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Key Information

As ED visits continue to rise in the U.S.^{2, 12} and the Centers for Medicare and Medicaid Services (CMS) launches value-based purchasing based on ED throughput,¹³ the issue of reducing boarding times increases in relevance.

Boarding reduction is optimized in organizations that approach the issue from both macro and micro viewpoints, and engage in shaping demand concepts by decreasing over-utilization while partnering outside of the hospital with primary care, specialty practices, mental health services, community-based care settings, and skilled nursing facilities (SNFs).⁴

Innovation is key to improving patient throughput and minimizing boarding of patients in the ED. Acute care facilities should consider targeting areas that will facilitate a better flow, maintain patient safety and proper care plans, and minimize any unnecessary strain on patients and their families.

The available literature on boarding and patient outcomes supports the benefits of moving admitted ED patients to inpatient services as quickly and efficiently as possible.²⁴ Hospital administrators can maximize efficiency of patient flow by establishing and supporting collaboration among all patient care teams that interface with ED throughput processes.

System-Wide

Strategies to Reduce Emergency Department Boarding

Purpose

It has been demonstrated for over two decades that emergency department (ED) crowding and boarding of patients creates ED operational inefficiencies¹ which impact patient quality of care through delayed antibiotic therapy for community-acquired pneumonia, poor pain management, increased medical errors, and increased in-hospital mortality.¹ Further, data demonstrate that patient satisfaction declines while left-without-being-seen rates and prehospital-diversion rates increase.¹ These issues compromise the ability of ED care providers to offer safe practice and safe care.

Given that overall ED visits in the U.S. continue to increase, thereby stressing already limited resources, it is imperative that creative strategies be identified and implemented to eliminate throughput bottlenecks.² One of the primary bottlenecks, ED boarding, has been increasingly studied, and different evidence-based practices have been implemented with varying degrees of success. This topic brief will review many of these practices and highlight both innovative and evidence-based strategies that can be executed through performance improvement processes, based on the different needs and issues of each acute care facility.

Overview

The impact of boarding on ED productivity, quality of patient care, patient safety, and hospital finances is well documented in the literature. Despite decades of efforts to reduce ED boarding, isolated success stories,³⁻⁵ and financial incentives from the Centers for Medicare and Medicaid Services (CMS) for hospitals to improve ED patient throughput, boarding continues to be a problem for the health system.^{3, 7-10}

In 2014, key stakeholders in emergency nursing, emergency medicine, and CMS came to consensus on ED performance measures and operational definitions to be used to define and measure ED outcomes.¹¹ Boarding is one of the key metrics and is defined as “the process of holding an admitted patient in the ED while waiting for an inpatient bed. This boarding time-interval is measured as the time between the admit decision and departure time stamps.”¹¹

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While many organizations have worked to improve their response to ED boarding, the efforts are often undertaken in silos. Boarding reduction is optimized in organizations that approach the issue from both macro and micro viewpoints, and engage in shaping demand concepts by decreasing over-utilization while partnering with primary care, specialty practices, mental health services, community-based care settings, and skilled nursing facilities (SNFs).⁴ Collaborative management of daily real time inpatient capacity, with demand strategies for medical and surgical services, is also crucial.⁴

As ED visits continue to rise in the US^{2, 12} and CMS launches value-based purchasing based on ED throughput,¹³ the issue of reducing boarding times increases in relevance.

Regulatory Objectives

In the past 20 years, ED crowding has been a topic of conversation, and one of the identified barriers to be overcome is holding inpatients in the ED — commonly referred to as boarding.¹⁴ ED crowding is associated with an increase in error rates, increase in patient mortality rates, increase of length of stay and increased costs per admission.^{10, 14, 24} Several strategies have been implemented to ameliorate ED crowding and inpatient boarding.

One of the first attempts by a regulatory body to establish a standard for length of stay (LOS) for ED boarders was made by the Joint Commission (TJC). In 2013, TJC released its perspective on a target for ED boarder LOS, with the goal being set at four hours.¹⁵ TJC's intent was not to establish an expectation but to provide a guideline as it recognized that factors which impact acute care facility crowding might be outside of the facility's control.

