A sample is shown.

<table>
<thead>
<tr>
<th>Consequence</th>
<th>Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sentinel event</td>
<td>Rare</td>
</tr>
<tr>
<td>Partial Disability</td>
<td>Unlikely</td>
</tr>
<tr>
<td>Medical Treatment</td>
<td>Possible</td>
</tr>
<tr>
<td>First aid</td>
<td>Likely</td>
</tr>
<tr>
<td>No injury or disability</td>
<td>Almost Certain</td>
</tr>
</tbody>
</table>

See the ICRA Matrix of Precautions for Construction & Renovation for assessing risk consequence and likelihood.

Evaluate historical data to ascertain all conditions (e.g. construction type, service type, patient populations) that contribute to HAIs in both inpatient and outpatient areas in your facility.

Past performance does not guarantee future results. Identify the likelihood of events, specific to the there patterns of vulnerability?

<table>
<thead>
<tr>
<th>Infection Type</th>
<th>Location/Unit Type</th>
<th>Rate</th>
<th>Subject Matter Expert Consulted (Name)</th>
<th>Title/Role</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### Tools: Safety Risk Assessment

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Location</th>
<th>Building Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Include physical separation isolation methods (e.g., aseptic work areas) in unit layout to prevent the transfer of pathogens from one patient to another.</td>
<td>EN</td>
<td>Unit Layout</td>
</tr>
<tr>
<td>2</td>
<td>Include physical separation isolation methods in rooms to prevent cross-transmission between patients (e.g., single rooms, appropriate physical distance separation for multiple patients).</td>
<td>EN</td>
<td>Room Layout</td>
</tr>
<tr>
<td>3</td>
<td>Include adequate number of negative pressure isolation rooms for high-risk, ventilated, or ventilated-isolated patients in the patient care areas.</td>
<td>EN</td>
<td>Unit Layout</td>
</tr>
<tr>
<td>4</td>
<td>Include adequate number of positive pressure isolation rooms for high-risk, ventilated, or ventilated-isolated patients in the patient care areas.</td>
<td>EN</td>
<td>Unit Layout</td>
</tr>
<tr>
<td>5</td>
<td>Provide a sufficient number of hand hygiene devices to support convenient use by staff, patients, and families. (This consideration is also relevant under the following categories: room layout.)</td>
<td>EN</td>
<td>Unit Layout</td>
</tr>
<tr>
<td>6</td>
<td>Designate a single patient bathroom for each patient for the duration of their stay in the room.</td>
<td>EN</td>
<td>Room Layout</td>
</tr>
<tr>
<td>7</td>
<td>Design room layout to allow easy visual and physical access to hand hygiene devices (e.g., sinks, alcohol hand rub dispensers).</td>
<td>EN</td>
<td>Room Layout</td>
</tr>
<tr>
<td>8</td>
<td>Position sink location so that splashes from the sink cannot reach the patient zone or clean supplies.</td>
<td>EN</td>
<td>Room Layout</td>
</tr>
</tbody>
</table>

### Design Considerations

- **Rationale:**
  - The contamination of linen and other supplies increases the risk of infection. Physical separation (e.g., a separate aseptic work area) is an important method of preventing the transfer of pathogens from one patient to another.
  - Direct and indirect contact constitute a major route of pathogen transmission between patients (Cheng & Nelson, 2000). Reducing the chances of direct and indirect contact between patients through physically separating and isolating patients, especially the provision of single-bed patient rooms, has been associated with significantly lower risks of nosocomial infections and better health outcomes (MacKenzie et al., 2007; McMahan, Mason, Mediavilla et al., 2006). Patients stayed in single rooms were recorded to increase the risk of infections among patients and staff in nearby spaces (Gustafson et al., 1992; Hutton, Strong, Caulfield, Block, & Ewing, 1993). Research strongly suggests that air-borne infectious agents should be isolated in negative-pressured rooms to minimize the risk of cross contamination by preventing contaminated air from spreading beyond the surgeon's zone into the isolation room.

