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BRIEF REPORT

The Practice of Emergency Medicine

Does initiating care in alternate care sites decrease time to disposition in the emergency department?

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Abstract

Objectives: During the coronavirus disease 2019 (COVID-19) pandemic surge, alternate care sites (ACS) such as the waiting room or hospital lobby were created amongst hospitals nationwide to help alleviate emergency department (ED) overflow. Despite the end of the pandemic surge, many of these ACS remain functional given the burden of prolonged ED wait times, with providers now utilizing the waiting room or ACS to initiate care. Therefore, the objective of this study is to evaluate if initiating patient care in ACS helps to decrease time to disposition.

Methods: Retrospective data were collected on 61,869 patient encounters presenting to an academic medical center ED. Patients with an emergency severity index (ESI) of 1 were excluded. The "pre-ACS" or control data consisted of 38,625 patient encounters from September 30, 2018 to October 1, 2019, prior to the development of ACS, in which the patient was seen by a physician after they were brought to an assigned ED room. The "post-ACS" study cohort consisted of 23,244 patient encounters from September 30, 2022 to October 1, 2023, after the initiation of ACS, during which patients were initially seen by a provider in an ACS. ACS at this institution included the three following areas: waiting room, ambulance waiting area, and a newly constructed ACS that was built next to the ED entrance on the first floor of the hospital. The newly constructed ACS consisted of 16 care spaces each containing an upright exam chair with dividers between each care space. Door-to-disposition time (DTD) was calculated by identifying the time when the patient entered the ED and the time when disposition was decided (admission requested or patient discharged). Using regression analysis, we compared the two data sets to determine significant differences among DTD time.

Results: The largest proportion of encounters were among ESI 3 patients, that is, 56.1%. There was a significant increase in median DTD for ESI 2 and 3 patients who were seen initially in an ACS compared to those who were not seen until they were in

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an assigned ER room. Specifically, there was a median increase of 40.9 min for ESI 2 patients and 18.8 min for ESI 3 patients who were seen initially in an ACS ($p < 0.001$). There was a 29-min decrease in median DTD for ESI 5 patients who were seen in ACS ($p = 0.09$).

Conclusions: Initiating patient care earlier in ACS did not appear to decrease DTD time for patients in the ED. Overall, the benefits of early initiation of care likely lie elsewhere within patient care and the ED throughput process.

KEYWORDS
alternate care sites, door-to-disposition time, door-to-doctor, ED boarding, ED crowding, emergency severity index, waiting room

1 | INTRODUCTION

1.1 | Background

To help alleviate emergency department (ED) overflow during the COVID-19 pandemic surge, alternate care sites (ACS) were created amongst hospitals nationwide. An alternate care site is a wide-ranging term that can be defined as a treatment facility established in a non-traditional setting during a public-health crisis or other event which has caused strain on local medical resources, as a means of providing additional capacity to deliver medical care.[1] During the beginning of the COVID-19 pandemic, many ACS were built and constructed as entirely new treatment locations or placed in previously established hospital areas such as waiting rooms (WR) or hospital lobbies. For example, New York City's Javits Center, a large urban convention center, was transformed into an ACS that carried up to 1,000 patient beds.[2] Conversely, an ACS was created in the confines of a 52-square-foot conference room of a small, community ED with four patient treatment cubicles.[3] These treatment areas, whether having a maximum occupancy of five patients versus 1,000 were instrumental during the peak of the pandemic by helping to reduce burden on EDs and off-loading hospital systems.[4,5]

1.2 | Importance

ED overcrowding and long wait times have become persistent challenges in many healthcare systems.[6] Thus, despite the end of the pandemic surge, many of these ACS have remained functional as patient care areas, utilizing these ACS as potential solutions. Many institutions now allow and encourage providers to employ ACS, such as WR or hospital lobbies, to initiate patient care in an attempt to ameliorate overcrowding. This, in turn, may potentially free up ED resources for more critically ill patients while lowering wait times by diverting patients with lower acuity conditions to ACS.

1.3 | Goals of this investigation

The objective of this study was to evaluate if initiating patient care in ACS that were created during the pandemic helps to improve ED workflow and throughput process by decreasing time to disposition.

2 | METHODS

2.1 | Study design

This is a retrospective analysis of data collected from consecutive patient encounters at an urban, academic, tertiary care medical center ED. The "before" or "pre-ACS" control data consisted of patient encounters before the development of ACS, in which patients were evaluated by a physician after they were brought to an assigned ED room. The "after" or "post-ACS" study cohort consisted of patient encounters after the initiation of ACS, in which patients were initially seen by a provider in an ACS. As this was a quality assurance initiative, this study received an exemption from the institutional review board.

