

ENA Executive Synopsis

Emergency Department Productivity: Accounting for Boarded Patients



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Introduction

This executive synopsis provides the rationale and tools for hospitals to keep the calculation of caregiver hours for emergency department (ED) patients separate from caregiver hours for boarded patients. It also provides various accounting methodologies to account for additional labor needed to care for boarded patients. The impact of boarding patients on quality, safety, and patient experience, as well as financial and regulatory implications, is described herein.

Quality and Safety Impact

Rising emergency department volumes and boarding practices increase the risk of fragmented care, while also compromising patient safety and quality of care (Bergs et al., 2016; Boudi et al., 2020; Castner & Suffoletto, 2018; McKenna et al., 2019). Effects of boarding include increased potential for medical errors, delayed or missed orders, and increased ED length of stay (Kennebeck et al., 2011; Lord et al., 2018; McKenna et al., 2019). ED teams are experts in the treatment and care of patients with time-sensitive needs such as trauma, acute myocardial infarction, and sepsis (Boudi et al., 2020; France et al. 2020; Gaiski et al., 2017). Their expertise is not in the ongoing care required for a boarded patient (Boudi et al., 2020). Boarding has been associated with increases in hospital length of stay, adverse events, and mortality (Artenstein et al., 2017; Boudi et al., 2020; McKenna et al., 2019). Boarding of patients in the ED creates bottlenecks in departmental processes, leading to poor quality patient care, decreased efficiencies, and potential for poor outcomes (Artenstein et al., 2017; McKenna et al., 2019).

Patient Experience Impact

Boarding admitted patients in the ED results in a distressing environment for both arriving emergency patients and boarded patients (Artenstein et al., 2017; Berg et al., 2020; Chang et al., 2018). Boarding also influences waiting room delays and increases the risk for more left without being seen (LWBS) patients (Artenstein et al., 2017; Berg et al., 2020; Chang et al., 2018). The delays and increased LWBS rate can have a detrimental effect on patient efficiency and engagement (Han et al., 2016). The boarded patients experience anxiety and uncertainty because of prolonged waiting for the inpatient bed transition (Han et al., 2016; Liu et al., 2015).

The lack of communication, louder noise, and ongoing distractions in the ED setting often lead to a poor patient experience. Recognizing potential loss of reimbursement for poor patient experience is a key factor in assuring emergency leader advocates of the need to segregate the ED and boarded caregiver hours.

Financial Impact

Boarding admitted patients in the emergency department has significant financial implications for hospitals (Augustine, 2016; Haq et al., 2018). Hospitals will experience a loss of revenue through increased left without being seen rates and increased hospital length of stay (Augustine, 2016; Berg et al., 2020; Schreyer & Martin, 2017). In addition, loss of revenue may occur through indirect means related to poor community image, poor relations with private physicians who refer patients to the hospital, decrease staff morale, and increased staff turnover.

Regulatory Impact

The Centers for Medicare and Medicaid Services (CMS) (2017) and The Joint Commission (TJC) (2020) both have quality indicators related to emergency department length of stay for admitted patients:

- ED-1: Median time from ED arrival to ED departure for admitted ED patients.
- ED-2: Admit decision time to ED departure time for admitted patients.

Definition of a “Boarded patient”

There is no universally accepted definition of a boarded patient. The Emergency Nurses Association (ENA), along with the Emergency Department Benchmarking Alliance (EDBA), defines boarding as 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 (Wiler et al., 2015). This definition was acknowledged when emergency nursing, emergency medicine, and CMS came to a consensus decision at an EDBA stakeholders meeting in 2014 (Wiler et al., 2015). TJC, in its revision to Leadership Standard LD. 04.03.11 - Patient Flow Standard, defines boarding as “the practice of holding patients in the emergency room...after the decision to admit or transfer has been made.” TJC recommends that “boarding time frames not exceed 4 hours in the interest of patient safety and quality of care” (TJC, 2012, p. 5). To account for additional labor and the cost involved, accurate and consistently defined measurement of hours of care should be the initial step (Moretz & Chmielewski, 2019).

Communication with Finance Administrators

Using financial principles and data, as well as finance and accounting terminology, will aid in integrating financial knowledge into the clinical area (Dunham-Taylor & Pinczuk, 2014). To be most effective, ED nurse leaders must communicate the impact of boarding on ED productivity to the finance department with cost examples (Kalisch et al., 2011). Whether separating boarding hours into a separate cost center or including them in the emergency department patient care hours, using graphs and “speaking finance” (Muller & Karsten, 2012) will

