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Evaluation of a transitions clinic to bridge emergency department and primary care

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Abstract

Background: Suboptimal transitions from the emergency department (ED) to ambulatory settings contribute to poor clinical outcomes and unnecessary nonurgent ED utilization. Care transition clinics (CTCs) are a potential solution by providing ED follow-up and facilitating the bridge to longer-term primary care.

Objective: The objective was to evaluate the implementation of an ED transitions clinic on 30-day ED revisits and hospital readmissions.

Designs: Retrospective cross-sectional study.

Settings and Participants: This study included adults 18 years and older discharged from the ED and reeferred to the CTC.

Main Outcome and Measures: Appointment attendance, follow-up time, and frequencies of care type provided were computed to assess clinic utilization. Rates of 30-day ED revisit and hospital admission were compared between completed and missed appointments using logistic regression.

Results: Between March 2021 and March 2022, 373 patients were referred to the CTC totaling 405 appointments. Half (53%) of appointments were completed with a median follow-up time of 4 days (IQR = [2, 7]). The most common care types provided were wound care (44%) and clinical problem management (33%), with wound care appointments more likely to be completed compared with clinical appointments (OR = 1.7, CI = [1.1, 2.8], $p = .03$). Patients who completed their CTC appointment were 50% less likely to return to the ED in 30 days compared with those who did not complete their appointment (OR = 0.51, CI = [0.27, 0.98], $p < .05$). No effect was seen for CTC appointment completion on hospital readmission. Transition clinics are a viable method to provide timely access to follow-up for patients discharged from the ED and may help reduce excess ED use for ambulatory care needs.

INTRODUCTION

Patients seen at the emergency department (ED) are frequently discharged with referrals for outpatient follow-up. Successful completion of ED follow-up has been linked to improved health outcomes and reduced ED utilization for nonurgent needs.[1,2] Important issues addressed during follow-up include adherence to medications and treatment plans, understanding of discharge instructions, education of disease, changes in symptoms, and lack of social support.[3] Patients who do not complete ambulatory follow-up are more likely to return to the ED and are at higher risk for adverse events, including double the risk of 30-day postdischarge mortality.[2,4] Discontinuity between ED care and outpatient care can lead to overtesting and conflicting care plans, and as a result, less-effective chronic disease management.[5] Thus, ensuring timely access to outpatient care is an important target for improving quality and outcomes.

However, the rate of outpatient adherence following an ED visit is poor, estimated to be between 26% and 56%.[2,6] Inability to secure a timely follow-up appointment is a significant barrier for many patients, particularly for those on Medicaid[2,7] and those lacking primary care physicians.[8–10] Furthermore, patients seen in the ED after weekday work hours or on weekends typically cannot have follow-up appointments made while being seen in the ED.[11] This often requires the ED to either discharge the patient home with follow-up in the ED for care that does not require ED-level care or admit the patient for follow-up of the clinical issue which otherwise would not have required hospitalization. Patients who are discharged home with the expectation that they return to the ED for follow-up often do not show up for these appointments since the ED wait times are long and their issue is not urgent which can lead to even longer wait times. Lack of follow-up can lead to the worsening of acute or chronic medical conditions resulting in rehospitalization.

Care transition clinics (CTCs) provide one solution to meet the time-sensitive, acute care needs of patients discharged from the ED while facilitating the transition to longer-term ambulatory care. CTCs complement the services of traditional phone-based case management services by providing on-site medical care. Importantly, follow-up appointments with the CTC are arranged prior to ED discharge. Studies show that patients who have access to follow-up within 1 week of an ED visit, with the appointment made at the time of ED discharge, are more likely to adhere to outpatient follow-up care.[1,9,12] Finally, CTCs have the benefit of a dedicated team of patient advocates to assist with social challenges that may not be addressed in the emergency setting. CTC interventions have historically been employed in posthospitalization settings with success, reducing hospital readmission by 33%.[13,14] CTC interventions in the post-ED setting are a relatively newer concept but have also been shown to successfully reduce subsequent ED revisits and hospitalizations.[15,16]

The University of Chicago Medicine ED Care Transitions Clinic was established in 2020 to provide follow-up visits for patients discharged from the ED and to bridge their transition to primary care. The clinic is equipped to handle conditions including suture removal, medication refill, and lab follow-up, and includes patient advocates to connect patients with longer-term care. The objective of this paper is to describe and evaluate the initiation of the CTC on 30-day ED revisit and hospital admissions.