2.2 | Setting

This study was performed at an academic, tertiary care medical center ED located in an urban setting with an annual census of about 50,000 patients. Without ACS, this ED contains 60 beds that are zoned by varying levels of acuity. The "core" area of this ED exists for the highest level of acuity and holds 25 patient beds. The "periphery" area of this ED contains 35 patient beds and holds patients with lower levels of acuity. This ED is staffed with a minimum of one attending physician and three resident physicians to a maximum of four attending physicians and seven resident physicians, depending on the day of the week and time of day.

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2.3 | Exposure – alternate care sites

Alternate care sites at this institution were created to help provide additional locations to deliver medical care in response to an increased number of patients presenting to the ED and overcrowding in the WR. The ACS at this institution included the three following areas: waiting room, ambulance waiting area and a newly constructed ACS that was built next to the ED entrance on the first floor of the hospital. The newly constructed ACS consisted of 16 care spaces each containing an upright, exam chair with dividers between each care space. The ED waiting room was an already established designated area with up to 12 waiting room chairs and four triage rooms, which were used to initiate treatment and MD evaluation during the COVID pandemic. Prior to the pandemic, this waiting room was only used for nursing triage and was not used for patient evaluation or treatment by physicians. The ambulance waiting area was a designated area near the ambulance entrance door that allowed for up to 11 stretchers to be placed which was also used to initiate treatment and MD evaluation during the COVID pandemic. All of the above care settings were used as ACS during the pandemic and then continued to be used as patient care areas after the peak of the pandemic. Both resident and attending physicians were the providers who initiated evaluation and treatment in these ACS. Similarly to all other areas of the ED, the resident physician evaluated the patient first and then presented the case to the attending physician who evaluated the patient subsequently after.

The Bottom Line

Many emergency departments (EDs) use alternate care sites (ACS), such as the waiting room or hospital lobby, to help alleviate patient overflows. In this analysis of patient encounters before ($n = 38{,}265$) and after ($n = 23{,}244$) implementation of ACS at an academic ED, initiating patient care earlier in ACS did not decrease door to disposition time.

2.4 | Selection of subjects

The pre-ACS control data consisted of patient encounters from September 30, 2018 to October 1, 2019, before the development of ACS. The post-ACS study cohort consisted of patient encounters after the initiation of ACS from September 30, 2022 to October 1, 2023. The post-ACS time period was after the second surge of the pandemic when COVID-related hospitalizations dropped and remained stable at less than a rate of 5 per 100,000 population.[7] Inclusion criterion included any patient that presented to the ED with a triage emergency severity index (ESI) of 2, 3, 4, or 5 assigned by a triage nurse. ESI is a tool used for ED triage in order to stratify patients based on acuity, ranging from level 1 (most urgent) to level 5 (least urgent). Patients with an ESI of 1 were excluded from this study due to their high acuity and immediate relocation to an ED room upon arrival.

2.5 | Measures/Outcomes

Door-to-disposition (DTD) time was calculated by identifying the time when the patient entered the ED and the time when disposition was decided (admission requested or patient discharged). Door-to-doctor time was calculated by identifying the time when the patient entered the ED and the time when an emergency physician (EP) initiated patient care by assigning their name to the patient. Control variables included patient age, patient sex, and month of year as they are known variables that can affect ED disposition time and/or ED length of stay (LOS).[8–11] Using quantile regression analysis controlled for age, sex, and month of year, we compared the pre-ACS and post-ACS data sets to determine significant differences among DTD time between both cohorts. Age was treated as a continuous variable, sex was dichotomous categorical (male vs. female), and month was categorical (12 levels: one for each month of the year).

