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A Bed Management Strategy For Overcrowding In the Emergency Department

Executive Summary

- In 2006, the Institute of Medicine cited growing visit volumes, hospital closures, financial pressures, and operational inefficiencies as the principal reasons for emergency department (ED) overcrowding and called for regulatory measures to resolve the problem.
- A Midwest medical center with 59,000 annual ED visits instituted a bed management strategy to decrease the need to board, or hold, admitted hospital patients in the ED awaiting transfer to an inpatient care unit.
- This strategy was successful in improving the hold time from an average of 216 minutes to 103 minutes, or by 52%.
- This allowed the staff at the hospital to care for an additional 2,936 patients.
- During this same time, the overall hospital mortality decreased by 0.07% and patient satisfaction scores improved 1%.
- The greatest outcome from this intervention was realized in the potential revenue increase of over $2 million.

OVERCROWDING, AS DESCRIBED by Dickinson (1989), has been defined as the condition that exists when the demand for emergency department (ED) services exceeds the available supply or there is an inability to move patients to inpatient areas (Bernstein et al., 2006). According to the Government Accounting Office (GAO, 2009), the single greatest cause of crowding in the ED is the prolonged presence of patients already admitted to the hospital, for whom no inpatient bed is available. These "boarders" or "holds," according to the GAO, consume substantial amounts of resources and labor. These patients also affect ED productivity, for they prevent the staff from treating the next patient, or bringing the next patient to the ED from the waiting area. Thus, boarders, along with ambulance diversion, have been recognized by the Institute of Medicine (IOM, 2006) as an important and unacceptable consequence of ED overcrowding. While occasional overcrowding is to be expected, according to the Centers for Disease Control and Prevention (CDC), the largest increase in the use of the ED occurs in two specific populations: (a) those without health insurance and a complicated health history, the result of not obtaining primary care, and (b) those over 65 years of age who have chronic medical conditions (McCaig & Burt, 2005). The notion that the ED is the front door to the hospital is pervasive (SoRelle, 2002). Thus, the need to address overcrowding in the ED is hypothesized to positively impact the quality and timelessness of the care provided, patient satisfaction, and the productively of the ED staff.

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ures to resolve the problem. The Policy Paper of the American Academy of Emergency Medicine (Bernstein et al., 2006) supports the findings of the IOM and provides an input-output model that results in ED overcrowding. Most recently, Miller and Washington (2010) posited that 50% of hospital emergency departments are at or over capacity. In 2010, the Centers for Medicare and Medicaid Services announced it is considering linking three ED-related measures to service reimbursement. These measures include (a) median time from arrival to departure for patients subsequently admitted to an inpatient setting, (b) median time from the disposition decision to admit to the time of transfer to an inpatient care setting, and (c) median time from arrival to dismissal for patients able to go home from the emergency department. While many reasons have been identified as causing emergency department overcrowding, the aim of this article is to describe the use of a bed management strategy to decrease the need to board, or hold, admitted hospital patients in the ED awaiting transfer to an inpatient care unit.

Setting

The hospital in this article is a 221-bed Trauma II medical center with 59,000 ED visits and 10,000 admissions annually. Although this health care facility is located in a Midwestern suburb, frequent-use populations, as identified by the CDC, are prevalent; resulting in the need to admit approximately 20% of patients initially seen in the ED.

Development of the Strategy

As part of a quality improvement initiative, a bed management strategy was developed based on a retrospective review of patient flow information and times to obtain baseline data. As a result of the findings from the chart review, a multidisciplinary team was formulated to evaluate, develop, and implement intervention(s) aimed at improving patient flow, time to bed placement, and reducing hold hours. The team was co-chaired by the chief nursing officer, the associate chief nursing officer, and the chief financial officer. Other team members were representatives from the ED, inpatient units, environmental services, and case management. The charge of this committee was to evaluate present policies and procedures, recommend changes, and implement the recommendations reported in this article. A 3-month timeframe was set as the goal for implementation of any new policy or procedure. Four subcommittees were formulated, one to address each concern:

1. *Hand-Off Team* members consisted of representatives from inpatient units and the ED. The charge of this team was to assess the present policy and procedures related to faxing versus verbally providing transfer information using the Situation, Background, Assessment Recommendation (SBAR) format (SBAR Institute for Healthcare Improvement, 2011).