- **How is this done?**
  - Hand hygiene is considered the single most important method of infection prevention because pathogens are often transferred via the unhygienic hands of staff, patients, and families. The number of hand hygiene devices is an important factor significantly impacting hand hygiene performance. More sinks, gel dispensers, and other hand hygiene devices likely make it easier for staff, patients, and families to gain access to the devices and clean their hands. This may help to reduce the risk of transmission of pathogens discharged from one patient and contribute to the transmission to the pathogens to other patients who use the same bathroom during the same time period. Even in bathrooms less frequently used by patients, pathogens could be introduced through staff hands or used equipment and supplies. Single-patient bathrooms may help reduce cross contamination and improve environmental cleanliness.

- **Location:**
  - EN - General Location
  - Unit Layout
  - Room Layout
<table>
<thead>
<tr>
<th>Item #</th>
<th>Explanatory text in comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Include physical separation/isolation methods (e.g. separate soiled workroom, supply chain flow separation) in unit layout to prevent contamination of clean supplies and equipment.</td>
</tr>
<tr>
<td>X</td>
<td>Include physical separation/isolation methods in rooms to prevent cross-transmission between patients (e.g. single room, appropriate physical distance/separation between roommates if multi-bed rooms are used).</td>
</tr>
<tr>
<td>X</td>
<td>Include adequate number of negative isolation rooms for air-borne infectious patients in patient care areas based on projected number of such patients during normal and contingent surge operations.</td>
</tr>
</tbody>
</table>

**Rationale shown as comments to design considerations**

**Field for explanations**

**Location, building category filters**
Your estimated risk, entered by a drop-down menu – the selection will color code; this is independent of what is feasible.

Your estimated priority – it may be limited by site specific conditions; this is also color coded.

Your estimated cost magnitude; this will also color code.
<table>
<thead>
<tr>
<th>home</th>
<th>Risk Data: Falls</th>
<th>Project Data</th>
<th>The Risk Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research</td>
<td>Consensus</td>
<td>Opinion</td>
<td>Sort #</td>
</tr>
<tr>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>Protect entrance by walk-off route</td>
<td>Sort A to Z, Z to A, by Color</td>
<td>Med-High, M: ++, M: $</td>
</tr>
<tr>
<td>X</td>
<td>Design universal restrooms that are easily seen and accessible</td>
<td>Filter by Color, Text Filters</td>
<td>Highest, H: +++</td>
</tr>
<tr>
<td>X</td>
<td>If direct viewing of patients is necessary, consider monitoring station setup</td>
<td>(Select All), Highest, Lowest, Med-High, Med-Low</td>
<td>Med-Low, L: +</td>
</tr>
</tbody>
</table>

Sort functionality available for most fields at the heading drop-down.

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Design Phase Term | Definition
--- | ---
**Strategic planning** | A strategic plan helps hospitals and systems adapt to market conditions and changes in healthcare environments. The CEO along with the Board of Directors has a leadership role in creating the strategic plan, which includes the development of the organization’s mission, vision, strategy, and values statements; defining the critical strategic issues, making the transition from planning to implementation, communicating and rolling out the plan’s findings and recommendations, and conducting an annual strategic plan updates as part of an ongoing management process. (Synthesized from Healthcare Strategic Planning, Second Edition, Alan M. Zuckerman, FACHE, FAAHC).


Continuous improvement

Use SRA results to improve building design
  High priority items – immediate actions taken to improve design
  Medium and low priority - documentation

Reporting of SRA results

  Internal: leadership and staff
  External: Accreditation bodies and Regulators/Authorities Having Jurisdiction (AHJs)
    Varies by state – no “set” process

Post-Occupancy Evaluation

  Evaluation of the effectiveness of implementation
  Monitoring the change of safety goals and needs
Possibilities

- Updating design considerations based on research and practice
- Expand to cover additional safety issues
- Understand system interactions
  - Operations (care processes and policy)
  - People (staff and patients)
  - Environment
MANY THANKS TO ALL WHO PARTICIPATED!