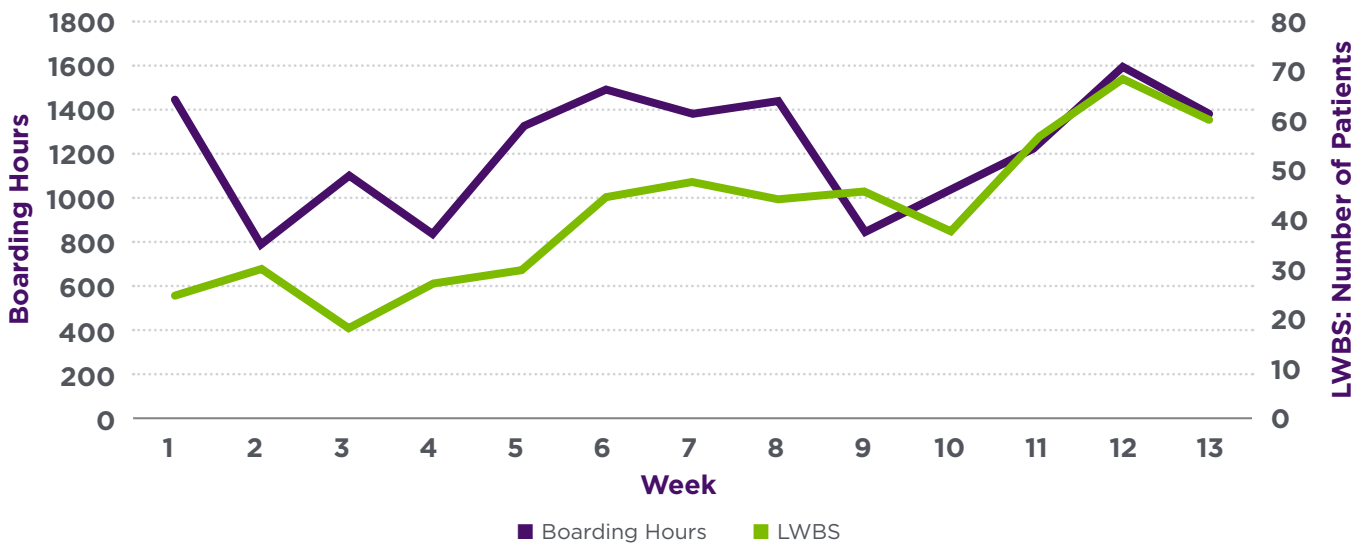
better relay the message of patient care hours needed and the staff required to provide them.

Estimating the lost revenue due to patients who leave without being seen is a strategy emergency department leaders should consider when working with senior hospital leadership to emphasize the impact of emergency department boarding (Artenstein et al., 2017). The hospital’s finance department should be able to provide the average revenue for an emergency department patient who has been treated and released and the average revenue for an emergency department patient who is treated and admitted. If this information is not available, the Medical Expenditure Panel Survey website https://meps.ahrq.gov/mepstrends/hc_use/ estimates the average cost for an emergency department visit with discharge to be \$1,016 and for admission to be \$14,892 (Agency for Healthcare Research and Quality, n.d.).

It is common for there to be a correlation between the number of patients who leave without being treated and the number of boarding hours in the emergency department (EDBA, in press). Emergency leaders intuitively know this. However, when working with senior hospital leadership, it is necessary to demonstrate this correlation through data (see figures 1 and 2).