METHODS

Study design

This retrospective cross-sectional study included adults discharged from the University of Chicago Medicine ED and referred to the CTC between March 2021 and March 2022, 3 months after clinic establishment in November 2020 to allow for time to formalize data-collecting metrics. Patient demographic and clinical data were obtained from electronic health records. Information regarding CTC encounters was obtained from a prospectively maintained program database.

Setting and intervention

The University of Chicago Medicine is a tertiary care center and teaching hospital located on the South Side of Chicago. The ED has approximately 75,000 visits per year and serves a vulnerable high-utilizing patient population with a high proportion of persons experiencing homelessness and those who are uninsured or underinsured. Many patients lack a relationship with a primary care provider.

The University of Chicago CTC was established in 2020 initially to provide testing and care for patients with possible or confirmed COVID-19 infections. The CTC expanded to develop and implement programs aimed at reducing ED visits. One of the programs developed was the ED transition program which aimed to provide temporary medical care for patients discharged from the ED and facilitate their transition to longer-term ambulatory care. Patients who required short-term follow-up for a medical issue meeting the CTC inclusion criteria (Supporting Information: Appendix Table 1) identified in the ED visit could be assigned a one-time CTC clinic appointment prior to being discharged from the ED. At the time of data collection, the CTC was staffed by four to five full-time advanced practice providers with the capacity to see up to three ED transition patients per day among their other visits for other CTC programs.

The process to receive care was as follows: during the ED discharge process, ED clinicians identified patients who were appropriate candidates (lack of established primary care physician, acute medical care need) and provided patients with an exact date and time for a follow-up appointment in the CTC. Appointments were typically attainable within 1–4 days of the ED visit. During the CTC visit, advanced practice clinicians would provide wound care, manage chronic disease(s), follow-up labs, and perform basic procedures as needed to follow up the medical care need(s) identified in the ED. The patient could also be seen by a patient advocate whose primary role is to identify primary care clinicians in the

community with whom the patient can continue to follow for their acute care needs as well as build longer-lasting clinical care relationships. In addition to this primary role, our advocates provide support in identifying specialist clinicians. In terms of social support, our advocates help arrange transportation to clinic appointments, provide education on diagnoses, and provide other ad hoc support for social care needs.

Analysis

The primary outcome was all-cause ED revisit within 30 days of the ED visit. A secondary outcome was all-cause of hospital admission within 30 days of the first ED visit, excluding scheduled hospitalizations and direct admissions from the CTC, since these were not considered to be adverse events. Rates of ED revisit and hospital admission were compared between patients who completed their CTC appointment and patients who missed their CTC appointment using χ^2 tests. Results were verified with logistic regression controlling for demographics and factors known to influence ED utilization including age, gender, race, ethnicity, whether the patient's residence was located in the same ZIP code as the CTC, and insurance status.[2]

Process measures assessed included appointment attendance, time from scheduling to appointment, and frequency of care type provided. Care type categories included wound care (e.g., suture removal, abscess drainage), clinical problem management (e.g., COPD exacerbation, COVID, UTI), lab follow-up (e.g., Cr check, Hgb check), and procedure (e.g., X-ray, PPD test, rabies vaccine). A no-show analysis was conducted to identify patient and appointment factors associated with no-shows using χ^2 tests and logistic regression controlling for age, gender, race, ethnicity, whether the patient's residence was located in the same ZIP code as the CTC, and insurance status. The logistic regression model was also conducted on subsets of patients stratified by insurance status to assess potential differences in the effectiveness of the CTC intervention for Medicaid versus non-Medicaid insured patients.

