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SOLVING ED BOARDING BOTTLENECKS

NAYEF M ALKHAMMASH
Patient Care Technician at King Salman Specialized Hospital.

Abstract

Emergency Department (ED) boarding—the practice of holding admitted patients in the emergency department after a decision to admit has been made due to a lack of available inpatient beds—represents one of the most critical threats to healthcare quality, patient safety, and operational efficiency globally. Far from being an isolated "emergency room problem," ED boarding is an indicator of systemic hospital-wide and health system operational congestion. This article synthesizes current research and operational frameworks to examine the root causes, adverse consequences, and evidence-based solutions for mitigating ED boarding bottlenecks. By analyzing input, throughput, and output interventions—including early discharge protocols, real-time bed tracking, command center implementations, and post-acute transitions—we outline an integrated, multi-systemic framework to resolve ED boarding and optimize hospital flow.

INTRODUCTION: DEFINING THE EMERGENCY DEPARTMENT BOARDING CRISIS

Emergency Department boarding occurs when patients who have been evaluated, treated, and formally admitted to the hospital remain in emergency department care spaces because no inpatient bed is available. Over the past two decades, boarding has evolved from an occasional peak-volume occurrence into a chronic, daily crisis across hospital networks nationwide.

The consequences of ED boarding are pervasive and severe:

- **Decreased Patient Safety and Clinical Outcomes:** Boarding is directly linked to increased inpatient mortality, delayed administration of critical medications (such as time-sensitive antibiotics or analgesics), increased medical errors, and prolonged hospital overall lengths of stay (LOS).
- **Operational Inefficiencies:** When ED beds and hallway spaces are occupied by admitted patients requiring inpatient-level nursing care, the emergency staff's capacity to assess and stabilize newly arriving emergent patients is severely compromised, leading to higher rates of left-without-being-seen (LWBS) patients and ambulance diversion.
- **Provider Burnout:** Managing dual patient populations—acutely ill unscheduled emergency arrivals alongside complex boarded inpatients—creates intense operational friction, accelerating burnout and turnover among emergency physicians and nurses.

To address ED boarding effectively, health systems must move beyond localized ED interventions and address the structural bottlenecks across the entire hospital workflow.

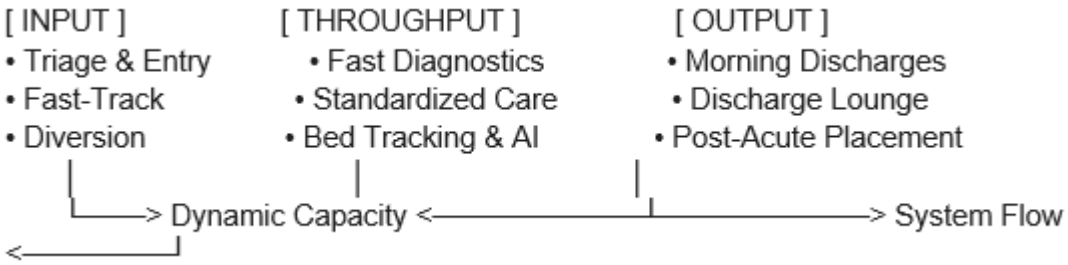
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Etiology and Systems Framework: Input, Throughput, and Output

A widely recognized operational framework classifies hospital flow into three distinct phases: **Input**, **Throughput**, and **Output**.

Hospital Flow Framework

Operational Stage	Core Objective	Key Interventions & Strategies
1. INPUT (Patient Arrival & ED Access)	Efficiently manage incoming patient demand and divert non-emergent traffic.	• Triage & Rapid Assessment • Fast-Track Clinics for low-acuity cases • Direct-to-Chair/Bed Intake Models • Primary Care & Diversion Alternatives
2. THROUGHPUT (Internal Processing & Inpatient Care)	Accelerate diagnostic workflows and optimize acute care delivery.	• Rapid-Turnaround Diagnostic Testing • Standardized Clinical Pathways & Order Sets • Real-Time Bed Tracking & RTLS Systems • Predictive AI for Capacity Management
3. OUTPUT (Inpatient Discharge & Care Transitions)	Eliminate downstream exit blockages to generate available inpatient beds.	• "Discharge by Noon" / Early Morning Discharge Protocols • Nurse-Staffed Dedicated Discharge Lounges • Centralized Capacity Command Centers • Post-Acute Alignment (SNFs & Hospital-at-Home)



While input factors (such as surge in community acuity or lack of primary care access) contribute to overall ED volume, empirical evidence demonstrates that **output bottlenecks**—specifically inpatient bed availability and discharge delays—are the primary drivers of ED boarding.

