Emergency Department Visits in Veterans Affairs Medical Facilities

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Abstract

Objective: To identify the frequency of, and risk factors for, repeat emergency department (ED) visits and hospitalizations following a treat-and- release ED visit in patients from Veterans Affairs Medical Centers (VAMCs).

Study Design: Retrospective cohort study.

Methods: Subjects were veterans who visited 1 of 102 VAMC EDs between October 1, 2007, and June 30, 2008. Generalized estimating equations were used to identify factors related to repeat ED visits and hospitalizations within 30 days of the index ED visit.

Results: At their index ED visit, 80% of veterans were treated and released. Of these, 15% returned to the ED and 5% were hospitalized in the next 30 days. In adjusted models, factors associated with increased odds of repeat ED visits included homelessness (odds ratio [OR] 1.70; 95% confidence interval [CI] 1.59, 1.82) and having a previous ED visit (OR 1.66; 95% CI 1.58, 1.74). Odds of hospitalization were higher among older (OR 1.35; 95% CI 1.26, 1.46), homeless (OR 1.61; 95% CI 1.44, 1.80), and functionally impaired (OR 1.52; 95% CI 1.35, 1.76) veterans, those with greater comorbidity (OR 1.31; 95% CI 1.27, 1.34), previous hospitalization (OR 2.48; 95% CI 2.28, 2.70), and an original ED visit related to a chronic condition (OR 1.30; 95% CI 1.23, 1.37). Among veterans who returned to the ED, 71.7% did not see another VA outpatient provider between their original and return visits.

Conclusions: A substantial proportion of veterans treated and released from VAMC EDs returned to the ED or were hospitalized within 30 days.

The Veteran's Health Administration (VHA), one of the largest integrated healthcare delivery systems in the United States, is committed to providing access to emergency care for veterans.[1] According to a 2006 survey, more than 100 Veterans Affairs Medical Centers (VAMCs) have an emergency department (ED) and the mean annual census in these facilities is 13,371.[2] Despite the frequency and importance of ED visits, little is known about the care and outcomes of veterans who receive emergency services in VAMCs.

In EDs affiliated with nonfederal US hospitals, an estimated 85% of patients evaluated are not admitted to the hospital at the conclusion of their visit; rather, they are discharged home. [3] Emergency department visits that do not result in admission, commonly referred to as treat-and- release visits,[4] are important, not only because of their frequency, but also because repeat ED visits and/or hospitalizations are relatively common among some patient groups (5%−19% within 30 days after an index treat-and-release ED visit).[5–8] Veterans who utilize the VA health system are more likely than the general population to report poor physical and mental health and to have chronic health conditions.[9,10] While these characteristics suggest that VA users may be disproportionately at risk for repeated ED visits, veterans' access to VA primary care may mitigate against this risk. Thus, this study had 4 specific goals: (1) to describe national VAMC ED disposition rates; (2) to characterize the population of veterans with treat-and-release ED visits; (3) to determine the frequency of repeat ED visits, hospitalizations, and deaths experienced by veterans after being treated and released from a VAMC ED; and (4) to identify factors that predict repeat ED visits and hospitalizations within 30 days of the original treat-and-release ED visit.

METHODS

Overview

We conducted a retrospective cohort study using a national sample of veterans who had a VAMC ED visit over a 9-month observation period. Approval for the study was obtained from the Institutional Review Board of the Durham VAMC.

Data Sources

The data sets used for this study were drawn from administrative files maintained at the VA's central data repository, the Austin Information Technology Center. Age, sex, and date of death were drawn from the Vitals Mini File.[11] Dates of VA health service use (including outpatient visits, ED use, and hospitalizations) and data for all other independent variables were drawn from the VHA Medical SAS Datasets.[12]

Study Sample

The cohort consisted of VA users with an ED or urgent care clinic visit between October 1, 2007, and June 30, 2008. Patients who received care at facilities that used only urgent care clinic codes during the study period were excluded because these facilities lack medical-surgical beds and/or an intensive care unit, which affects the emergency care that can be provided there.[1] For the remaining facilities, ED and urgent care clinic were considered together because of variation in coding practices (ie, some VAMCs use separate codes for ED and urgent care clinic and some do not). The sample was limited to previous VA users

because patients who are new to the VA can initiate contact with the system through the ED; therefore, their visit may not be associated with an acute illness or injury. As a final step, we randomly sampled 20% of veterans from each eligible VAMC ED who met the above criteria. This sampling strategy was used to maintain the feasibility of analyses while ensuring patient representation from all eligible VAMC EDs.

Measurements

Emergency Department Disposition.—Possible disposition paths at the end of the index ED visit were (1) treated and released, (2) hospital admission, or (3) died in the ED. Patients were considered to have been treated and released if there was no record of a hospital admission within 1 day of their ED visit. Patients who died on the same date as their ED visit, but did not have a record of hospital admission, were considered to have died in the ED.

Dependent Variables.—The main dependent variables of interest were ED visits and hospital admissions within 30 days of the index ED visit. These were considered separately because previous data demonstrated that risk factors differ for these 2 outcomes.[13] To avoid doublecounting events, an ED visit followed by a hospitalization (within 1 day) was considered a hospitalization only.[14] Multiple ED codes on the same date of service were considered as 1 visit.