2. *Discharge Team* consisted of representatives from case management and the inpatient units. These individuals reviewed the present processes associated with dismissal and developed standardized communication content for the case manager, the unit or department charge nurse, and what should be conveyed during the daily huddle session prior to the bed meeting.

3. *Bed Management Team,* which consisted solely of nursing personnel, reviewed and revised the bed management policy to reflect current procedures. A procedure for routine post-procedure admissions, identifying priority-admission patients, and developing alternative/temporary placement areas was developed and implemented

4. *ED De-Escalation Team* membership consisted of representatives from the ED and the inpatient units. These individuals developed a de-escalation policy for the ED. This policy included mobilizing a team to assist in transporting patients and delivering cleaning equipment necessary to decrease the time required to make a bed available.

Two features were available at the hospital, both useful for implementing this strategy. There was an existing electronic system capable of tracking empty inpatient care unit beds and monitoring the time required to ready an empty bed for another patient. The medical center also had an existing internal transportation system.

The Strategy

Position implementation. A new full-time "bed manager" position was developed. The responsibilities of this position include identifying and assigning empty inpatient beds appropriately within 15 minutes of a request, maintaining communication regarding census status to physicians and administration, and analyzing data for trends. In day-shift position, a registered nurse (RN) who reports to the director of staffing operations, facilitates a daily bed status meeting to determine present census and anticipated dismissals. These responsibilities were incorporated into the job responsibilities of the evening/night/weekend nursing supervisor, thus providing a 24/7/356 bed management program.

The charge nurse for each unit, together with the case manager, reviews the daily census information at the beginning of the day shift. All actual or potential dismissals are identified and a bed availability time is estimated. These data are presented at the

0900 bed management meeting; attendance is required for the bed manager, all unit charge nurses, and the nursing directors. Ancillary department representatives are welcomed, but attendance is not required.

Communication form. A paper communication form was developed to assure consistency with the content covered at each meeting. Content includes noting any beds presently available on any unit, confirming planned dismissals, and identifying potential dismissals. Planned admissions and admissions after scheduled procedures are identified, with temporary bed placements assigned. Three beds available for immediate occupancy are identified each day. This allows for an "assignment of bed" to occur within 15 minutes of an ED professional making an inpatient disposition decision. The planned goal was for these patients to be in the inpatient bed within 45 minutes of that decision.

Training program. An educational program for the staff was developed and provided by members of the multidisciplinary team. This education consisted of reviewing the new policies, stating the rationale for the policy changes, and allowing staff to provide feedback. The education provided to the unit secretaries included the necessity of treating all dismissal orders as STAT orders and for the RNs to process dismissal orders within 60 minutes. Education for the medical staff focused on the need to identify dismissals early in the day, with the goal to have the majority of dismissals occur by 1100. Each educational session included a discussion surrounding the impact this policy would have in minimizing the wait time for beds, enhancing the ability to provide timely and efficient care, as well as the ability to prevent ambulance diversion. Signage was developed and posted in the physician lounge and physician entrance that articulated bed status. Red (critical), yellow (urgent), and green (unencumbered) were used to represent the bed availability at the medical center. The bed management policy and procedures were reviewed and accepted by the medical executive committee and the board of trustees.

Implementation of the Strategy

Once all educational activities were completed, implementation of the policy change occurred. Changes in this policy included: (a) the ability to notify the unit secretary that a discharge occurred by phone, (b) designating the need for housekeeping to clean the bed using a STAT categorical need, and (c) mandating a daily unit-specific "huddle" meeting, in which possible discharges are identified. This information is then transferred to the bed control nurse, who maintains a current unit-specific and overall hospital bed availability list. Ongoing evaluation of the process was included in all activities during the first month. This allowed the management staff to assure the new processes were being followed, and the ability to identify glitches. One glitch, identified early in the implementation process, was that newly vacant beds were not being reported in a timely fashion. This increased the time required to admit the next patient. The policy was modified such that the staff was able to report the bed being vacant by phone upon escorting the discharged patient from the room. Data from this electronic tracking system were used by the environmental services and transportation teams to identify and staff for peak periods of activity.

