PERI–OPERATIVE NURSES' ASSESSMENT OF THE PHYSICAL ENVIRONMENT REGARDING CLINICAL EFFICIENCY, PATIENT SAFETY, AND STAFF SATISFACTION.

Laurie Waggener, RRT, CHID, IIDA, EDAC

Prof. Alan Hedge, PhD, CPE, C.ErgHF | Humanuse.com

Apoorva Rane, PhD | University of Wisconsin - Stevens Point

PROBLEM STATEMENT & PURPOSE

Construction of any healthcare project takes a gestational time period creating a lag between fast-paced changes in the care-delivery environments and architects' opportunity for conducting design research. Eliciting feedback from the front-line practitioner using Facility Performance Evaluations (FPE) followed by prompt dissemination of results, is pivotal in informing future design and construction efforts to meet clincial workplace needs in the Peri-Operative clinical workplace.

Purpose: A pre-move and post-move study was conducted to investigate the supportiveness of a new replacement / facility expansion project, designed by a multi-disciplinary team of clinicians and architects. In the context of a Planetree Gold-Certified Person-Centered Hospital where Evidence Based Principles were used to inform design solutions, a survey elicited the perceptions of the practitioners relative to meeting project goals: 1) patient safety, 2) clinical efficiency and 3) staff satisfaction.

LITERATURE REVIEW

Healthcare facility environmental design is based on prevailing and ongoing evidence-based, multidisciplinary research. Design strategies such as adequate lighting levels, access to hand washing sinks, and spaces for multidisciplinary team collaboration contribute to reducing medication errors, enhancing infection control, and improving efficiency (Ulrich et al., 2008). Similarly, visibility to patient beds, convenient access to support spaces, and nurse time at the bedside are associated with patient safety and satisfaction (Tucker et al., 2008). However, clinical and physical design requirements specific to peri-operative units were one of the under-researched topics in 2008. Therefore, the participation of the existing peri-operative staff and use of current Evidence-Based Design (EBD) strategies from the other departments were essential during design of replacement and expansion of the participating peri-operative facility.

Ulrich and colleagues (2010) emphasized the documented design interventions in the organization and participant outcomes framework. The original framework includes design variables, environmental qualities, organizational outcomes, confounding or control variables, and demographics (Ulrich et al.,2010). This EBD model for design was augmented by the person-centered guiding principles of Planetree Certification. (Planetree, n.d.; See Figure 1).

Peri-operative facilities support surgical activities and facilitate the patient pre- and post-procedures. Practitioners working in these units closely care for patients with several acuities, support families, transport patients, and equipment, and monitor patient vitals during recovery (Rutherford et al., 2009; Garrett, 2016). Hence, clinical efficiency, patient safety, and patient turnaround time are some tenants of the fast-paced peri-operative departments (Garrett, 2016). Long walking distance, pushing and pulling heavy equipment, varying patient acuity and room assignment locations are constitutional to their job (Apple & Letvak, 2021). Current literature in per-operative units emphasizes the need for enhanced facility planning through multidisciplinary collaboration and hands-on physical and virtual mockups (Torres- Landa et al., 2019).

RESEARCH QUESTION

What is the assessment of the front-line practitioner regarding the clinical workplace, which targeted safety, efficiency and overall staff satisfaction, in the context of using EBD / Planetree philosophies?

CONCEPTUAL FRAMEWORK

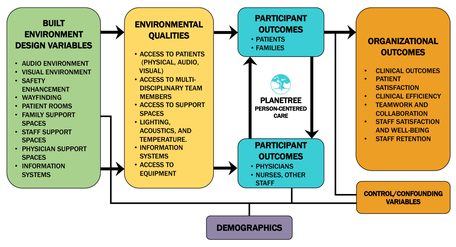


Figure 1. Conceptual Framework adapted from (Ulrich, Berry, Quan, & Parish, 2010; Planetree, n.d)

METHOD

During this pretests-posttest, multi-methods research, quantitative data were collected using the Facility Performance Evaluation survey. The survey constituted of 8 demographic items, 48 environmental attributes, and an open comments section. Qualitative data were collected using semi-structured focused group interviews, photography, and annotations. Exempt IRB approval was received. The data analysis was conducted by third-party consultants. Quantitative data was analyzed by Dr. Alan Hedge and qualitative data analysis was assisted by Apoorva Rane (Doctoral student at the time).