2.6 | Data analysis

Independent samples *t*-tests were used to assess the demographics of age and gender. Chi-squared tests were used to assess the demographics of ESI and month of years. To model the differences in median DTD time between the pre-ACS and post-ACS periods, a quantile regression model was created with door-to-disposition time (continuous measure) as the dependent variable, the interaction between time-period (categorical variable with two levels: pre-ACS vs. post-ACS) and ESI (categorical variable with ESI-2 coded as the reference level) as the independent variable, while controlling for age, sex, and month (Table 1). The fitted model was then used to derive estimates of medians and 95% confidence intervals for each ESI level and time period for a prototype case (Table 2). All quantile regression analyses were conducted in R version 4.1.1.[12] Specifically, the quantreg package was used to estimate median DTD times.[13]

3 | RESULTS

During the pre-ACS control period (September 30, 2018 to October 1, 2019), there were 38,625 patient encounters. During the post-ACS study period (September 30, 2022 to October 1, 2023), there were 23,244 patient encounters. The largest proportion of encounters were among ESI 3 patients at 56.1%, followed by ESI 2 at 37.6%, ESI 4 at 6.2%, and ESI 5 at 0.2% (Table 3). Regression analysis showed an overall increase in median DTD for ESI 2 and 3 patients who were seen post-ACS in an ACS compared to those who were seen pre-ACS in an established ED room. Specifically, there was an increase in median DTD time of 40.9 min for ESI 2 patients who were seen in an ACS, compared to the respective ESI 2 patients who were seen in standard ED

TABLE 1 Table of coefficients from the quantile regression model.

Variable	Coefficient, 95% CI	*p*-value
Intercept	255.6 (251.0–261.1)	<0.001
post-ACS	40.9 (35.9–45.4)	<0.001
ESI3	44.3 (40.7-47.6)	<0.001
ESI4	−69.6 (−76.2 to −64.8)	<0.001
ESI5	−128.9 (−147.9 to −101.6)	<0.001
Age (centered)	0.4 (0.4–0.5)	<0.001
Sex = Male	−21.2 (−23.6 to −18.4)	<0.001
Feb	5.2 (−1.3 to 10.8)	0.142
Mar	−1.6 (−8.1 to 5.1)	0.645
Apr	−14.5 (−21.6 to −8.9)	<0.001
May	−18.5 (−25.2 to −12.0)	<0.001
Jun	−8.9 (−16.0 to −2.3)	0.014
Jul	21.5 (14.6 to 28.1)	<0.001
Aug	41.5 (34.1 to 47.7)	<0.001
Sep	33.0 (25.5 to 38.7)	<0.001
Oct	6.0 (0.0 to 12.0)	0.07
Nov	−5.3 (−11.9 to 1.8)	0.147
Dec	−5.3 (−11.9 to 1.8)	<0.001
post-ACS * ESI3	−22.1 (−28.2 to −15.3)	<0.001
post-ACS * ESI4	−38.2 (−46.0 to −27.5)	<0.001
post-ACS * ESI5	−70.0 (−99.6 to −25.4)	<0.001

Note: This model uses door-to-disposition time as the dependent variable. The independent variables are the study period (post-ACS), ESI, the interaction between ESI and post-ACS period, age (mean-centered), sex, and month. The coefficients represent median differences between the reference and the represented categories for each variable while controlling for the other variables: for example, the Sex = Male has a coefficient of −21.2, indicating that the median door-to-disposition time is about 21 min lower in men as compared to women, holding all other variables constant.
Abbreviation: CI, confidence interval; ESI, emergency severity index.

rooms pre-ACS ($p < 0.001$) (Table 2). Similarly, there was an increase in median DTD time of 18.8 min for ESI 3 patients who were seen in an ACS, compared to the respective ESI 3 patients who were seen in standard ED rooms pre-ACS ($p < 0.001$) (Table 2). Conversely, there was a 29.1 min decrease in median DTD for ESI 5 patients who were seen in ACS compared to standard ED rooms; however, this difference was not statistically significant ($p = 0.09$).

For patients who were seen in ACS, there was an overall higher median DTD of 4.9 h (median interquartile range [IQR]: 3.2–7.2), while the median DTD for patients who were seen in standard ED rooms pre-ACS was 4.5 h (median IQR: 2.9–6.5) (Table 4). ESI 3 patients represented the largest sub-group (56.1%) and had a median DTD of 5.2 h (median IQR: 3.5–7.4) for patients seen in ACS and 4.9 h (median IQR: 3.3–6.8) for patients seen in standard ED rooms pre-ACS (Table 4).

4 | LIMITATIONS

The largest limitation of this study is that our comparison of the pre-ACS group and post-ACS group is delineated by the COVID-19 pandemic. Our pre-ACS group is pre-pandemic because it was prior to the development of ACS that were created because of the pandemic. Our post-ACS group is when the ACS began being used for non-pandemic purposes and simply as alternate sites for physician evaluation. Additionally, this study does not evaluate other variables that likely exist after the pandemic including staff shortages, increased ED volume, increased ED acuity, all of which likely affect DTD. This is also a single institution study which can limit the generalizability of the conclusions of this study and introduce institution-specific bias. Additionally, this study is a retrospective review which exists as a limitation, as all data were collected via retrospective data analysis and chart review. Lastly, although we identified possible confounders and controlled our statistical analysis for patient age, sex, and month of the year, we were unable to control for a few other variables such as increases or decreases in overall ED volume, boarding, crowding, and staff shortages from 2019 to 2021.