The Core Team
Anjali Joseph, PhD, EDAC, former Director of Grants and Research Advisory Services, The Center for Health Design; Endowed Chair in Architecture+Health Design and Research, Assoc. Prof. of Architecture, Clemson University
Ellen Taylor, AIA, MBA, EDAC, Director of Research, The Center for Health Design
Xiaobo Quan, PhD, EDAC, Senior Research Associate, The Center for Health Design
Upali Nanda, PhD, Assoc. AIA, EDAC, former Research Consultant, The Center for Health Design; Vice President and Director of Research, HKS Inc. / Executive Director, CADRE
Catherine Ancheta, Project Manager, The Center for Health Design
Debra Levin, EDAC, President and CEO, The Center for Health Design

Advisory Council (listed alphabetically)
Doug Bonacum MBA, CSP, CPPS, VP, Quality, Safety, and Resource Management, Kaiser Permanente
Carol Corr, AIA, EDAC, LEED, Green Associate Design Manager, Facilities Planning and Design, National Facilities Services Kaiser Permanente
Terry Fairbanks, MD, MS, Director of the National Center for Human Factors Engineering in Healthcare, and Acting Director of the Simulation & Training Environment Laboratory (SiTEL), MedStar Institute for Innovation (MI2)
Ella Franklin, RN, CRC, EDAC, Director, Infection Prevention Research and Innovation, MedStar Institute for Innovation (MI2)
Tejas Gandhi, Chief Administrative Officer, The Medical Center of Central Georgia
John Kouletsis, AIA, EDAC, Vice President, Facilities Planning & Design, National Facilities Services, Kaiser Permanente
Jim Lussier, Founder & President, The Lussier Center
Eileen Malone, RN, MSN, MS, EDAC, Senior Partner, Mercury Healthcare Consulting, LLC (also a workgroup leader)
Chris McCarthy, MPH, MBA, Director, Innovation Learning Network
John Reiling, PhD, MBA, MHA, President & CEO, Safe by Design / Adjunct Professor, University of Minnesota, University of St. Thomas

Workgroup Leaders (listed alphabetically)
Maggie Calkins PhD, President & Board Chair, IDEAS Institute / Elliot Professor in Health Care Design, Kent State University, College of Architecture and Environmental Design
Linda Dickey, RN, MPH, CIC, Director, Epidemiology & Infection Prevention, UC Irvine Health
Mary Matz, MSPH, CPE, CSPHP, Consultant, Patient Care Ergonomics, Patient Care Ergonomic Solutions, LLC
Kelsey McCoskey, MS OTR/L, CPE, CSPHP, Ergonomist, Occupational Therapist, US Army Public Health Command
Mardelle Shepley, FAIA, EDAC, LEED AP, Professor - Design + Environmental Analysis, Cornell University College of Human Ecology
Tony York, CPP, CHPA, Chief Operating Officer, HSS
MANY THANKS TO ALL WHO PARTICPATED!