The Centers for Medicare and Medicaid Services (CMS), as part of the values-based purchasing initiative, went a step further and defined quality measure expectations for acute care facilities.¹³ These quality measures are directly tied to financial reimbursement. As acute care facilities meet or exceed these quality measures, they are eligible for enhanced financial reimbursement.

Two of the quality measures CMS set forth in fiscal year 2014 were measurements of ED and hospital throughput.¹³ One of the measures, ED 1B, measures from the time of patient arrival to the ED to patient departure from the ED for admission.¹³ This measure is primarily composed of ED throughput and efficiencies around the initial patient intake, including all associated treatments, assessments, and interventions necessary to stabilize and prepare patients for admission to the acute care facility.

The second measure, ED 2B, measures from the time of the admit decision to patient transfer out of the ED and into an inpatient unit.¹³ This measure mostly represents acute care facility throughput and efficiencies. If the acute care facility itself is overcrowded and unable to accept patient admissions, then patients remain in the ED where they are at high risk for increased morbidity and mortality.¹⁰ It is important to note that hospital-wide processes that determine the 2B measure data impact the 1B ED measure data, which highlights the need for system-wide collaboration in addressing throughput efficiencies.

In an effort to standardize the collection of ED performance measures outlined by CMS, a summit of ED leaders and others representing various healthcare agencies was held in 2014 to further define and update ED time stamps and operational definitions.¹¹ Establishing agreed-upon standardized definitions of ED performance measures allows for consistent comparison of acute care facilities and better identification of benchmarks and best practices. It also facilitates improved reliability of ED operations to achieve the CMS quality measures of ED 1B and ED 2B.

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Innovative Strategies

Innovation is key to improving patient throughput and minimizing boarding in the ED. Acute care facilities should consider targeting areas that will facilitate a better flow, maintain patient safety and proper care plans, and minimize any unnecessary strain on patients and their families. For any plan to be successful, it is first necessary to have the support of senior administration within the organization.¹⁶ This level of support ensures the organization is committed to patient flow and preventing the boarding of patients in the ED. Several strategies have been identified as having a positive impact on flow: capacity management plans, expedited flow for critically ill patients, “smoothing” of the operating room schedule, and early inpatient discharge time.

Proactive surge- or capacity-management plans can assist in handling high volume within the organization. Often these plans outline specific criteria that determine the surge, identify the level of surge, and outline actions to support the management of the surge. Some plans are color-coded for ease of use. The plans are designed to be proactive and to spread the surge impact across the system. These plans can be electronic, such as the National Emergency Department Overcrowding Scale (NEDOCS), which factors in total ED patients, total ED beds, total number of admits, total number of inpatient beds, number of ventilated patients, longest boarding time for an admit in the ED, and longest wait time for a patient in the ED.^{17, 18}

Expediting the movement of critically ill patients out of the ED improves flow and patient care.¹⁹ Some organizations have developed a multidisciplinary team to initiate care for the patient in the ED without delaying admission to the intensive care unit. With this approach, the patient receives more timely therapy resulting in a reduced ED LOS.¹⁹

“Smoothing” the operating room schedule makes admission needs more predictable and prevents a logjam of patients on any particular day.²⁰ This requires an organization’s commitment to managing the operating room time and working with the surgeons to manage and “smooth” the schedule as necessary, requiring a high level of engagement from all groups.

Discharges earlier in the day have reduced boarding and wait times in the ED by creating capacity to accommodate admissions, resulting in less wait time.^{20, 21-23} Often, processes are designed to plan for a discharge the day before it is to occur, which also increases patient and family satisfaction, as they are able to plan accordingly.

See **Table 1** below for additional information on these and other innovative strategies.

Keys to Success

Suggested keys to success with reducing ED boarding are many and can be tailored to the needs of the individual organization. Priority should be given to plans that either support patients boarding in the ED or that expedite patient movement so that the nursing care given is appropriate for inpatients, which is vastly different from ED focused-assessment care.