RESULTS

Patient characteristics

In the 12-month study period, 373 patients were referred to the CTC by the ED (Table 1). The mean age was 45 (*SD* = 18), with most patients being under the age of 65 (82%). Patients were evenly split by gender. The majority of patients identified as Black (87%) and were on public insurance (80%).

Clinic utilization

There were a total of 405 CTC appointments scheduled, with a median time from scheduling to appointment of 4 days (IQR = [2, 7]).

TABLE 1 Characteristics of patients referred to the CTC overall and by completed versus missed CTC visit

Characteristic *N*	All 373 # pts (%)	Completed 194 # pts (%)	Missed 179 # pts (%)	χ^2 *p*
Age				.58
18–39	167 (45)	91 (47)	76 (42)	
40–64	138 (37)	71 (37)	67 (37)	
65+	68 (18)	32 (16)	36 (20)	
Gender				.70
Male	191 (51)	98 (51)	95 (53)	
Female	182 (49)	96 (49)	84 (47)	
Race				.09
Black	325 (87)	163 (84)	162 (91)	
White	23 (6)	13 (7)	10 (6)	
Other	25 (7)	18 (9)	7 (4)	
Ethnicity				.23
Hispanic or Latino	14 (4)	10 (5)	4 (2)	
ZIP code				.31
Reside in same ZIP as hospital		32 (16)	22 (12)	
Primary health insurance				.05
Medicare	78 (21)	38 (20)	40 (22)	
Medicaid	191 (51)	90 (46)	101 (56)	
Private payor	65 (17)	41 (21)	24 (13)	
None	39 (10)	25 (13)	14 (8)	

Note: χ^2 tests performed to test differences in category frequencies.
Abbreviations: CTC, care transition clinic; pts, patients.

Of scheduled appointments, approximately half (53%) were completed. Of patients who attended their first CTC appointment, 20 patients (5%) returned to the CTC for ongoing care related to the initial ED encounter. Only three patients returned to the CTC for unrelated ED encounters. All other patients visited the CTC one time only.

The most common care type was wound care (44%, Top 3: suture/staple removal, cellulitis, abscess), followed by clinical problem management (33%, Top 3: elevated blood pressure, deep venous thrombosis/pulmonary embolism, edema), lab follow-up, and procedure (Table 2). Wound checks had a higher rate of appointment completion compared with clinical appointments (show rate: 63% vs. 47%; Table 2).

In the no-show analysis, patients who failed to complete their appointment were more likely to be on Medicaid insurance (56%) than other types of insurance (8–22%; $p = .05$; Table 1). We found no significant difference between show and no-show visits in terms of other patient factors including age, gender, race, and ethnicity. Controlling for demographic factors, Medicaid patients were 40%

TABLE 2 CTC appointments by care type provided and show rate

	#	% of all appts	Show rate (%)
Care type provided			
Wound care	179	44	63
Clinical problem management	134	33	47
Lab follow-up	83	20	43
Procedure	9	2	56
Total	405	100	53

Abbreviations: appts, appointments; CTC, care transition clinic.