<table>
<thead>
<tr>
<th>Subject Matter Experts and Pilot Test Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Barnes-Jewish Hospital team in St. Louis, MO</td>
</tr>
<tr>
<td>The University of California Irvine Medical Center team in Irvine, CA</td>
</tr>
<tr>
<td>The Memorial Sloan Kettering Cancer Center team in New York, NY</td>
</tr>
<tr>
<td>Carmen Adams DNSc, RNC, Strategic Leader, Quality, Kaiser Permanente</td>
</tr>
<tr>
<td>David Allison FAIA, ACHA, Professor/Director, Graduate Studies in Architecture + Health Clemson University</td>
</tr>
<tr>
<td>Helen Archer-Duste RN, MS, Executive Director, Workplace Safety and Care Experience Kaiser Permanente</td>
</tr>
<tr>
<td>Angelene Baldi, AIA, EDAC, LEED GA, Planning Manager for Facilities Planning and Design, Kaiser Permanente</td>
</tr>
<tr>
<td>Sue Barnes RN, CIC, Infection Prevention and Control Quality and Safety Department, Kaiser Permanente</td>
</tr>
<tr>
<td>Donna Bohannon R. Ph., CPPS Scientific Liaison, U.S. Pharmacopeial Convention</td>
</tr>
<tr>
<td>Doug Bonacum MBA, CSP, CPPS, VP, Quality, Safety, and Resource Management, Kaiser Permanente</td>
</tr>
<tr>
<td>Sheila Bosch PhD, LEED AP, EDAC Director of Research, Gresham, Smith &amp; Partners</td>
</tr>
<tr>
<td>Barbara Braun PhD, Associate Director, Department of Health Services Research, Division of Healthcare Quality Evaluation, The Joint Commission</td>
</tr>
<tr>
<td>Rosalyn Cama FASID, EDAC President CAMA, Inc.</td>
</tr>
<tr>
<td>Pascale Carayon, PhD, Procter &amp; Gamble Bascom Professor in Total Quality Department of Industrial and Systems, Engineering, Director of the Center for Quality and Productivity Improvement University of Wisconsin-Madison</td>
</tr>
<tr>
<td>Satyan Chari, BOT, Grad Cert Occ Thy, M Sc Occ Thy, Program Coordinator - Falls Risk/OHMR, Research Fellow, Royal Brisbane and Women's Hospital, Queensland Health</td>
</tr>
<tr>
<td>Young-Seon Choi, PhD, March, Assistant Professor Department of Architecture, Kyungil University, South Korea</td>
</tr>
<tr>
<td>Eileen Costantinou, RN, MSN, BC, Practice Specialist, Senior Coordinator, Barnes-Jewish Hospital</td>
</tr>
</tbody>
</table>

| Tom Davis, Director of Facilities Management & Security, University of Colorado Hospital |
| Marie DePerio, Medical Officer, CDC/NIOSH |
| Lena Deter, RN, MPH, CSPHP, Clinical Specialist in Patient Safety, DELHEC LLC |
| Anthony Donaldson, CSPHP, National Environmental, Health and Safety Senior Staff Manager, Kaiser Permanente |
| Lori Dowling, President, ECORE Commercial Flooring |
| Jan Ehrenwerth, MD, Professor of Anesthesiology; Director, Vascular Yale University School of Medicine |
| Doug Erickson, FASHE, CHFM, HFDP, CHC, CEO, Facilities Guidelines Institute |
| Bill Felkey, BA, MS, Professor Emeritus, Auburn University |
| John Fishbeck, Associate Project Director, The Joint Commission |
| June Fisher, MD, Director, TDICT Project, Trauma Foundation/NIOSH |
| Guy Fragala, PhD, PE Senior Advisor for Ergonomics, Patient Safety Center of Inquiry |
| Susan Gallagher, RN, Bariatric Expert, Independent Consultant |
| John Grout, PhD, Dean, Campbell School of Business, Berry College |
| Ed Hall, MS, CSP, Chief Operating Officer, The Stanford University Medical Network Risk Authority |
| Kendall Hall, MD, MS, Scientific Director, MedStar SiTEL, MedStar Health |
| D. Kirk Hamilton, FAIA, FACHA, EDAC, Professor of Architecture, Texas A&M University |
| Eve Hanna, MD, MPH, Occupational Health Physician, James A Haley Veteran's Hospital |
| Daniel Hartley, Ed.D., Epidemiologist, NIOSH Workplace Violence Prevention Coordinator, NIOSH |
| William Heath, RPh, MBA, FAPhA, Col (retired), Consultant to USP, APhA, ASHP, Heath Healthcare Consulting, Inc., U.S. ARMY |
| Dennis Hemphill, CPP, System VP - Safety, Security, Emergency Management, Dignity Health |

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MANY THANKS TO ALL WHO PARTICIPATED!