A study by Singer, et al.²⁴ reinforces previous studies finding that the patient population boarding in the ED has a longer LOS and higher morbidity and mortality, which does not align with safe practice and safe care. In this study,

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the authors discuss prolonged ED boarding and its association with compromised patient outcomes such as increased hospital LOS and mortality. Their findings are similar to those of recent studies reviewed that demonstrate the negative patient effects associated with ED boarding. The authors describe several potential explanations:

The first is that there is a direct causal relationship between boarding and patient outcomes. This may be due to the fact that boarders contribute to ED crowding, placing an increased burden on ED personnel (particularly nursing staff) who are often busy seeing new and potentially more unstable patients, while dedicating less time to caring for those patients who are already admitted and boarded. Also, although physician care is provided by the inpatient services, the ED boarders may be the last patients to be seen by the services caring for these patients and may be less frequently re-evaluated. Workups and other therapeutic interventions may be delayed as well.²⁴

The available literature on boarding and patient outcomes supports the benefits of moving admitted ED patients to inpatient services as quickly and efficiently as possible.²⁴ Hospital administrators can maximize efficiency of patient flow by establishing and supporting collaboration among all patient care teams that interface with ED throughput processes. One strategy to support this concept, inpatient hallway boarding, involves moving admitted patients from the ED to inpatient hallways until inpatient beds become available to improve ED capacity. Patients who are boarded on inpatient hallways are typically a limited subset that excludes those needing a higher level of care (e.g., intermediate or ICU). The decision to board in inpatient hallways may be prompted by considerations of time—where ED LOS exceeds a set threshold; or volume—where excessive numbers of ED boarders are present. While this strategy has been implemented in multiple settings, it is important to note that some local, state, and/or hospital requirements may prohibit its use.^{14, 24}

The table below summarizes a variety of the most recently published initiatives that have demonstrated improvement in various practice settings. Organizations might consider implementing and evaluating one or several of these strategies as deemed appropriate to address the issues of patient crowding and boarding from a system-wide perspective. A few tactics for each strategy are listed; additional tactics can be found in the references noted.

Table 1: System-Wide Innovative Strategies to Consider for Implementation

Innovative Strategy	Tactics	Highlights/Comments
Develop a patient progress team across all disciplines to collaborate on ED throughput and monitor specific quality data measures ¹	Utilize checklists that support flow at your organization to help keep the work on track Develop policies to support processes implemented	Monitor outcomes and create systems to report barriers to senior leaders for resolution and improved flow via a systematic process

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<p>Smooth the OR schedule for elective procedures²⁵</p> <p>Elective surgery times should be matched to available inpatient beds by smoothing the schedule to include all days of the week and to schedule more intensive procedures throughout the week^{4,20}</p>	<p>Three-phase process: (1) separate streams of scheduled and unscheduled surgeries into separate, dedicated operating rooms; (2) smooth elective inpatient surgeries to roughly the same number for every preferred placement unit daily; and (3) calculate the number of needed in-patient beds.²⁵</p>	<p>Improving patient flow through the ED with a leveled OR schedule should create more even bed availability across days of the week and on weekends</p>
<p>Implement improved bed management/utilization¹</p>	<p>Enlist support from the bed management team to create priority systems such as color-coded zones for proactive and reactive needs based on flow Create policy to support this work Enlist senior nursing leaders to champion the efforts Establish observation units with clearly identified care paths designed to minimize LOS²⁶</p>	<p>Coordinated effort by a small cohort of experts with emphasis on accountability</p> <p>ED-to-inpatient bed metrics should be monitored for quality assurance</p>
<p>Create transparency across the organization regarding ED throughput and the effects on patient outcomes²⁶</p>	<p>Publish metrics by unit for ED throughput times Educate staff on mortality statistics for boarded patients in the ED Enlist the support of senior leadership to champion the efforts</p>	<p>Staff awareness regarding the importance of ED throughput and how they can individually affect this in their work related to discharges Use of inpatient discharge lounges Pulling patients to the inpatient unit from the ED proper</p>
<p>Use of inpatient hallways for boarding^{14, 24}</p>	<p>Consider use of hallway spaces on inpatient units for patients to board instead of ED hallways Incorporate hallway status into your bed management/surge policy</p>	<p>Mitigate patient safety issues (e.g., provide call lights in hallways) Monitor outcomes as identified by your patient progress teams</p>