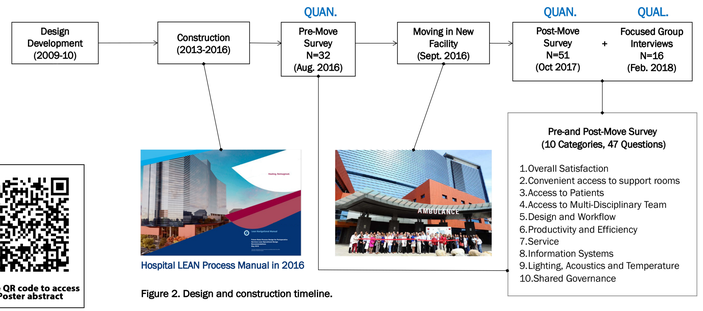
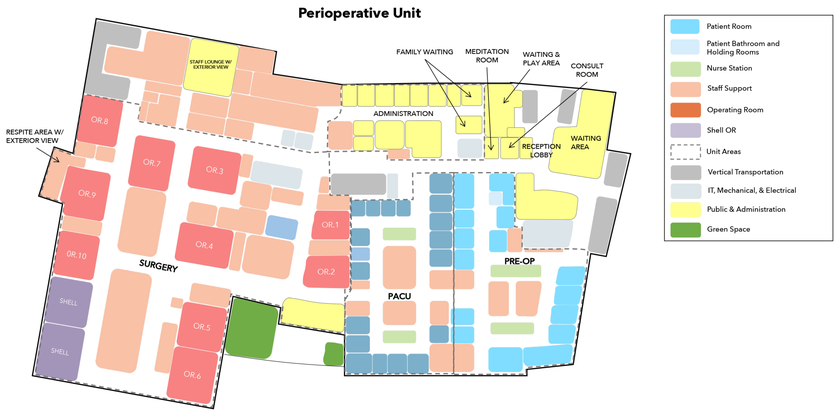


Figure 2. Design and construction timeline.

Scan the QR code to access the Poster abstract

RESEARCH SETTING



Item	PACU	Pre-Op	OR
Pre-Move	11 (curtained); 1 ISO 5 Hold = (17 PACU)	6 without toilet 3 CCU – CARDIAC Care – (9 Pre-op)	7 OR; 2 CVOR; 4 procedure room 1 Endo/bronc procedure room (9 ORs, 5 Procedure rooms) = 14
Post-Move	13 Curtained; 2 Ped 3 ISO; 2 Hold = (19 PACU)	12 without toilet 3 with toilet = (15 Pre-op)	4 OR; 2 Orth; 1 CVOR; 1 Hybrid; 1 bronchoscopy; 1 endoscopy; 2 shell; (10 OR + 2 Shells) = 12

Figure 3. Research setting. Pre- and post-move departmental room types

FIGURE 4.
PACU: OPEN BAY W/ CURTAIN
90 square feet

FIGURE 5.
PACU: ENCLOSED
Serves: Isolation, Pediatrics
120 square feet

1. Stretcher / Clinical Recliner
2. Waste Can, Bio-hazardous
3. Waste Can, Step-On
4. Sharps
5. Gloves – Triple Box
6. Procedure Cart
7. Compression Unit
8. Overbed Table
9. Physiologic Monitor
10. Warmer, Hypothermia
11. Television
12. Air
13. Oxygen
14. Suction

FIGURE 6.
PREP ENCLOSED (W/O RESTROOM)
Serves: Isolation, Pediatrics
136-162 square feet

FIGURE 7.
PREP ENCLOSED (W RESTROOM)
Serves:
Isolation, Pediatrics
136-162 square feet

RESULTS

DATA ANALYSIS

Survey results (QUAN) were analyzed using Chi-square tests and t-tests. Open-ended survey responses and focused group interviews (QUAL) were analyzed through content analysis. This research poster emphasizes frontline practitioners' expectations of the supportiveness of their work environments in terms of clinical efficiency, visibility, walking, room acuity, and flexibility needs due to room types.