TABLE 3 Results for multivariate logistic regression estimating appointment completion from care type and demographic variables

Outcome variable	Completed appointment (1 = completed, 0 = missed)		
Independent variable	OR	95% CI	*p*
Care type (ref: clinical management)			
Wound care	1.70	[1.05, 2.76]	.03
Lab follow-up	0.83	[0.46, 1.50]	.54
Procedure	1.28	[0.27, 6.17]	.76
Medicaid insurance (ref: not Medicaid)	0.62	[0.40, 0.97]	.04
Age (years, continuous)	1.00	[0.98, 1.01]	.48
Male (ref: Female)	0.83	[0.54, 1.26]	.38
Black race (ref: not Black)	0.88	[0.40, 1.91]	.74
Hispanic ethnicity (ref: not Hispanic)	0.50	[0.13, 1.98]	.33
ZIP same as hospital (ref: not same ZIP)	1.26	[0.70, 2.27]	.44

less likely to complete their appointment compared with patients on other types of insurance (OR = 0.62, CI = [0.40, 0.97], $p = .04$; Table 3). Wound check appointments were 1.7 times more likely to be completed compared with clinical problem management appointments (OR = 1.7, CI = [1.1, 2.8], $p = .03$; Table 3).

Outcomes

Patients who completed their CTC appointment were half as likely to revisit the ED within 30 days compared with patients who did not complete their CTC appointment (10% vs. 20%, $p = .003$). They were slightly mṭore likely to be admitted to the hospital within 30 days, but this was not statistically significant (6% vs. 3.5%, $p = .3$). When controlling for demographic variables and care type provided, the relationship held, with patients

TABLE 4 Results for multivariate logistic regression estimating 30-day ED revisit from appointment completion and demographic variables

Outcome variable	ED revisit (1 = revisit, 0 = no revisit)		
Independent variable	OR	95% CI	*p*
Completed appointment (ref: missed appt)	0.51	[0.27, 0.98]	.045
Medicaid insurance (ref: not Medicaid)	3.10	[1.43, 6.73]	.004
Care type provided (ref: clinical management)			
Wound care	0.77	[0.37, 1.59]	.48
Lab follow-up	0.64	[0.28, 1.47]	.29
Procedure	1.05	[0.09, 11.78]	.97
Age (years, continuous)	1.03	[1.01. 1.05]	.002
Male (ref: female)	1.88	[0.99, 3.58]	.05
Black race (ref: not Black)	2.00	[0.42, 9.49]	.39
Hispanic ethnicity (ref: not Hispanic)	0.31	[0.03, 2.79]	.30
ZIP same as hospital (ref: not same ZIP)	0.77	[0.41, 1.45]	.42

Abbreviations: appt, appointment; ED, emergency department.

completing their CTC appointment being half as likely to revisit the ED within 30 days compared with patients who did not complete their CTC appointment (OR = 0.51, CI = [0.27, 0.98], $p < .05$; Table 4). In the analysis stratifying by Medicaid status, completion of a CTC appointment was associated with a 60% reduction in odds of 30-day ED revisit (OR = 0.39, CI = [0.16, 0.98]). This effect was not seen on the regression fitted with the subset of non-Medicaid insured patients (OR = 0.6, CI = [0.21, 1.17]). The efficacy of the CTC in reducing the rate of ED revisit also held when stratifying by care type, with CTC appointment completion being negatively associated with 30-day ED revisit for wound care visits (OR = 0.28, 95% CI = [0.08, 0.90]) and clinical visits (OR = 0.32, 95% CI = [0.11, 0.97]). The subset of laboratory appointments and procedure appointments were not analyzed due to insufficient sample size.

Model evaluation

The pseudo-R^2 for the model predicting ED revisit from CTC appointment completion and other covariates is 0.12. While not a very high metric, the goal of this study was to evaluate relationships between variables of interest, not to explain 100% of outcome variance. While there may be other factors affecting ED revisit that were not included in the model, the relationship observed between CTC appointment completion and ED revisit remains valid and useful.

DISCUSSION

In this evaluation of an ED Care Transitions Clinic, we demonstrated the ability of a CTC intervention to provide timely access to follow-up medical care and social assistance for high-risk patients discharged from the ED. Completion of CTC appointments was associated with reduced 30-day ED revisit rate but not the 30-day hospitalization rate. This finding was robust to sensitivity tests in which we stratified by insurance status and care type. However, a significant proportion of patients failed to complete their follow-up appointment.