5 | DISCUSSION

Initiating patient care in ACS was not associated with decreased time to disposition in the ED for ESI 2, 3, and 4 patients. There was a 29.1 min decrease in median DTD for ESI 5 patients who were seen in ACS compared to standard ED rooms however, this difference was not statistically significant nor clinically important.

Many studies conducted prior to the COVID-19 pandemic suggested that ACS could improve ED throughput and LOS. A retrospective, interventional study in 2012 found a 23-min decrease in median ED LOS for patients whose care was initiated in an alternate care site (waiting room).[14] Another study conducted in 2001 similarly noted an 18% reduction in ED LOS for patients that were initially seen by a physician in the ED waiting room.[15] Additionally, a 2011 systematic review pooled the data from two randomized control trials of ACS and found an overall reduction in ED LOS of 37 min.[16] In contrast to these prior studies, our study does not demonstrate a significant decrease in ED LOS for those patients whose care was initiated in an ACS. In this study, where ACS were developed during the peak of the pandemic to ameliorate ED burden, the continued use of these ACS does not appear to have any benefit on reducing time to disposition for the overall majority of patients.

The reasons for our observations are likely multifactorial. Time to ED disposition is often limited by a variety of ED variables including blood work draws, intravenous (IV) placement, computed tomography (CT) scans (which are often dependent on IV placement), medication administration, and consultant evaluation, many of which do not occur in ACS and WR. An important explanation for this is that these ACS do not have designated nursing staff and despite orders being placed

TABLE 2 Table of door-to-disposition (DTD) time (minutes) per emergency severity index (ESI) level: pre-alternate care sites (pre-ACS) versus post-ACS.

ESI	Pre-ACS DTD (min) (median, 95% CI)	Post-ACS DTD (min) (median, 95% CI)	Median difference (95% CI)	*p*-value
2	255.6 (249.9–261.4)	296.5 (290.0–303.0)	40.9 (35.9–45.4)	<0.001
3	300.0 (294.7–305.2)	318.8 (312.9–324.6)	18.8 (14.8–22.9)	<0.001
4	186.0 (178.6–193.4)	188.7 (180.4–197.1)	2.7 (−4.1–11.6)	0.55
5	126.7 (93.2–160.2)	97.6 (90.4–104.8)	−29.1 (−60.6–12.9)	0.09

Note: As the quantile regression model controls for a number of variables, these medians and 95% CIs are derived by choosing an arbitrary prototype case (female patient of average age seen in the month of January) and obtaining predicted values using the coefficients from the quantile regression model (Table 1A). The *p*-values are obtained by requesting contrasts from the quantile regression model comparing the pre-ACS and post-ACS within each ESI.
Abbreviation: CI, confidence interval.

TABLE 3 Study demographics and month of year: pre-alternate care sites (pre-ACS) (control) versus post-ACS (study).

	Overall (*n* = 61,869)	Pre-ACS (*n* = 38,625)	Post-ACS (*n* = 23,244)	*p*-value
Age (years, mean, SD)	54.22 (20.70)	54.01 (20.58)	54.57 (20.89)	<0.001
Sex = Male (*n*, %)	27,937 (45.2)	17,689 (45.8)	10,248 (44.1)	<0.001
ESI (*n*, %)				
2	23,238 (37.6)	14,795 (38.3)	8443 (36.3)	<0.001
3	34,715 (56.1)	21,382 (55.4)	13,333 (57.4)	
4	3809 (6.2)	2377 (6.2)	1432 (6.2)	
5	107 (0.2)	71 (0.2)	36 (0.2)	
Month (*n*, %)				
Jan	5899 (9.5)	3679 (9.5)	2220 (9.6)	<0.001
Feb	5439 (8.8)	3376 (8.7)	2063 (8.9)	
Mar	5405 (8.7)	3879 (10.0)	1526 (6.6)	
Apr	5460 (8.8)	3699 (9.6)	1761 (7.6)	
May	4732 (7.6)	2769 (7.2)	1963 (8.4)	
Jun	4816 (7.8)	2978 (7.7)	1838 (7.9)	
Jul	5391 (8.7)	3869 (10.0)	1522 (6.5)	
Aug	5667 (9.2)	3618 (9.4)	2049 (8.8)	
Sep	5419 (8.8)	3335 (8.6)	2084 (9.0)	
Oct	5966 (9.6)	3816 (9.9)	2150 (9.2)	
Nov	3813 (6.2)	1860 (4.8)	1953 (8.4)	
Dec	3862 (6.2)	1747 (4.5)	2115 (9.1)	