Demographics

Job Description	Pre-move (n=32)	Post-move (n=51)
Clinical nurses	77.4% (24)	69.2% (36)
Surgical Tech	12.9% (4)	13.5% (7)
Clinical Assistant	0.0%	1.9% (1)
Other	9.6% (3)	15.4% (8)

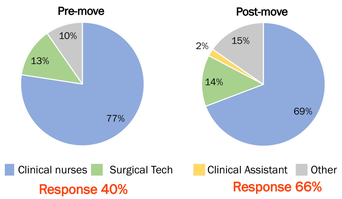


Figure 8. Participation from the peri-operative unit (pre and post datasets)

Productivity and Efficiency

The organization of the area around the bedside allows me to easily maintain sterile technique during daily processes (suctioning, IV set -up). [X^2 (5, N=48) = 11.641, p = 0.040]

Job description	Before Mean	After Mean
Pre-and Post Op	3.68	4.21

Nearly 80% of the practitioners assessed the area around the bedside facilitates sterile techniques and processes.
However, qualitative data revealed the PACU bays were shallow, needing ceiling mounted IV, use of gurney and recliners in Pre-op were problematic.

"We used to have it (IV) from the ceiling... the IV poles are so huge, on the wheel that it's like you have no room to move around all the bays here..." – Int.269

"There are specific rooms that we use for (blocks)... when you have a patient that needs to be in those particular rooms. And then you also have post-op patients coming back" (See Figure 10). – O.C.288

Shared Governance

The department /unit design affords access to key team members for coordination of the plan of care. [X^2 (5, N=78) = 17.313, p = 0.004]

Job description	Before Mean	After Mean
Pre-and Post Op	3.55	4.24

Most (<90%) of participants assessed that access to key team members to be convenient for collaboration and care delivery.

"We have a division between pre and post-op and the division is the center [hallway] that they put in between the two sides. It should be one fully functioning unit" – Int.273

"(Need a consult room) Obviously secure if there needs to be a private conversation between that person (patient/ family) and staff." – Int.58

Design and Workflow

Hand washing sinks throughout the unit are easily accessible and appropriately located. [X^2 (5, N=61) = 9.936, p = 0.042]

Job description	Before Mean	After Mean
Pre-and Post Op	3.54	4.00

More than 80% of participants perceived access to the handwashing sinks was convenient in Pre- and Post-Op.
More handwashing sinks are provided in the new PACU bay (See Figure 9). Interview discussion expressed access to supply to PPE over handwashing sink, like Acute Care units.

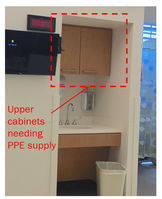


Figure 9. Handwashing sink in PACU

Figure 10. Prep room used for blocks

Other Findings/ Concerns

"So for a nurse who has a patient here (In the passage way between pre and post op) and here that's (visibility is) challenging." – Int.199

"They (Room #9 and 10) are interchangeable [In Prep]. ... If we have a lot of post-op patients we will utilize them for the post-op because it's convenient for the nurses." – Int.24

CONCLUSION

This study articulates the changing needs of peri-operative services due to the transforming clinical expectations. Front–line practitioners' responses to the open comments portion of the survey as well as focus group interviews offers needed insight regarding the Peri-Operative nurse for future innovative, physical design strategies for this fast-paced, often, critical care environment. More design research is needed to address the literature gap regarding clincial workplace needs from members of this important clinical specialty.

IMPLICATIONS FOR FUTURE

- Peri- operative staff require immediate access to supplies and PPE. Architects might consider the incorporating design solutions from the Acute Care and Critical Care environments while keeping an eye on square footage and construction costs. The addition of casework (wall hung cabinets or nurse servers) can address access to PPE while reducing visual clutter which occurs when supply accommodations are not provided.
- Given the four room types offered in this Peri-Operative setting, in which qualitative themes revealed need for flexibility in the accommodation for multiple levels of acuity while enhancing visibility and accessibility, is there an ideal patient room that can meet all the needs in the Peri-Operative patient journey?

Please scan the QR Code and share your comments with the authors to shape future research questions.

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