Data Reporting

The variables monitored for this project at baseline and 12 months after implementation of the strategy were (a) the time from arrival to departure for patients dismissed from the ED, (b) the time from arrival to departure for patients transferred to an inpatient unit after being seen in the ED, (c) the time from decision to transfer to an inpatient unit to departure from the ED to the unit, (d) the left-without-being-seen (LWBS) rate, (e) the percentage of time ambulances were diverted due to the inability to provide care, and (f) the number of hold hours. A hold hour was the term used to describe the time between the disposition decision and implementation of that decision.

Procedures

Study data were obtained from 10,967 patients who received care during 2010. These data included 6 months prior to implementation of the intervention and 6 months after implementation of the intervention. Patient data related to time of arrival, time to disposition decision, and time of transfer to an inpatient bed are routinely entered into the medical record by health care personnel. These data were electronically retrieved through the computerized medical records system. This computerized system identified any hold hour as the time from 60 minutes that a patient has yet to be transferred to an inpatient bed. The medical records of patients with excessive "hold" time, as well as other outlier data are routinely reviewed manually to ensure data reliability.

Results

Based on 12-month data from 2010 of 10,967 patients entered into the electronic system that were obtained after implementation of this strategy, all criteria variables, with the exception of average time from ED arrival to discharge, decreased. Pre and post data of the bed management strategy are displayed in Table 1.

Conclusion

These data reflect an average decrease of 21% for the 10,967 patients admitted to an inpatient area from the ED after a hold of more than 1 hour. The majority of this time decrease (113 minutes)

Table 1.
Strategic-Related Variable Change

	Pre Policy Change	Post Policy Change	Difference
Average time from ED arrival to dismissal	156 minutes	162 minutes	+6 minutes (1%)
Average time from ED arrival to inpatient admission	330 minutes	262 minutes	-68 minutes (21%)
Average time from inpatient admission decision to transfer to an inpatient care unit	216 minutes	103 minutes	-113 minutes (52%)
Average ED LWBS rate	1.8%	1.1%	-0.7%
Average ambulance diversion rate	11.6%	0.3%	-11%
Hold hours*	1,765 hours	679	-1,086 hours (61%)

* Hold hours are defined as all hours retrospective to disposition for any patient in the ED awaiting inpatient transfer greater than 60 minutes.

LWBS = left without being seen

Table 2.
Outcomes from Implementation of the Bed Management Strategy

Outcome	Pre Policy Change	Post Policy Change
Overall risk-adjusted mortality	2.9	2.2 (-0.7%)
Patients receiving care from the ED	56,960	59,896 (+10.5%)
ED revenue	$39,872,000	$41,927,200 (+$2,055,200)

occurred in the wait for an inpatient bed, once the decision to admit was made. Plunkett, Byrne, Breslin, Bennett, and Silke (2011) correlated a decrease in wait time to be transferred to an inpatient to improved mortality outcomes. At this hospital, the overall risk-adjusted mortality decreased from 2.9 in 2009 to 2.2 in 2010. Bernstein and colleagues (2009) determined that improved patient satisfaction also occurred as an outcome of decreasing the wait time for an inpatient bed. Between 2009 and 2010, patient satisfaction scores improved at this hospital by an overall composite score of 1%. Decreasing the wait time also allows the ED to care for another patient. The ability to avoid overcrowding by transferring quicker resulted in a decrease in the LWBS rate by 0.7% and the necessity to divert ambulances by 11%. This intervention has resulted in the ability to increase the number of patients seen in the ED by slightly more than 10%, or 2,936. Specifically, 56,960 patients received care in 2009 and 59,896 patients received care in 2010. Thus, this intervention ultimately improved not only satisfaction with care but increased revenue. The average reimbursement from an ED visit at this hospital in 2009 was $700. Increasing the number of patients seen by 2,936 in 2010 had the potential to increase revenue by an average of $2,055,200. Table 2 displays these outcomes.