Prof. Sue Hignett, PhD, Professor of Healthcare Ergonomics & Patient Safety, Postgraduate Programme Director for Ergonomics & Human Factors, Chair of Education & Training Panel, Chartered Institute of Ergonomics & Human Factors, Loughborough University

Robert Hody, Asst. Director, Lean Sigma Deployment Johns Hopkins Medicine

Vicky Hogue, RN, MSN, CCRN, EDAC, VP Patient Services/CNO, Wellstar Paulding Hospital

Daniel Horan, INCE, LEED AP BD+C, Senior Consultant, Cavanaugh Toci Associates, Inc.

Kimberly Hudson, RN, MSN, Safe Patient Handling Coordinator, Marion VAMC

Robert Hunn, MBA, CHFM, CHSP, LEED AP BD&C, EDAC, Director of EH&S, University of Kansas Hospital

Jim Hunt, AIA, NCARB, President, Behavioral Health Facility Consulting

Tamara James, CPE, Ergonomics Director, Duke University and Health System

Mandy Kachur, PE, INCE Board Certified Principal Consultant, Soundscape Engineering LLC

Hanneke Knibbe, MSc, RPT, Owner, LOCOmotion

Joe Kucharz, Director, Healthcare Real Estate, Navigant

Don MacAlister, CHPA, Vice President, Paladin Security

Jennifer MacDaniel, Project Principal, Innovations Group, Kaiser Permanente

Kathy Maher, RN, MSN, Manager, Employee Health Services, UW Medicine

Harborview Medical Center

Jain Malkin, CID, AAHID, EDAC, President, JAIN MALKIN INC.

Larry Malik, PhD, Professor, Western Michigan University

Kirsten Martin, RN, MBA, CHE, Consultant, Planning & Development, St. Michael's Hospital

Marie Martin, PhD, Industrial Hygienist (SPHM Facility Coordinator), VA North Texas Health Care System

Susan McCrone, PhD, RN, Professor and Coordinator. CDC/NIOSH

Kate McPhaul, PhD, MPH, RN, Deputy Chief Consultant, Occupational Health (10P3D) Office of Public Health, Veterans Health Administration

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MANY THANKS TO ALL WHO PARTICIPATED!

Erica Stewart, CIH, HEM, National Environmental, Health and Safety, Principal Consultant, Kaiser Permanente
Andrew Streifel, MPH, REHS, Hospital Environmental Specialist, University of Minnesota
Dana Swenson, Senior Vice President, Umass Memorial Medical Center
Terry Thurston, RN, BSN, MBA, Director, Healthcare Operations Planning, BSA LifeStructures
Rein Tideiksaar, PhD, PA-C, President, Fallprevent, LLC
Kevin Tuohy, Executive Director - Research Compliance, Boston University & Boston Medical Center
David Uhaze, RA, Chief - Bureau of Construction Project Review, State of NJ Department of Community Affairs
Susan Wagner-Debusman, RN, Employee Health Program Manager, Kaiser Permanente
Thomas Wallen, AIA, ACHA, Vice President, Healthcare Performance Partners, Inc.
Frank Weinberg, Corporate Assistant Vice President of Facilities, MedStar Health, Inc.
Salley Whitman, MHA, Director of Operations, NXT Health
Lynn Willis, MHA, MHA, Regulatory Compliance Programs Manager, UC Irvine Medical Center
Laurie Wolf, MS, CPE, Performance Improvement Engineer, Barnes-Jewish Hospital

and Additional Staff from The Center for Health Design
Alison Berger, Project Manager
Anna Gasparini, Office Manager
Carolyn Glaser, MA, EDAC, Director of Operations
Donna Deckard, BSN, MPA, EDAC, Director of Strategic Projects
Linda P. Franklin, Senior Marketing Communications Manager
Shannon Roecklein, Project Manager
We’re all ears
Call The Center for Health Design: 925.521.9404
Or visit the website: www.healthdesign.org