Our research adds to the small but growing body of literature on post-ED CTCs. Similar to transition interventions at Brigham Health and Harborview Medical Center, we found that early follow-up combined with intensive social resource assistance significantly reduced subsequent ED visits versus a comparator group.[15,16] Other similar care transition interventions found no difference in the 30-day ED revisits, but primary care engagement was improved.[3,17] Regarding subsequent hospitalization, we found that CTC participants were slightly more likely to be hospitalized within 30 days, though the results were not statistically significant. This contrasts with one study of a hospitalist-staffed post-discharge clinic that was able to reduce subsequent hospitalizations by 42%.[14] This may be due to differences in patient population, as our population had a much higher percentage of Medicaid and minority patients. Another explanation is that the low rate of hospitalization post-ED visit may have underpowered this analysis.

Our CTC differs from previous ED care transitions interventions in several key ways. First, in contrast to traditional ED care transition interventions such as phone-based methods[18] or home visits,[3] the CTC provides on-site medical care during the high-risk post-ED discharge period by clinicians. This in-person care and hand-off to primary care clinicians may help stabilize patients' medical conditions and reduce disease exacerbations resulting in ED revisit. This concept is supported by studies that found interventions involving patient education but not on-site medical treatment improved follow-up behavior (outpatient follow-up, red flag knowledge) but had no effect on subsequent ED utilization.[3,19] Second, CTC appointments are scheduled prior to ED discharge. Patients who have their follow-up scheduled before leaving the ED are more likely to attend their follow-up appointment.[6] Third, patients are seen in a timely manner, with a median follow-up time of 4 days, which is on par with or faster than follow-up times reported at other transition clinics.[15,16] Time to follow-up has been identified as a significant factor for appointment attendance and subsequent healthcare utilization in previous studies.[1,2] In the Brigham CTC, patients were seen over multiple visits. In our clinic, the vast majority of patients were seen for one visit only, suggesting that a short-term strategy is also a viable method to reduce ED revisits.

One of the main strengths of this study was the success of the CTC intervention despite a study population at high risk of readmissions and adverse outcomes. Historically, Medicaid patients are at higher risk of readmission compared with those with private insurance due to barriers to outpatient care and low physician willingness to care for Medicaid patients.[2,8,20,21] In our intervention group, 46% were on Medicaid and 25% had no insurance. In the analysis stratified by insurance status, completion of CTC appointment was associated with significantly reduced odds of ED revisit for Medicaid patients, despite this group being significantly less likely to complete their CTC visit. This protective effect was not seen in the regression fitted with the group of non-Medicaid insured patients. Thus, the CTC intervention may be particularly effective for uninsured and underinsured patients. This may be because of the CTC's focus on timeliness, access, and convenience. A study of barriers to care for Medicaid patients identified the inability to attain timely appointments, wait times, limited clinic hours, and lack of transportation as the main factors driving ED utilization.[16] The CTC model addresses these barriers by allowing patients to schedule appointments during off hours at the ED and meet with patient advocates to address transportation and other social challenges.

In terms of clinic utilization, we found that appointment follow-through was a major drop-off point, with only half of the patients arriving for their appointment. No-show rates are an extremely common challenge for many ED follow-up interventions, which report similar show rates.[15,16] In our no-show analysis, we found that Medicaid patients were significantly less likely to complete their appointment. This is in line with previous research reporting that insurance status is associated with access to timely follow-up ambulatory care.[22] Early outreach by patient advocates to initiate the social resource process ahead of scheduled appointment time may reduce the risk of no-show, an approach used with success at another transition clinic.[13] Alternatively, the option for virtual appointments for care not requiring in-person evaluation may increase patient engagement. In a recent study of trauma patients discharged from the ED, the most common reason for no-shows was the patient perception that the appointment was not needed.[23] While these patients may not undertake the effort to attend a physical appointment, they may still be reachable by phone or video. Telemedicine-enhanced acute care is feasible and acceptable and has been shown to reduce ED visits for nursing home residents.[24]