Figure 1

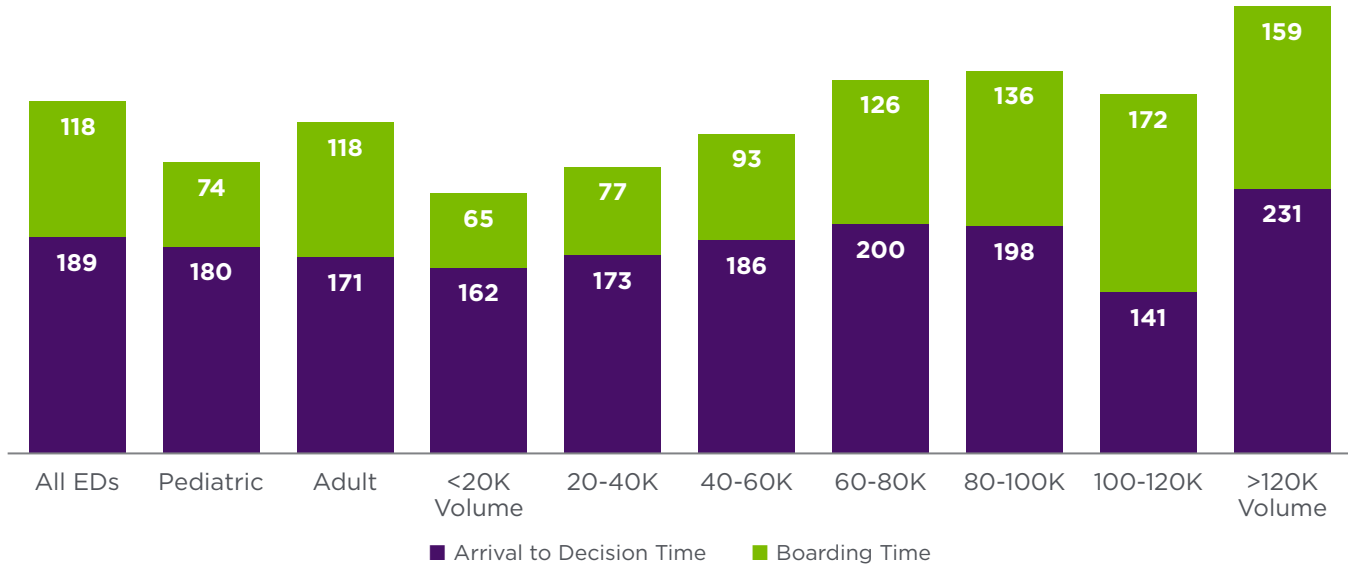
Boarding Time Versus LWBS by Week



No source; simulated data only.

Figure 2

Median LOS for Admitted Patients Arrival to Decision and Decision to Departure (Boarding) per Cohort



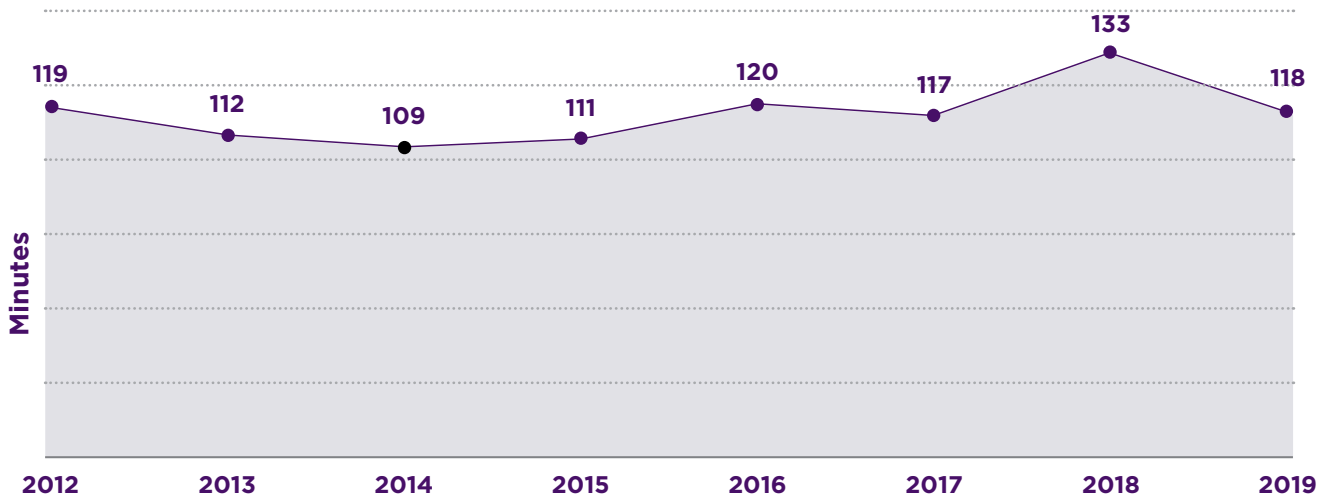
Source: Emergency Department Benchmarking Alliance. (in press). 2019 preliminary report.

Since 2012, ED leaders have had the opportunity to demonstrate reductions in ED boarding by publishing their boarding time on the CMS Hospital Compare website. The graph

in Figure 3 shows very little progress has been made in reducing boarding time in EDs since 2012. It is apparent boarding remains a challenge for the healthcare industry (EDBA, in press).

Figure 3

ED Boarding Time per Year



Source: Emergency Department Benchmarking Alliance. (in press). 2019 preliminary report.

Accounting Methodologies

It is recommended that ED boarding hours be accounted for separately from routine ED care hours. When ED boarding hours are not accounted for separately, it skews ED productivity and causes the ED to appear over budget.

Worked hours per patient visit (wHPPV) is a standard method to measure the labor costs expended per emergency department visit. wHPPV is calculated as the total number of hours worked divided by the total number

of emergency department visits. This method of measuring labor cost does not consider the length of the emergency department visit, patient acuity, nursing intensity, or other visit-specific factors (Wiler et al., 2015).