Abbreviation: ESI, emergency severity index.

by EPs, they often are not completed until the patient is brought back to an ED room with an assigned nurse. Additionally, ancillary staffing is limited in ACS, which impact flow and facilitation of disposition directly. In addition, ACS often require patients to be moved from ACS to a standard ED room when one is available which further strains limited resources and creates a delay. Our results further illustrate this concept by showing a 32-min reduction in door-to-doctor time for patients seen in ACS, yet no significant decrease in DTD time. This decrease demonstrates that physician evaluation and order placement are not the limiting factor for disposition and the bottleneck issue likely lies elsewhere. Overall, initiating patient care in ACS allows physicians to see patients faster, but does not appear to reduce time to disposition.

Additionally, many pre-existing healthcare challenges exacerbated by the COVID-19 pandemic might also be affecting ED throughout and disposition time. For example, many EDs are now experiencing significant increases in both volume and acuity "post-pandemic," while nursing shortages and clinician burnout, which otherwise might enable ancillary ED care in an ACS, are on the rise causing a dearth of staffing.[17] In an October 2021 survey of multiple clinicians and

TABLE 4 Overall door-to-disposition time (h) of pre-alternate care sites (pre-ACS) versus post-ACS.

Door-to-disposition time (hours) (median IQR)			
ESI	Pre-ACS	Post-ACS	Overall
2	**4.2** (2.6, 6.2)	**4.8** (3.2, 7.2)	**4.4** (2.8, 6.5)
	N = 14,795	*N = 8443*	*N = 23,238*
3	**4.9** (3.3, 6.8)	**5.2** (3.5, 7.4)	**5.0** (3.4, 7.0)
	N = 21,382	*N = 13,333*	*N = 34,715*
4	**2.9** (1.9, 4.2)	**3.0** (1.9, 4.5)	**3.0** (1.9, 4.3)
	N = 2377	*N = 1432*	*N = 3809*
5	**2.0** (1.2, 3.0)	**1.5** (0.8, 2.3)	**1.8** (1.0, 2.8)
	N = 71	*N = 36*	*N = 107*
Overall	**4.5** (2.9, 6.5)	**4.9** (3.2, 7.2)	
	N = 38,625	*N = 23,244*	

Abbreviations: ESI, emergency severity index; IQR, interquartile range.

clinical leaders, respondents note the top three problems facing EDs are boarding of patients awaiting an inpatient/observation bed, hiring and retaining quality staff, and clinician burnout. When compared to a pre-pandemic 2019 survey, these concerns have increased significantly with boarding, hiring and burnout up 22%, 30%, and 24%, respectively.[18] These new healthcare challenges and system demands are likely contributing to ED boarding and overcrowding, which in turn is likely hindering DTD. However, as illustrated in many prior studies, the large benefit of initiating care earlier in the ED likely lies elsewhere, such as decreasing LWBS (left without being seen) rates and earlier identification of high-risk patients.

Although this study demonstrates that the utilization of ACS that were created during the pandemic had a decrease in DTD for ESI 5 patients, it did not demonstrate a decrease in DTD time for a large majority of ED patients (ESI 2, 3, and 4). Additionally, given that our data demonstrate that ESI 2 patients at our institution might be less likely to have a quick disposition if seen in ACS, we might advocate for an even higher priority to be placed on moving these patients into the ED to be seen sooner, particularly in lieu of ESI 3 patients.

We believe the challenges associated with the utilization of ACS such as logistical and resource issues need to be addressed in order to maximize any possible benefit of ACS on DTD time. Further research is needed to determine the long-term effects of ACS utilization in EDs and to identify strategies to overcome the challenges associated with this approach.

Overall, this study found that the utilization of ACS that were created during the pandemic did not decrease DTD for ESI 2, 3, and 4 patients when compared to standard pre-ACS ED rooms. Our data suggest that initiating patient care earlier in ACS that were originally created during the pandemic does not appear to have significant benefit on DTD time.