Another notable finding was that wound care was the most common service provided by the CTC, even more so than clinical disease management (within this, primarily exacerbations of chronic disease). While wound issues make up 4% of ED visits,[25] they composed 44% of CTC visits. Furthermore, wound care visits were 1.7 times more likely to be completed compared with clinical disease visits. This difference could suggest that the CTC model is most effective for addressing acute procedural issues such as suture removal and abscess drainage, while chronic disease management is better serviced by longitudinal care involving stronger doctor–patient relationships. This is especially important because chronic disease is associated with higher morbidity and mortality than procedural visits: patients discharged from the ED with diagnoses of chronic conditions have double the risk of subsequent adverse health outcomes compared with patients of similar health status discharged for other reasons.[26] This underscores the importance of the CTC's aim to refer patients to primary care. The CTC plays a different role in

wound-care visits. Although the vast majority of ED wound-related visits are discharged home due to lower acuity, patients are still at risk of adverse events, with one multicenter ED study finding that a quarter of patients had treatment failure within 7 days of incision and drainage of abscess,[27] and another study finding that 3% of all traumatic lacerations become infected.[28] Interventions to address this problem include telehealth/smartphone-based follow-up,[29,30] but as adverse outcomes are more common in low socioeconomic status patients who may not have access to technology, a physical brick-and-mortar approach such as the CTC may be more effective for preventing adverse events following wound-care ED visits.

Further research should examine patient outcomes in the longer term. To date, we do not have follow-up data on whether patients attended their scheduled primary care appointments and/or maintained the primary care relationships initiated at the CTC; these data would be an important metric for future studies. Other postdischarge patient outcomes such as mortality should be assessed in future analyses. A recent study of more than 9 million Medicare beneficiaries found that outpatient follow-up was associated with a 51% reduction in mortality in 30 days.[2] Whether CTC interventions can facilitate this reduction in mortality is an area for further investigation. From a health systems perspective, a cost-effective analysis could evaluate whether CTCs can reduce overall healthcare spending. This is especially relevant given that many of the operational aspects of the CTC, such as timely access to care and the use of a dedicated team of advanced practice nurses to serve a relatively small population and ensure high-quality care for our patients, also incur significant costs. Finally, the effect of CTCs on healthcare utilization and patient outcomes should be further evaluated with multisite trials to understand generalizability.

This study has important limitations. One of the stated goals of the CTC is to link patients without a usual source of care to more permanent primary care sites. However, due to system incompatibility, we were unable to follow up with patients to determine whether they actually established care with a primary care site. Second, as a retrospective chart review analysis, there was a lack of predetermined control of "usual care" so the group of patients who missed their appointments was used as the control group. Although missed appointments are not the ideal comparison group, this methodology of comparing missed versus completed appointments has been used in other care transition intervention studies.[13,15] Third, although we accounted for demographic factors including age, race, ethnicity, gender, and ZIP code, statistical analysis did not control for other possible confounders such as the reason for hospitalization, measures of illness severity, comorbidities, or patient health literacy. Our patient population is predominantly urban, Black, and of lower socioeconomic status, which may not be applicable to other patient populations, limiting generalizability. The strength of our study is that our intervention and analysis use real, practice-based data that can serve as a model for other institutions seeking to build programs to reduce ED burden and support populations at high-risk for readmission.

CONCLUSIONS

Transition clinics are a viable method to provide timely access to follow-up for patients discharged from the ED and may help reduce excess ED use for ambulatory care needs. More research should be done to investigate the factors influencing follow-up completion and what can be done to increase appointment attendance.

