



KEY POINT SUMMARY

OBJECTIVES

The main goal of this study was to empirically test whether standardized same-handed room configurations allow for process and workflow practices to be more standardized than traditional, standardized mirror-image room configurations.

An Empirical Examination of Patient Room Handedness in Acute Medical-Surgical Settings

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Key Concepts/Context

The initial cost of designing hospitals with standardized same-handed patient rooms is typically much higher than the cost of hospitals designed with mirror-image configurations. This is because same-handed units require separate utility lines for each patient room rather than shared medical gas lines and bathroom plumbing lines between every two rooms. While some theories indicate that same-handed units may be linked with improved patient care through standardization of the physical environment and a resulting standardization of processes and workflow, the authors report a need for better empirical evidence to determine whether these increased expenditures are worthwhile and do in fact increase safety and patient outcomes.

Methods

In total, 10 right-handed and 10 left-handed female nurses participated in the study. A simulation training laboratory in a college of nursing at a large university was used to conduct the study, and it was designed as an acute medical-surgical unit setting. The simulation-based quasi-experimental design of the study meant that it did not take place in an actual hospital setting, and elements of the physical setting were manipulated to allow for comparisons of nurses' behaviors. In particular, by controlling the direction of the nurses' approach to the patient's bed, the researchers created right-handed, left-handed, and neutral-handed configurations. They also manipulated the location of an IV pole, placing it either on the patient's left, the patient's right, or removing it from the environment entirely.

The combinations of these two variables – direction of approach, and location of an IV line – created nine unique physical configurations within which each participant would complete specific tasks. The participants were asked to do three tasks in each



of the nine scenarios, all in a randomized order: check vital signs of the patient, suction the patient, and sit the patient up.

Aside from the variables that were manipulated, all else within the setting remained constant and controlled. This included the height of the patient bed, the bed angle, bedrails up, over-bed table stationed at the foot of the bed, suction canister on both sides of the bed, and the suctioning kit and Dynamap at the nurses' station.

All simulations were video recorded, and data was coded from a pre-set list of behaviors, including the nurse's direction of approach to the bed, hesitations in approach, use of over-bed table, and adjustments made to the bedrail, bed height, or bed angle. Specific postures were also noted by data coders: stretching, bending, instability, lifting, twisting, and repositioning. The researchers sought to answer two main questions: whether the nurses' location could be forced to be always on the right of the patient, and to learn whether the essence of familiarity in the patient care environment could be determined.

The researchers conducted a within-group comparison, meaning they could compare nurses' behaviors in one configuration to their actions in the other configurations. They analyzed the data to see if there were differences in nurses' behavior between the first scenario (open direction of approach and no IV) and the other eight scenarios. A Poisson regression analysis was then used to understand variables of frequency (e.g., noting certain postures like twisting). Also, a regression analysis was conducted to identify any differences between left- and right-handed groups.

Findings

The researchers found that right-handed and left-handed nurses acted significantly differently in 11 of 32 behaviors during the completion of tasks in the various scenarios. Yet in addition to handedness, there were two other factors that impacted nurses' actions significantly in the scenarios: the position of the IV pole, and the walking distance from the doorway. Most impactful was the location of the IV pole, with nurses choosing to avoid the IV pole in order to check vital signs, regardless of the location of the door and walking distance. In scenarios in which the IV pole did not obstruct nurses, they chose to take the shortest path to the patient bed. On the other hand, when sitting the patient up, nurses typically chose to do so on the side with the IV pole. In scenarios with no IV pole, nurses typically selected which side to approach based on the shortest distance from the door.

While handedness is important in nurses' decision-making about behaviors, all of these findings point to the way in which external physical environment factors influence nurses, regardless of handedness. Furthermore, there are multiple variables that seem to impact a nurse's decision of how to approach the patient bed, depending on the type of task; the researchers infer that this means the processes



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and workflows are not standardized, which has implications for limited beneficial impact of same-handed rooms.

Design Implications

One main conclusion is that if there is a desire to create units with configurations that might standardize tasks for nurses and create efficiencies and benefits of such standardization, there may be a need to concurrently or first standardize operations and processes for nurses. From a design standpoint, this study concludes that same-handed rooms are not yet found to significantly impact standardization as a stand-alone solution. At this point, definitive conclusions cannot be made about which type of room configuration most positively impacts standardization and the effect it might have on patient care and outcomes.

Limitations

One limitation of the study was the realization that a number of left-handed nurses claimed to be fairly ambidextrous when completing tasks, which might have impacted findings attempting to compare handedness. Additionally, the study did not incorporate measures of cognitive load, or anything about patient safety outcomes, limiting the conclusions that could be made.