



## KEY POINT SUMMARY

### OBJECTIVES

The purpose of the study was to compare three configurations of nursing unit—radial, single-corridor, and double-corridor—and examine their effects on nursing staff behavior and nurses' subjective feelings in a 570-bed hospital building.

### DESIGN IMPLICATIONS

The design of unit configuration and layout should take into consideration its potential impact on both patient and staff. While radial design may increase staff efficiency, its effects on patients and families need further research.

## Influence of Nursing-Unit Design on the Activities and Subjective Feelings of Nursing Personnel

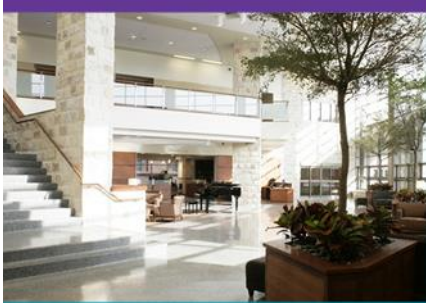
Trites, D.K., Galbraith, F.D., Sturdavant, M., Leckwart, J.F.  
*1970 | Environment and Behavior*  
*Volume 2, Issue 3, Pages 303-334*

### Key Concepts/Context

Nursing unit configuration and layout impact nursing staff work efficiency and the quality of care. Different configurations of unit, for example radial, single-corridor, and double-corridor (i.e. racetrack), have been claimed to be better than others in terms of facilitating patient care activities. Research on this topic has encountered difficulties because of the large number of confounding factors. Healthcare buildings are rarely or never built for research purpose therefore nursing units with different configurations almost always are different in some other physical features and/or operational factors such as staff and patient mix. In this study, a 570-bed hospital building was designed as a laboratory to examine the effects of unit configurations while minimizing other differences in the physical environment (for example, standard size of patient rooms, standardization of nursing station layout) and operation.

### Methods

In this quasi-experimental study, work sampling observation and questionnaire survey were conducted on 590 different staff members in a total of 12 units in three unit configurations (four radial units, four single-corridor units, and four double-corridor units). The work sampling observation (total over 77,000 observations) was conducted by 12 observers who made rounding of the facility at specific time points and recorded activities of all staff members on the units. A total of 28 types of staff activities were recorded and classified into 9 categories (e.g. direct patient care, indirect patient care, nonproductive time). A total of 24 types of staff locations were recorded and classified into 5 categories (e.g. nurse station, patient room). To measure subjective feelings of staff, a survey questionnaire was developed based on existing research and distributed to staff before and after every shift. The



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questionnaire included items measuring tension, anxiety, psychosomatic disturbances, fatigue, and perceptions of work efficiency and work load. The work sampling data for all staff in one unit for three consecutive days were pooled to calculate proportions of activity and location categories, which together with other two proportions (i.e. with patient, total traveling) were entered as dependent variables in statistical analysis. To control potential confounding factors, a total of 41 variables related to patient, staff, hospital and unit characteristics (e.g. a patient control index indicating the level of nursing need, patient census, and staff age) were collected and entered into statistical analysis. Adjusted and unadjusted mean proportions of activities and locations were ranked between units with “one” assigned to the most desirable. Additional questionnaires were conducted to examine the preference and perception of staff and patients.

## Findings

Comparisons on proportions and ranks of staff activities and locations between the three types of unit showed that the radial design was the best and the double-corridor design was the next best. Staff in radial unit spent significantly more time with patients and less time in travel than staff in single- and double-corridor units. Staff in radial units tended to stay more often in the nurse station and to have nonproductive time in day and night shifts, which might be translated to the ability of taking care more patients. Most nursing staff preferred to work in radial units and thought the radial design improved the quality of patient care.

## Limitations

There were several limitations of this study:

- The units' differences in the physical environment aspects not including unit configuration were minimized (e.g. similar room size, number of beds, and other features) only to the extent allowed by functional needs. Other differences in physical environment did exist between units. For example, the units were designed for different service lines and there were more patient rooms and higher percentages of single rooms in single-corridor units than double-corridor units and radial units. Therefore, the differences in outcomes might be partially attributed to these environmental differences.
- The article did not mention whether inter-observer reliability was calculated or whether each of 12 observers conducted same or similar amount of observation at each unit. It was possible that differences among the 12 observers might have biased the results.
- The results may only be applied to nursing units of similar size and types at similar hospitals.