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CONFLICT OF INTEREST STATEMENT

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REFERENCES

1. Coppa K, Kim EJ, Oppenheim MI, Bock KR, Conigliaro J, Hirsch JS. Examination of post-discharge follow-up appointment status and 30-day readmission. *J Gen Intern Med*. 2021;36(5):1214-1221. doi:10.1007/s11606-020-06569-5
2. Lin MP, Burke RC, Orav EJ, Friend TH, Burke LG. Ambulatory follow-up and outcomes among medicare beneficiaries after emergency department discharge. *JAMA Network Open*. 2020;3(10):e2019878. doi:10.1001/jamanetworkopen.2020.19878
3. Jacobsohn GC, Jones CMC, Green RK, et al. Effectiveness of a care transitions intervention for older adults discharged home from the emergency department: a randomized controlled trial. *Acad Emerg Med*. 2022;29(1):51-63. doi:10.1111/acem.14357
4. Hastings SN, Oddone EZ, Fillenbaum G, Sloane RJ, Schmader KE. Frequency and predictors of adverse health outcomes in older medicare beneficiaries discharged from the emergency department. *Med Care*. 2008;46(8):771-777. doi:10.1097/MLR.0b013e3181791a2d
5. Bodenheimer T. Coordinating care—a perilous journey through the health care system. *N Engl J Med*. 2008;358(10):1064-1071. doi:10.1056/NEJMhpr0706165
6. Roy Magnusson A, Hedges JR, Vanko M, McCarten K, Moorhead JC. Follow-up compliance after emergency department evaluation. *Ann Emerg Med*. 1993;22(3):560-567. doi:10.1016/S0196-0644(05)81942-0
7. Chou SC, Deng Y, Smart J, Parwani V, Bernstein SL, Venkatesh AK. Insurance status and access to urgent primary care follow-up after an emergency department visit in 2016. *Ann Emerg Med*. 2018;71(4):487-496. doi:10.1016/j.annemergmed.2017.08.045
8. Kyriacou DN, Handel D, Stein AC, Nelson RR. Brief report: factors affecting outpatient follow-up compliance of emergency

department patients. *J Gen Intern Med*. 2005;20(10):938-942. doi:10.1111/j.1525-1497.2005.0216_1.x