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<p>Use of National (or Community) Emergency Department Overcrowding Scales (NEDOCS/CEDOCS): Communication tools that alert the facility of the early warning signs of crowding that would lead to boarding. Ideally, they are supported by formalized hospital-wide action plans that are initiated based on scoring of NEDOCS/CEDOCS¹⁸</p>	<p>Use key operational variables to calculate NEDOCS/CEDOCS</p>	<p>Standardized early warning system that launches a pre-established plan at the unit level that expedites inpatient, ED, and OR care, leading to reduced bed demand</p> <p>The full scoring tool can be found in the <i>Resources</i> section</p>
<p>Shape or reduce demand⁴</p>	<p>Create partnerships with SNFs and nursing homes, ED alternatives (e.g., family practice and urgent care clinics) Increase use of evidence-based clinical pathways Improve collaboration with care management (e.g., timely consults and evaluations to reduce LOS) Reduce complications/harm and readmissions of at-risk populations via aggressive proactive care and care management Use telemedicine to expedite emergency care</p>	<p>Reduce demand for beds by redirecting patients to more appropriate resources Reduce LOS by operationalizing efficiencies in care</p>

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<p>Match capacity (availability of inpatient resources) to demand of those resources^{4, 27}</p>	<p>Framework that allows for bimodal communication between senior administration and front-line nurses, specifically to address capacity and demand limitations</p> <p>Assess hourly, daily, and seasonal variations and plan accordingly with resources/beds/staffing</p> <p>Unit huddles: Charge nurse, front-line nurses, case management meeting to classify patients based on discharge targets and gaps, with goal to establish demand needed at least an hour prior to peak census</p> <p>Implement high-census protocols to expedite admissions from ED and manage surgical schedules</p>	<p>Ensure that resource needs are met by anticipating and planning for predictable surges</p>
<p>Timely inpatient discharges^{20, 26}</p>	<p>Send email reminders to attending physicians the day before to discharge patients by 11:00 am the following day (patients identified by hospital leaders)</p> <p>As patients are identified the day before discharge, notify other team members to prepare for transport, notify family, get prescriptions ready, etc.</p>	<p>Allows for open, available inpatient beds to be ready for the peak influx of ED admissions</p>
<p>Facility-wide bed management and meetings^{26, 27}</p>	<p>Understand needs of each nursing unit</p> <p>Create picture of real-time hospital bed management in a given timeframe</p> <p>Create system-level countermeasures for demand/capacity restraints</p> <p>Draft communication of current day's demand/capacity picture</p>	



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Conclusion

ED boarding is a complex issue that extends beyond the walls of the ED. Identification of an interdisciplinary team combined with strong leadership support can facilitate implementation of one or several of the evidence-based practices to facilitate smooth, efficient patient flow out of the ED and into the acute care facility. Ultimately, progress in addressing ED boarding can decrease patient-care delays and complications, decrease patient morbidity and mortality, and assure our patients and the public of our commitment to safe practice and safe care.

Resources

[Emergency Department Crowding: High-Impact Solutions](#)

[Improving Patient Flow and Reducing Emergency Department Crowding: A Guide for Hospitals](#)

[NEDOCS Score for Emergency Department Overcrowding](#)

[CEDOCS Score for Emergency Department Overcrowding](#)

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Definitions of Terms

Boarding: The process of holding an admitted patient in the ED while waiting for an inpatient bed; an interval measured as the time between the admit decision and departure time stamps.¹¹

ED Crowding: When institutional resources available are insufficient to meet the basic service needs of emergency patients, impacting timely patient care.¹

NEDOCS/CEDOCS: National (or Community) Emergency Department Overcrowding Scale. A calculation tool used to provide severity estimates of ED overcrowding in large, academic trauma centers or in community EDs.¹⁸

Pulling: A strategy where a receiving unit “pulls” admitted patients from the ED in a timely fashion to prevent or address ED crowding and boarding.²⁶

Smoothing: A strategy where surgical and hospital leadership review and mitigate the surgical schedule to help improve ED throughput.^{4, 20, 25}

Surge: A sudden influx in patient capacity that overwhelms department and/or hospital resources.

Throughput (Patient Flow): A hospital-wide process by which patients flow through services, from entry into the hospital system through final disposition.

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