AUTHOR CONTRIBUTIONS

Alyssa Mangino: Conceived and designed the analysis; wrote the paper. **Lakshman Balaji**: Performed the analysis; contributed data and analysis tools; edited the paper. **Bryan Stenson**: Conceived and designed the analysis; contributed analysis tools; edited the paper. **Larry A. Nathanson**: Collected the data; contributed data tools. **David Chiu**: Conceived and designed the analysis; contributed analysis tools; edited the paper. **Shamai A. Grossman**: Conceived and designed the analysis; contributed data and analysis tools; wrote the paper.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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REFERENCES

1. Assistant Secretary for Preparedness and Response. *Federal Healthcare Resilience Task Force Alternate Care Site (ACS) Toolkit*. US Department of Health and Human Services; 2020.
2. Thompson CN, Mugford C, Merriman JR, et al. Healthcare worker safety program in a coronavirus disease 2019 (COVID-19) alternate care site: the Javits New York Medical Station experience. *Infect Control Hosp Epidemiol*. 2023;44(2):268-276.
3. Garra G, Gupta S, Ferrante S, Apterbach W. Dedicated area within the emergency department versus an outside dedicated area for evaluation and management of suspected coronavirus disease 2019. *J Am Coll Emerg Physicians Open*. 2020;1(6):1349-1353.
4. Zhang FW, Meghoo CA, Staats KL, et al. *Reduction in Hospital Transfers at a US COVID-19 Alternate Care Site: Maintaining Surge Capacity Support in Imperial County, California*. Disaster Medicine and Public Health Preparedness; 2022.
5. Christensen K, Metzner M, Lovett-Floom L, et al. *Utilization of Alternate Care Sites During the COVID-19 Surge and Mass Care: California, 2020–2021*. Disaster Medicine and Public Health Preparedness; 2022.
6. Savioli G, Ceresa IF, Gri N, et al. Emergency department overcrowding: understanding the factors to find corresponding solutions. *J Pers Med*. 2022;12(2):279.
7. COVID-NET Interactive Dashboard. Centers for Disease Control and Prevention; 2023. https://www.cdc.gov/coronavirus/2019-ncov/covidnetdashboard/de/powerbi/dashboard.html
8. Ogliari G, Coffey F, Keillor L, et al. Emergency department use and length of stay by younger and older adults: Nottingham cohort study in the emergency department (NOCED). *Aging Clin Exp Res*. 2022;34:2873-2885.
9. Onal EG, Knier K, Hunt AW, et al. Comparison of emergency department throughput and process times between male and female patients: a retrospective cohort investigation by the Reducing Disparities Increasing Equity in Emergency Medicine Study Group. *J Am Coll Emerg Physicians Open*. 2022;3(5):e12792.
10. Anesi G, Xiong R, Delgado M. Frequency and trends of pre-pandemic surge periods in U.S. emergency departments, 2006–2019. *Critical Care Explorations*. 2023;5(8):e0954.
11. Abir M, Goldstick JE, Malsberger R, et al. Evaluating the impact of emergency department crowding on disposition patterns and outcomes of discharged patients. *Int J Emerg Med*. 2019;12(1):4. doi:10.1186/s12245-019-0223-1

12. R Core Team. A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria; 2021. https://www.R-project.org/
13. Koenker R, et al. Quantile regression. R package version. CRAN.R Project: Ver 5.93. 2022. https://CRAN.R-project.org/package=quantreg
14. Imperato J, Morris DS, Binder D, et al. Physician in triage improves emergency department patient throughput. *Intern Emerg Med*. 2012;7:457-462.
15. Partovi SN, Nelson BK, Bryan ED, Walsh MJ. Faculty triage shortens emergency department length of stay. *Acad Emerg Med*. 2001;8(10):990-995.
16. Rowe BH, Guo X, Villa-Roel C, et al. The role of triage liaison physicians on mitigating overcrowding in emergency departments: a systematic review. *Acad Emerg Med*. 2011;18(2):111-120.
17. Shanafelt TD, West CP, Dyrbye LN, et al. Changes in burnout and satisfaction with work-life integration in physicians during the first 2 years of the COVID-19 pandemic. *Mayo Clin Proc*. 2022;97(12):2248-2258.
18. Zane R. The hardest time in the history of emergency medicine. *NEJM Catal Innov Care Deliv*. 2022;3(2). doi:10.1056/CAT.22.0009

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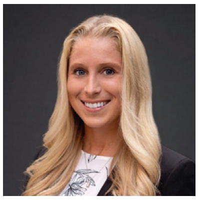
AUTHOR BIOGRAPHY



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