Primary Drivers of Output Bottlenecks

1. **Mismatched Discharge Timing:** Inpatient discharges often peak late in the afternoon or evening, whereas ED admission requests peak in the late morning and early afternoon. This temporal mismatch creates a prolonged capacity deficit during critical operational hours.
2. **Inpatient Bed Turnover Delays:** Delays in Environmental Services (EVS) turnaround, manual bed reporting, and inefficient nurse-to-nurse handoff communication slow down bed occupancy transitions.

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3. **Surgical and Elective Scheduling Spikes:** Uncoordinated scheduling of elective surgical admissions competes directly with emergency admissions for surgical and telemetry beds.
4. **Post-Acute Care Placement Barriers:** Patients requiring Skilled Nursing Facility (SNF) placement, long-term acute care, or specialized home care often experience multi-day discharge delays due to administrative, insurance, or bed availability constraints.

Evidence-Based Strategies to Solve Boarding Bottlenecks

Mitigating ED boarding requires synchronized initiatives across multiple operational domains.

1. Inpatient Capacity Management and Early Discharge Protocols

To align inpatient bed creation with peak ED admission demand, health systems must restructure daily discharge workflows:

- **"Discharge by Noon" / Early Morning Discharge:** Setting target metrics for early morning discharges frees up inpatient capacity early in the operating day.
- **Discharge Lounge Utilization:** Transitioning medically cleared patients waiting for transportation or prescriptions to a dedicated, nurse-staffed discharge lounge frees up acute inpatient beds hours earlier.
- **Multi-Disciplinary Morning Huddles:** Implementing structured daily multidisciplinary rounds (attending physicians, nursing, case management, and pharmacy) by 08:00 helps identify and resolve barriers to discharge 24–48 hours in advance.

2. Operationalizing Full Capacity Protocols (FCP)

When ED boarding reaches critical thresholds, health systems should activate a standardized **Full Capacity Protocol (FCP)**. Rather than storing all boarded patients in the emergency department, FCP distributes boarding across inpatient units (e.g., placing one boarded patient in the hallway of each inpatient unit). Research demonstrates that transferring admitted patients to inpatient hallways improves patient safety, reduces ED overcrowding, and incentivizes inpatient teams to expedite pending discharges.

3. Centralized Operations and Real-Time Digital Tools

Modern health systems increasingly rely on centralized command centers and real-time digital dashboards to drive operational visibility:

- **Capacity Command Centers:** Centralized hubs equipped with predictive analytics monitor health-system-wide bed availability, ED census, EVS turnaround, and incoming transfer requests in real time.
- **AI and Predictive Analytics:** Machine learning algorithms predict daily admission rates, bed demand by specialty, and patient discharge readiness, allowing proactive resource allocation prior to surge events.

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- **Automated Bed Tracking Systems:** Integrating Real-Time Location Systems (RTLS) and electronic health record (EHR) triggers automates EVS dispatch upon patient discharge, reducing bed turnaround time significantly.

4. Smoothing Elective Surgical Admissions

Surgical admissions often create artificial variability in hospital occupancy. By smoothing elective surgery scheduling across the week—rather than clustering procedures on specific days—hospitals stabilize inpatient bed occupancy, ensuring steady availability for emergency admissions.

5. Community and Post-Acute Alignment

Streamlining post-acute transitions reduces length of stay for patients awaiting non-acute care placement:

- Direct communication and preferred partner networks with SNFs to streamline prior authorization and intake assessments.
- Expanding acute care at home (Hospital-at-Home) programs for suitable medical conditions to relieve inpatient bed pressure.

CONCLUSION

Emergency department boarding is a systemic manifestation of hospital-wide operational mismatch rather than an isolated emergency department failure. Resolving boarding bottlenecks demands executive leadership, interdepartmental accountability, and data-driven flow management.

By leveraging predictive analytics, enforcing early discharge protocols, utilizing capacity command centers, and executing full-capacity protocols during surges, healthcare organizations can eliminate boarding bottlenecks, enhance clinical outcomes, and restore dignity and safety to acute patient care.

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