Several methods can be used to separate ED boarding care hours/visit from the routine ED care hours/visits; which method is used is an institutional or personal decision. In this synopsis four methods are described; for each method the same set of ED data was used as reflected below:

Emergency Department Statistics	
ED Visits	120
Worked hours	230
Target wHPPV	1.8
Admission Numbers	
ICU	2
Telemetry	10
Med/Surg	14
Boarding Hours	
ICU	8
Telemey	4
Med/Surg	55
Inpatient target ratio/wHPPD	
ICU	1:2 nurse to patient ratio or 12 wHPPD
Telemetry	1:4 nurse to patient ratio or 6 wHPPD
Med/Surg	1:6 nurse to patient ratio or 4 wHPPD

The first method, as described by Nancy Hicks-Arsenault, DNP, MBA, RN (personal communication, April 28, 2020), calculates the number of care hours to be transferred from the ED to the receiving unit. This calculation is based on the total boarding hours and the receiving unit’s nurse/patient ratio (see Table 1).

The second method, as described by Barbara Weintraub MSN, MPH, BSN, BA, RN, CEN, CPEN, ACNP-BC, FAEN (personal communication,

May 27, 2020), is similar to the method described by Hicks-Arsenault as it also calculates the number of care hours to be transferred from the ED to the receiving unit. The Weintraub method first converts the boarding hours to patient hours per day, and then, based on the receiving unit’s wHPPD standard, the patient days are converted to worked hours to be transferred to the receiving unit (see Table 2).

Table 1 Hicks-Arsenault Method

Date	Unit Type	Inpatient Nurse/Patient Ratio		Admits Boarded	Total Boarding Hours (B)	Hours Transferred to receiving unit (C)
		Nurse	Patient (A)			
	Med/Surg	1	6	14	55	9.2
	Tele	1	4	10	42	10.5
	ICU	1	2	2	8	4.0

Calculated formula: $C=B/A$

Table 2 Weintraub Method

Date	Unit Type	Inpatient Nurse/Patient Ratio		Admits Boarded	Total Boarding Hours (A)	Hours per Day (B)	Patient Days (C)	Receiving unit wHPPD standard (D)	Worked hours transferred to receiving unit (E)
		Nurse	Patient						
	Med/Surg	1	6	14	55	24.0	2.29	4	9.17
	Tele	1	4	10	42	24.0	1.75	6	10.5
	ICU	1	2	2	8	24.0	0.33	12	4.0

Calculated formula:

STEP 1: $C=A/B$

STEP 2: $E=C*D$

The third and fourth methods described in this paper are presented by Moretz and Chmielewski (2019). The third method is called the “Buffer” method, which they recommend. When using this method, hours or visits are not transferred

to an inpatient cost center; instead, they remain within the ED. However, after calculating the wHPPV used to care for the boarded patients, that wHPPV is added to the ED’s budgeted/ target wHPPV as shown in Table 3.

Table 3 The Buffer Method

Date	Blended Inpatient Nurse/Patient Ratio		Nurse/Patient Ratio (%) (A)	Admits Boarded	Total Boarding Hours (B)	Required Care Hours (C)	
	Nurse	Patient					
	1	4	0.25	26	105	26.3	
Emergency Department Total Census for the Day (D)							120
wHPPV for Boarded Patients (E)							0.22

Calculated formula:

STEP 1: $C=B*A$

STEP 2: $E=C/D$

The fourth method described by Moretz and Chmielewski is referred to as the “Modified Visit” method. In this method the required care hours for boarded patients are converted into additional ED visits. The additional visits

are then added to the total ED census to determine the “modified” ED census. The modified ED census is then used to calculate the ED productivity. Table 4 presents a sample calculation using this method.

Table 4 Modified Visit Method

Date	Blended Inpatient Nurse/Patient Ratio		Nurse/Patient Ratio (%) (A)	Admits Boarded	Total Boarding Hours (B)	Required Care Hours (C)	
	Nurse	Patient					
	1	4	0.25	26	105	26.3	
Emergency Department's Budgeted wHPPV Target (D)							1.8
Modified Additional Visits (E)							14.58
Emergency Department Total Census for the Day (F)							120
Modified Emergency Department Census for the Day (G)							134.58
Total Worked Hours (For ED and Boarded Patients) (H)							230
Modified Actual wHPPV (I)							1.71

Calculation formula:

- STEP 1: $C = B \times A$
- STEP 2: $E = C / D$
- STEP 3: $G = E + F$
- STEP 4: $I = H / G$

In conclusion, EDs have struggled for years with the many issues related to inpatient boarding in their departments. Initially, the struggle was how to manage the care of boarded patients while still caring for the routine ED patients, often with no additional resources. Currently, the struggle is how to best document the need for additional resources. Without accounting for boarded patients, EDs often appear to be working over-budget when boarding patients when in fact they are working under-budget. As stated in the 2017

ENA Position Statement, *Crowding, Boarding, and Patient Throughput*, “Data are key to both understanding and conveying the factors that cause ED crowding and boarding. Measurement using rigorous metrics and communicating these data to all stakeholders is necessary to address clinical process variations and to evaluate process improvement” (2017, p. 2). The methods described in this synopsis will assist ED leaders with identifying needed resources and demonstrating financial realities of boarding inpatients in the ED.

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