The Impact of a Flexible Care Area on Throughput Measures in an Academic Emergency Department

Authors: Jayne McGrath, MS, RN, CEN, CCRN, CNS-BC, Anne LeGare, BSN, RN, CEN, Leigh Hermanson, BSN, RN, CEN, CCRN, and Michael D. Repplinger, MD, MS, Madison, WI

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Introduction: Crowding in emergency departments is a multifaceted problem. We hypothesized that implementing an on-call "Flexible Care Area" (FCA), utilizing multiple front-end throughput solutions, would reduce ED length of stay (LOS).

Methods: This retrospective study evaluates the impact of an FCA on ED throughput at one hospital over a 2-year period (2011–2012). The average arrival-to-room time, arrival-to-physician time, LOS, number of inpatient admissions, and number of discharges during FCA hours were collected, and days with and without FCA functionality were compared.

Results: The FCA was open 165 days in 2011 and 252 days in 2012. The mean daily ED census, as well as the number of ED visits and inpatient admissions during FCA hours, were higher on days with FCA functionality than on days without FCA functionality. Total ED LOS was shorter for Emergency Severity Index (ESI) level 3 patients on days with FCA than on days without it in 2011, but this finding was not repeated in 2012. ESI level 4 patients had shorter LOS on FCA days in both years. The arrival-to-room and arrival-to-physician times showed variable improvement for ESI level 3 and 4 patients over the study period. No statistically significant difference for these measures was found when evaluating ESI levels 2 and 5.

Discussion: Implementing upfront throughput solutions through use of the FCA correlated with reduced ED LOS for all ESI level 3 and 4 patients, not just those who were seen in the FCA.

Emergency departments are overwhelmed with the problem of crowding. The rate at which the public accesses emergency care continues to outpace the available resources, and according to the Institute of Medicine, the situation is considered a national epidemic.[1] Moreover, the number of emergency departments has declined over time, causing an imbalance in supply and demand.[2] Average ED wait times have increased 25% from 2003 to 2009, with longer wait times noted in urban emergency departments when compared with nonurban emergency departments.[3] These crowded conditions and prolonged wait times can jeopardize quality of care and patient safety. In particular, crowding has a negative impact on pain treatment.[4]

This problem has not gone unnoticed; several methods have been proposed to address ED crowding and its downstream effects. One common strategy is the use of a "fast-track" area, where patients with a lower acuity are seen and treated. This concept is not new in emergency care, and authors of numerous articles have reported that fast-track units can successfully reduce ED length of stay (LOS) and ultimately improve ED throughput.[5,6] Other methods focus on front-end solutions such as immediately placing patients in a room, using triage-based protocols, and using physicians/practitioners in triage.[7] One study found that initiation of treatment in a reconfigured waiting room led to decreased LOS and left without being seen (LWBS) rates,

Jayne McGrath is Clinical Nurse Specialist, University of Wisconsin Hospitals and Clinics, Madison, WI.

Anne LeGare is Nurse Clinician, University of Wisconsin Hospitals and Clinics, Madison, WI.

Leigh Hermanson is Nurse Clinician, University of Wisconsin Hospitals and Clinics, Madison, WI.

Michael D. Repplinger is Assistant Professor, Departments of Emergency Medicine and Radiology, University of Wisconsin School of Medicine and Public Health, Madison, WI.

The project described was supported by the Clinical and Translational Science Award program through the National Institutes of Health (NIH) National Center for Advancing Translational Sciences, grant UL1TR000427. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

For correspondence, write: Jayne McGrath, MS, RN, CEN, CCRN, CNS-BC, University of Wisconsin Hospitals & Clinics, 600 Highland Ave, Madison, WI 53792–3280; E-mail: jmcgrath@uwhealth.org.

