SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

To determine whether or not the vertical split-flow model improves emergency department efficiency and overall patient satisfaction.

The effect of vertical split-flow patient management on emergency department throughput and efficiency

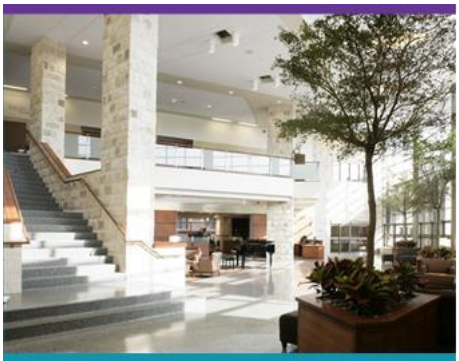
Garrett, J. S., Berry, C., Wong, H., Qin, H., Kline, J. A. 2018 / *The American Journal of Emergency Medicine, Volume 36, Issue 9, Pages 1581-1584*

Key Concepts/Context

In some emergency departments (EDs), the severity of a patient's condition is rated on a 5-point scale during admission using the Emergency Service Index (ESI). Under the "split-flow" model of patient triaging, patients with less-severe conditions (rated an ESI 4 or 5) are "fast tracked" so that they can be separated from patients with higher ESI scores, allowing for more efficient resource allocation for all patient treatment procedures. However, this model relies heavily on the immediate availability of hospital beds, and may contribute to overcrowding and other operational issues. The authors of this study suggest that a "vertical split-flow" model could lead to more efficient workflows for treating ESI 4 or 5 patients by restructuring the patient triage process. Rather than immediately assigning ESI 4 or 5 patients to physical beds, they are assigned "virtual beds", or beds that they will be placed in after initial healthcare provider assessments, lab tests, and necessary immediate treatments are already completed in sub-waiting or treatment spaces.

Methods

This study took place over two years in a 74-bed ED that served as an educational site and training center for hospital staff and emergency care providers. Pediatric patients, as well as patients receiving treatments for severe burns or psychiatric conditions, were excluded from this study. Patient and ED operational data were collected for 12 months, both before and after the introduction of the vertical split-flow model. A total of 222,050 patient visits were analyzed (107,217 during pre-intervention, and 114,833 during post-intervention). The authors used ED patient length of stay (LOS) as the primary outcome. Differences in arrival to provider time, percentage of patients who left without receiving any treatment or complete



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treatment, patient satisfaction scores, and disposition to departure were used as secondary outcomes.

Findings

Implementation of the vertical split-flow model resulted in improved ED efficiency measures across the board, even after statistical adjustments for differences in patient age, acuity, and admission rates were made. Overall ED patient LOS was reduced by 17 minutes for an average of 90 patient care hours per day. These improvements were observed without increasing the number of staff working in the ED and without any decrease in patient satisfaction scores. An increase in door-to-provider time was observed (from 34 to 36 minutes). These results validate the authors' hypothesis that the vertical split-flow model would result in more efficient ED operation overall.

Limitations

The authors noted that this study was conducted using administrative data only, which may have resulted in unmeasured confounders and a lack of randomization. No disaster activations occurred during the study period, which prevented the study of how the vertical split-flow model might work under extenuating circumstances with high-volume patient influxes. The authors did not observe the vertical split-flow model under conditions with additional ED staff on the floor. Lastly, since this study took place in a single location, the results may not be generalized to EDs in all locations.

Design Implications

This study suggests that the vertical split-flow model could help EDs provide more efficient care without requiring a larger amount of space or additional hospital beds. Patient privacy concerns that might emerge under this model could be mitigated through the presence of a private examination room used for initial triaging procedures. Designers could work with healthcare staff to best understand how bed placement and ED spatial designs might be optimized for use of the vertical split-flow model..