This strategy was successful in improving the hold time from an average of 216 minutes to 103 minutes, or by 52%. This allowed the staff at the hospital to care for an additional 2,936 patients. During this same time, the overall hospital mortality decreased by 0.07% and patient satisfaction scores improved 1%. The greatest outcome from this intervention was realized in the potential revenue increase of $2,055,000. Thus, the outcome of this intervention recoups the costs associated with the new bed management position, and increases the overall financial status of the hospital.

Sharing these data with personnel from ancillary departments allowed them to see the results of their intervention and to understand the positive impact of their commitment. The adherence to the present policy by ancillary staff demonstrates their understanding of how their individual role/responsibility affects the ability of the hospital to provide care.

The inclusion of these departments to understanding the problem and their commitment to solving it was imperative to its success. These departments demonstrated support for this initiative by changing staffing resources during peak times of admissions/discharges to accommodate timely placement of patients in inpatient beds. It is recommended that all affected departments be included early in the decision-making process and implementation of the strategy to resolve the issue.

While this intervention positively impacted ED overcrowding while awaiting an inpatient bed, there are other areas that significantly impact ED overcrowding. These include "door to physician," triage processes, the need to

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"immediately bed" a patient, and intradepartmental turnaround times. Further research is needed to identify potential solutions for these concerns. Research exploring physician perception of wait times versus actual wait times would provide data from a different perspective. Identification of other variables which impact the ability to make the admit decision should also be explored. These may include receiving laboratory results, awaiting radiology procedures or interpretations, and/or obtaining consults. Improving the hold time required for transfer to an inpatient bed is one intervention toward improving the care provided in an ED. Identifying, developing, and implementing strategies to improve other barriers is warranted. **$**

REFERENCES

Bernstein, S.L., Aronsky, D., Duseja, R., Epstein, S., Handel, D., Hwang, … Asplin, B.R. (2009). The effect of emergency department crowding on clinically oriented outcomes. *Academy of Emergency Medicine, 16*(1), 1-10.

Bernstein, S.L., Boggs, R., Derlet, R., Handley, N., Hinfey, P., & Kamens, D. (2006). *American Academy of Emergency Medicine (AAEM) Policy Paper: Emergency department crowding: Past, present, and future directions.* Retrieved from http://www.aaem.org/positionstatements/boarding_overcrowding.pdf

Centers for Medicare and Medicaid Services. (2010). *Overview*. Retrieved from http://www.cms.gov/MedicaidDataSources GenInfo

Dickinson, G. (1989). Emergency department overcrowding. *Canadian Medical Association Journal, 140*, 270-271.

Government Accounting Office (GAO). (2009). *Hospital emergency departments: Crowding continues to occur, and some wait longer than recommended time frames*. GAO-09-347. Retrieved from http://www.gao.gov/new.items/d09347.pdf

Institute of Medicine (IOM). (2006). *Hospital-based emergency care: At the breaking point.* Washington, DC: National Academies Press.

McCaig, L.F., & Burt, C.W. (2005). *National hospital ambulatory medical care survey: 2003 emergency department summary*. Advance Data from Vital and Health Statistics, 358. Retrieved from http://www.cdc.gov/nchs/data/ad/ ad358.pdf

Miller, R.K., & Washington, K. (2010). *The 2010 healthcare business market research handbook* (14th ed). Boston, MA: MarketResearch.

Plunkett, P.K., Byrne, D.G., Breslin, T., Bennett, K., & Silke, B. (2011). Increasing wait times predict increasing mortality for emergency medical admissions. *European Journal of Emergency Medicine, 18*(4), 192-196.

SBAR Institute for Healthcare Improvement. (2011). *SBAR technique for communication: A situational briefing model.* Retrieved fromhttp://www.ihi.org/knowledge/Page/Tools/SBAR TechniqueforCommunicationASituationalBriefingModel.aspx

SoRelle, R. (2002). The ED as the hospital's front door. *Emergency Medicine News, 24*(5), 52-54.