J Emerg Nurs 2015;41:503-9.
Available online 18 August 2015
0099-1767

http://dx.doi.org/10.1016/j.jen.2015.06.002

TABLE 1
Characteristics of days with and without flexible care area availability

Year(s)	FCA available	Daily patient census [a]	*P* value	No. of ED visits [b]	*P* value	Inpatient admissions [c]	*P* value	Left without being seen [d]	*P* value
2011	+	127.5 ± 1.98	***	56.1 ± 1.3	*	14.5 ± 0.6		1.7 ± 0.3	
	–	119.8 ± 1.8		53.8 ± 1.3		14.9 ± 0.6		1.6 ± 0.2	
2012	+	133.5 ± 1.6	***	58.5 ± 1.1	***	16.7 ± 1.5		2.0 ± 0.3	*
	–	121.3 ± 2.1		55.3 ± 1.5		15.7 ± 0.8		1.5 ± 0.2	
2011-2012	+	131.1 ± 1.3	***	57.6 ± 0.8	***	15.8 ± 0.4	*	1.9 ± 0.2	*
	–	120.3 ± 1.3		54.4 ± 1		15.2 ± 0.5		1.6 ± 0.2	

Values are presented as means (minutes) with 95% confidence intervals.
FCA, Flexible care area.
P values are reported categorically: No asterisk = $P > .05$; *$P < .05$; **$P < .01$; ***$P < .001$.
[a] Daily patient census = daily ED patient census.
[b] No. of ED visits = No. of ED visits during FCA hours.
[c] Inpatient admissions = No. of inpatient admissions from the emergency department during FCA hours.
[d] Left without being seen = No. of patients who left the emergency department per day without being medically evaluated.

as well as decreased patient diversion.[8] Several reports have highlighted successful outcomes in approaches that maximize space and start treatment earlier in the patient's ED visit.[9–11]

Another front-end approach is to keep patients "vertical," which simply means that patients are evaluated and treated without use of a stretcher when one is not required. The underlying philosophy is that vertical patients require less space, can easily move to areas such as radiology, and can sit in a chair for intravenous (IV) therapies or to wait for discharge instructions. Use of the vertical patient model, particularly through a fast-track area, has been implemented at many of the United States academic medical centers that were surveyed in a recent study.[12] Inherent to use of this model is the need to define which patients would qualify for such an approach.

Given our recognition of national trends and anticipation of future needs, an interdisciplinary work group was assembled at our hospital to explore and develop strategies designed to improve ED throughput while incorporating lean process improvement. The discussions from this group resulted in the creation of a space designed to initiate patient evaluation and treatment at the front end of a patient's visit. The area operated on an as-needed basis and was designated the flexible care area (FCA). The FCA consisted of 3 rooms that were staffed by an emergency physician, a nurse, and an ED technician from 4 to 11 PM. It targeted the evaluation and treatment of low- and moderate-acuity patients, all while keeping patients "vertical," as previously described. Unlike typical fast-track areas, the FCA purposefully prioritized the evaluation of patients with moderate acuity in order to expedite the ordering of diagnostic tests. The primary throughput measure targeted was total ED LOS, although ideally other measures such as arrival-to-room time and arrival-to-physician time would also improve by implementing this initiative.

Purpose

The purpose of this study was to evaluate the impact of implementing the FCA on ED throughput measures.

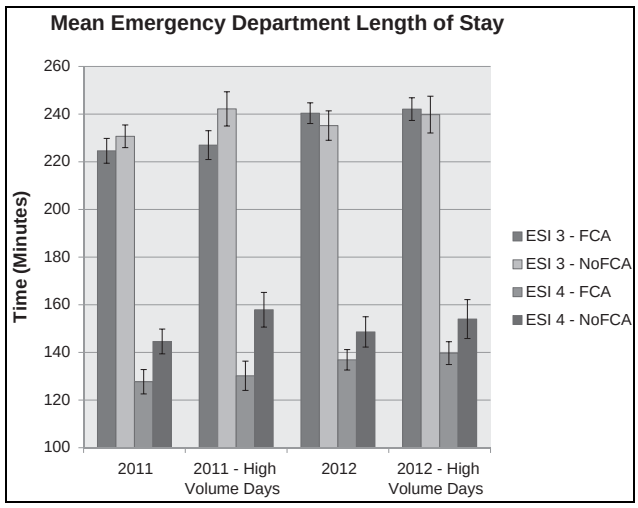

FIGURE
Mean ED length of stay for patients with Emergency Severity Index (ESI) levels 3 and 4, reported as means, with error bars signifying 95% confidence intervals. High volume = >120 visits per day; FCA = flexible care area.