EXECUTIVE SUMMARY

PURPOSE OF STUDY
The purpose of this project was to:

1. develop and validate a patient room interior design checklist to support design decision making for three types of patient rooms (i.e. medical-surgical, intensive care, and maternity care),
2. develop and validate a patient room evaluation tool that can be used for existing facilities or renovation/new construction projects, and
3. facilitate access of the tools through developing easy-to-use tool interface available through Center for Health Design (CHD)’s website.

RESEARCH SUMMARY
Utilizing multiple methods including literature reviews and analyses, conceptual modeling, surveys, guidance and feedback from a multi-disciplinary advisory council, and usability tests, the patient room design checklists and evaluation tools that were developed cover 23 design goals and over 200 design features in an easy-to-use Excel spreadsheet format with built-in internal and external hyperlinks as well as filtering, customization, and automatic feedback functionalities. Pilot testers found the tools to be very helpful and effective in design and evaluation processes. All the design checklists and POE tools are currently available online through CHD’s website.

IMPLICATION HIGHLIGHTS
- Use research evidence as much as possible for design decision-making. The tool includes both research-based and best-practice-based design considerations and features. To differentiate, research-based items are marked with a tag ‘R’ with links to relevant research references while the best-practice recommendations are marked with a tag ‘B’.
- Use the patient room tools together with other design tools and methods to optimize design and create the best design solution for a particular construction project.
- Use the key design considerations and design features included in the checklist as basis for working with the facility owner to determine what are “adequate” or “sufficient” numbers (e.g. number of sinks) or sizes (e.g. room door size). No prescriptive numbers (e.g. space size or length of headwall) are provided because the optimized numbers depend on a thorough understanding of the needs of patient care and the constraints of project (e.g. operations and costs).
- Engage multi-disciplinary participation from all stakeholders.
PATIENT ROOM DESIGN
CHECKLIST AND EVALUATION TOOL

BACKGROUND
A growing body of empirical evidence indicates that well-designed built environments play a critical role in keeping patients safe and enhancing the quality of patient care\(^1\). Although substantial evidence is available to inform patient room design, research findings are often too technical for design practitioners to understand, interpret and apply in their projects. One major barrier to making research actionable is the lack of design and evaluation tools that are based on evidence, easy to use for translating research into design, and readily available to design professionals. A patient room interior design checklist and evaluation tool can address this critical need in the industry by providing access to the healthcare design evidence base in an accessible and actionable format.

METHODOLOGY
From February 2012 to January 2015, the CHD project team completed the project in three phases by using the following methods:

- Ongoing guidance and feedback from a 27 member multi-disciplinary advisory council including industry experts with various expertise
- Extensive literature reviews and analyses of research evidence around patient room design
- Creation of a conceptual model regarding relationships between design elements and healthcare outcomes based on research evidence
- Surveys among experts to examine the design goals and considerations that were important for the three types of patient rooms
- Development and continuous improvement of the tool content and format
- Usability tests of the design checklist and evaluation tools at two design firms and three hospitals
- Development of an interactive Excel spreadsheet format of the tool
- Development of a CHD webpage for access to the tools.

The checklists and POE tools are organized around 23 evidence-based design (EBD) goals (desirable healthcare outcomes impacted by building design). A series of design considerations and specific design features that support the achievement of each EBD goal are provided to facilitate design decision-making and a thorough check of key evidence-based design elements throughout the design stages and to evaluate how well a built patient room performs against key healthcare goals after construction and occupancy.

KEY FEATURES
The checklist and POE tools are currently in Excel format. Each checklist or POE tool includes three main parts:

- A cover page including key instructions and guidelines of how to use the tools.
- A home page serving as a central hub for accessing the evaluation tabs for EBD goals, prioritizing EBD goals for a particular project, and instantly showing the results of the evaluation on one page.
- Evaluation pages (tabs), each of which list the design considerations and features that support the achievement of one EBD goal.

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In addition, a list of key behaviors in a patient room by various users is included in the design checklist.

The checklists and POE tools include several key features for ease of use:

• Tool customization based on relative importance of EBD goals (Figure 1).

• Identification of research supported design features and hyperlinks to research evidence (Figure 2).

• Indication of overlapping and potential trade-offs between individual design features with hyperlinks between overlapping/conflicting items (Figure 2).

• Inclusion of specific design features as assessment aids to increase evaluation objectivity (Figure 3).

• Provision of spaces for adding notes/comments next to checklist or evaluation items (Figure 3).

PUBLICATIONS


PRESENTATIONS


RESEARCH TEAM BIO

Xiaobo Quan, PhD, is a Senior Researcher at The Center for Health Design. Dr. Quan’s work at CHD focuses on examining the impact of the built environment on human behaviors and healthcare outcomes by using rigorous scientific methods to evaluate the effects of evidence-based design innovations, creating tools and other resources for design optimization, and disseminating research findings through presentations and publications at national and international venues. Dr. Quan has been actively engaged in healthcare environment research for more than ten years and has published widely on topics of healthcare associated infection prevention, medication error reduction, patient safety, healthcare sustainability, work efficiency, and cost-effectiveness. Dr. Quan is also an experienced architect with years of professional work. He holds a doctoral degree in Architecture from Texas A&M University and two professional degrees in architecture from Southeast University in China.
Anjali Joseph, PhD, formerly the director of grants and research advisory services for The Center for Health Design, is currently endowed chair in architecture + health design and research and associate professor of architecture at Clemson University. A trained architect, Anjali has spoken at events worldwide spreading the word about CHDs work and resources. Her work focuses on understanding the relationship between the healthcare built environment and healthcare outcomes, specifically focusing on tools and guidelines that support the implementation of built environment research in healthcare practice to result in improved outcomes for patients, staff and families.

Catherine Ancheta manages the grant funded research projects that develop tools and resources for The Center for Health Design. She also manages the customer service and administration of EDAC (evidence-based design accreditation and certification) and the Affiliate program, as well as the project manager for the Pebble Project research initiatives. She has a Bachelor's degree in Economics from the University of California, Davis.