



KEY POINT SUMMARY

OBJECTIVES

The authors highlight specific ED features from current literature and compare layouts of both free-standing and hospital-based EDs from within the United States and abroad.

Analysis of functional layout in emergency departments (ED). Shedding light on the free standing emergency department (FSED) model

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Key Concepts/Context

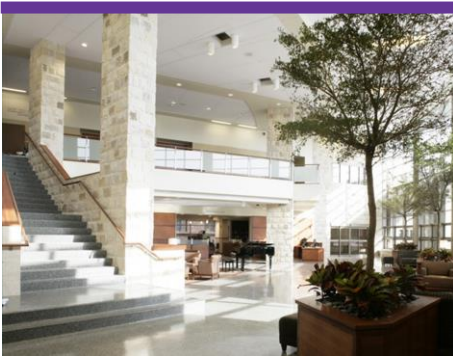
Research shows that emergency departments (EDs) are facing overcrowding, increasing patient acuity, and short staffing, which all are impacting wait times to be seen and patient satisfaction scores. While the root causes of these issues are multifaceted, models of care delivery and the design of both hospital-based and free-standing EDs have recently been scrutinized for efficiency and optimization opportunities.

Methods

A review of scientific literature was conducted to understand key design feature differences and similarities between two ED models (free-standing and hospital-based). The databases used to identify peer-reviewed literature included: Medline, CINAHL, Scopus, PubMed, and Web of Science. Key words used during the searches included: 'Emergency Department,' 'models of care,' 'triage,' 'dedicated health facility,' 'free standing Emergency Department,' and 'FSED.' Additional criteria included date of publication, focus on hospital design, and emphasis on physical elements of design. The study excluded studies focused on organizational or managerial aspects of clinical management within certain ED models, and articles specific to a certain region or geographic area that could not be generalized to other hospital-based or free-standing ED facilities. Studies addressing ED diagnostic or treatment-related areas were accepted as part of the review, but EDs that were temporary or specific to COVID-19 were excluded.

Findings

The initial search resulted in 1174 articles, and after full-text screening, a total of 23 papers have been included in the literature review.



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- **Organizational Models:** Five articles described organizational system of the ED, which included the interconnectivity of the components necessary for the facility to function. The volume of patients was a common component that determined the efficiency of the organization of a model, whether free-standing or hospital-based (e.g., hundreds of patient visits daily for hospital-based versus a couple dozen daily for free-standing). Triage management differed depending on the decentralization or centralization of services and labor (personnel).
- **The Functional Layout:** Hospital-based EDs tended to have basic design elements in a one-way throughput, beginning with triage and moving to the treatment areas. Some hospitals varied in layout by having zoned areas (e.g., operating suite, observation, intensive care). Free-standing EDs do not have overnight beds and do not receive trauma-level verification by oversight professional organizations, due to the lack of resources required for intensive care.
- **Structural and Technical Features:** The category included safety-related systems and technical infrastructure, with considerations such as heating and ventilation systems and how the building would be evacuated.
- **Design Features and Amenities:** Hospital-based EDs have a reputation for long wait times and overcrowding of waiting rooms, while free-standing EDs are focused on more expeditious movement of patients through the care experience. Free-standing EDs also have more amenities, such as retail-like décor and furniture and coffee/refreshment areas; hospital-based EDs have a more sterile or clinical feel to the environment, in comparison.

Limitations

This study included 23 papers, but a limited number of cases not representative of the totality of free-standing or hospital-based emergency departments worldwide. While the authors evaluated each case study according to multiple design domains (e.g., floor plan, functional area), the small sample reflecting 12 facilities primarily from high-volume areas such as Texas (US) and Italy (Europe) limits generalizability. A methodological limitation is the wide span of accepted publication years (January 2000 to December 2021) without allowance for how the domains within the framework may have evolved over time.



Design Implications

This study highlights key features of emergency department models in the US and abroad and provides an overview of the current state of emergency department design and associated organizational considerations. Specifically, this study provides a summary of design differences in free-standing EDs across various contexts within the United States including efficient throughput models; upscale, retail locations; fashionable décor; Wi-Fi; cable television in exam rooms; coffee and refreshment bars; and themed pediatric rooms and dedicated play areas.

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