9. Atzema CL, Maclagan LC. The transition of care between emergency department and primary care: a scoping study. *Acad Emerg Med*. 2017;24(2):201-215. doi:10.1111/acem.13125
10. Afilalo M, Xue X, Colacone A, Jourdenais E, Boivin JF, Grad R. Association between access to primary care and unplanned emergency department return visits among patients 75 years and older. *Can Fam Physician*. 2022;68(8):599-606. doi:10.46747/cfp.6808599
11. Morley C, Unwin M, Peterson GM, Stankovich J, Kinsman L. Emergency department crowding: a systematic review of causes, consequences and solutions. *PLoS ONE*. 2018;13(8):e0203316. doi:10.1371/journal.pone.0203316
12. Wiest D, Yang Q, Wilson C, Dravid N. Outcomes of a citywide campaign to reduce Medicaid hospital readmissions with connection to primary care within 7 days of hospital discharge. *JAMA Netw Open*. 2019;2(1):e187369. doi:10.1001/jamanetworkopen.2018.7369
13. Chakravarthy V, Ryan MJ, Jaffer A, et al. Efficacy of a transition clinic on hospital readmissions. *Am J Med*. 2018;131(2):178-184. doi:10.1016/j.amjmed.2017.08.037
14. Baldino M, Bonaguro AM, Burgwardt S, et al. Impact of a novel post-discharge transitions of care clinic on hospital readmissions. *J Natl Med Assoc*. 2021;113(2):133-141. doi:10.1016/j.jnma.2020.07.018
15. Elliott K, W. Klein J, Basu A, Sabbatini AK. Transitional care clinics for follow-up and primary care linkage for patients discharged from the ED. *Am J Emerg Med*. 2016;34(7):1230-1235. doi:10.1016/j.ajem.2016.03.029
16. Rotenstein L, Melia C, Samal L, et al. Development of a primary care transitions clinic in an academic medical center. *J Gen Intern Med*. 2022;37(3):582-589. doi:10.1007/s11606-021-07019-6
17. Carmel A, Steel P, Tanouye R, et al. Rapid primary care follow-up from the ED to reduce avoidable hospital admissions. *West J Emerg Med*. 2017;18(5):870-877. doi:10.5811/westjem.2017.5.33593
18. Harrison JD, Auerbach AD, Quinn K, Kynoch E, Mourad M. Assessing the impact of nurse post-discharge telephone calls on 30-day hospital readmission rates. *J Gen Intern Med*. 2014;29(11):1519-1525. doi:10.1007/s11606-014-2954-2
19. Englander H, Michaels L, Chan B, Kansagara D. The care transitions innovation (C-train) for socioeconomically disadvantaged adults: results of a cluster randomized controlled trial. *J Gen Intern Med*. 2014;29(11):1460-1467. doi:10.1007/s11606-014-2903-0
20. Cheung PT, Wiler JL, Lowe RA, Ginde AA. National study of barriers to timely primary care and emergency department utilization among Medicaid beneficiaries. *Ann Emerg Med*. 2012;60(1):4-10. doi:10.1016/j.annemergmed.2012.01.035
21. Biese K, Massing M, Platts-Mills TF, et al. Predictors of 30-day return following an emergency department visit for older adults. *N C Med J*. 2019;80(1):12-18. doi:10.18043/ncm.80.1.12
22. Asplin BR. Insurance Status and access to urgent ambulatory care follow-up appointments. *JAMA*. 2005;294(10):1248. doi:10.1001/jama.294.10.1248
23. Prescher H, Haravu P, Silva AK, Reid RR, Wang F. Trauma clinic follow-up: predictors of nonattendance and patient-reported reasons for no show. *Trauma*. 2022. doi:10.1177/14604086211052795
24. Hwang U, Shah MN, Han JH, Carpenter CR, Siu AL, Adams JG. Transforming emergency care for older adults. *Health Aff*. 2013;32(12):2116-2121. doi:10.1377/hlthaff.2013.0670
25. Hooker EA, Mallow PJ, Oglesby MM. Characteristics and trends of emergency department visits in the United States (2010–2014). *J Emerg Med*. 2019;56(3):344-351. doi:10.1016/j.jemermed.2018.12.025
26. Hastings SN, Whitson HE, Purser JL, Sloane RJ, Johnson KS. Emergency department discharge diagnosis and adverse health outcomes in older adults. *J Am Geriatr Soc*. 2009;57(10):1856-1861. doi:10.1111/j.1532-5415.2009.02434.x
27. Schmitz GR, Bruner D, Pitotti R, et al. Randomized controlled trial of trimethoprim-sulfamethoxazole for uncomplicated skin abscesses in patients at risk for community-associated methicillin-resistant staphylococcus aureus infection. *Ann Emerg Med*. 2010;56(3):283-287. doi:10.1016/j.annemergmed.2010.03.002
28. Quinn JV, Polevoi SK, Kohn MA. Traumatic lacerations: what are the risks for infection and has the 'golden period' of laceration care disappeared? *Emerg Med J*. 2014;31(2):96-100. doi:10.1136/emermed-2012-202143
29. Tolins ML, Hippe DS, Morse SC, Evans HL, Lober WB, Vrablik MC. Wound care follow-up from the emergency department using a mobile application: a pilot study. *J Emerg Med*. 2019;57(5):629-636. doi:10.1016/j.jemermed.2019.07.017
30. Koziatek C, Klein N, Mohan S, et al. Use of a telehealth follow-up system to facilitate treatment and discharge of emergency department patients with severe cellulitis. *Am J Emerg Med*. 2021;41:184-189. doi:10.1016/j.ajem.2020.01.061

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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