Independent Variables.—To identify predictors of our primary outcomes, we used the behavioral model of healthcare utilization which considers predisposing, enabling, and need variables.[15,16] Predisposing characteristics included age (55 or <55 years), sex, race (African American/non–African American/unknown or missing), and marital status (unmarried or other). Age as a continuous variable violated the linearity assumption of the analysis model; therefore, age was dichotomized at 55 years after visual inspection of the relationship between age and outcomes.[17] Enabling resources included income *(*copay exempt due to low income or other), home- less (yes or no), and uninsured (yes or no). Homelessness was defined as receiving VA care related to homelessness in the previous year, according to clinic codes (528, 529, or 590) or diagnosis codes (V60.0 and V60.1). Need variables included comorbidity (Diagnostic Cost Group score), service-connected disability (>50% or other), treat-and-release ED visits within the previous 180 days (yes or no), hospital admissions within the previous 180 days (yes or no), 5 or more primary care provider (PCP) visits in the previous year, and use of Aid and Attendance benefits. Diagnostic Cost Group score was calculated using diagnoses from both inpatient and out-patient files in the previous fiscal year. Diagnostic Cost Group scores have been shown to predict hospitalization and mortality among veterans as well as other comorbidity scores.[18,19] Aid and Attendance benefits are available to veterans with severe functional impairments that necessitate regular assistance from another person in the veteran's home.[20] Index ED visit characteristics included day of visit (weekend or weekday) and facility location (Northeast, South, Midwest, West). Using previously described methods,[21] 4 ED discharge diagnosis groups were identified (injury/musculoskeletal, chronic condition, infection, non-musculoskeletal symptoms). Emergency department discharge diagnosis and

geographic region variables were coded using effect coding (ie, the mean of the means of the groups was used as the reference instead of 1 of the groups).[22,23]

Analysis

Descriptive statistics were used to characterize the patient sample. Generalized estimating equations were used to examine the influence of patient and ED visit factors on outcomes. The first equation predicted repeat treat-and- release ED visits, and the second equation predicted hospital admission within 30 days of the index visit. Multivariable models included only subjects who survived through the 30-day observation period. Candidate patient variables (selected a priori according to the Andersen model) and ED visit variables were entered into the model simultaneously. A variable was considered significant if $P<.05$ after adjustment for variables already in the model. After assessing model fit and checking for collinearity among independent variables, a C statistic was calculated to evaluate concordance between predicted and observed outcomes (ie, how well the model predicted outcomes).[24] Results from the generalized estimating equation models were expressed as odds ratios (ORs) and 95% confidence intervals (CIs). All analyses were performed at the patient level with adjustment for clustering of patients within facilities; an intraclass correlation coefficient was calculated to estimate the effects of clustering of patients within facilities. Analyses were conducted using SAS version 9.1 (SAS Institute, Inc, Cary, North Carolina).

RESULTS

Sample Construction and Characteristics

A total of 765,732 unique patients had 1 or more visits to a VAMC ED during the 9-month observation period. After excluding patients without VA use in the previous year (n = 90,051) and those seen at a facility that used only urgent care clinic codes (n = 26,144), 649,537 eligible veterans remained. From these patients, a random 20% sample was drawn from each of 102 VAMCs. In our final sample of 128,174 individuals, 102,516 (80%) were treated and released, 25,630 (20%) were admitted to the hospital, and 28 (0.02%) died in the ED. Subsequent analyses focused on the 102,516 veterans who were treated and released. The mean age of this predominantly male sample was 58.7 years. As shown in Table 1, more than 1 in 3 patients had low income (39.4%) and 5.6% used VA services designed for the homeless. On average, patients had seen their PCP on 4 occasions in the year prior to the index ED visit. Twenty-three percent of ED visits were related to injuries or acute musculoskeletal conditions, and 21% were related to chronic medical conditions.

Frequency of Repeat Emergency Department Visits, Hospitalizations, and Deaths

Overall, 19.3% of veterans who were treated and released at their index ED visit had 1 or more of the following events within 30 days: repeat ED visit, hospitalization, or death. A total of 15,647 veterans (15.3%) had a repeat ED visit (total of 19,791 visits), 5117 veterans (5.0%) were hospitalized, and 399 veterans (0.4%) died. The times to first repeat ED visit and hospital admission both followed a similar pattern, with a higher frequency of events occurring during the first 7 days (Figure).

Risk Factors for Repeat Emergency Department Visits

Patient- and visit-level predictors of repeat ED visits with- in 30 days are presented in Table 2. Being unmarried, having a higher comorbidity burden, having a service-connected disability, and having 5 or more PCP visits in the previous year were associated with small but significantly increased odds of repeat ED visits. The odds of a repeat ED visit were significantly higher for patients who were homeless (OR 1.70; 95% CI 1.59, 1.82), had a previous ED visit (OR 1.66; 95% CI 1.58, 1.74), or had a previous hospital admission (OR 1.28; 95% CI 1.22, 1.35). Emergency department visits that occurred on the weekend, those related to infection, and those that occurred in VAMCs in the West were also associated with increased odds of repeat visits, although the magnitude of the association was modest.

Risk Factors for Hospitalization

As shown in Table 3, older age was associated with in- creased odds of subsequent hospitalization (OR 1.35; 95% CI 1.26, 1.46). Small but statistically significant associations were also observed with being unmarried, having low income, having a service-connected disability, having a previous ED visit, and having 5 or more PCP visits in the previous year. As was the case with repeat ED visits, stronger effects were observed with predictors in the enabling and need categories. Increased odds of hospitalization were associated with being homeless (OR 1.61; 95% CI 1.44, 1.80), having greater medical comorbidity (OR 1.31; 95% CI 1.27, 1.34), and the presence of functional impairments as measured by receipt of Aid and Attendance benefits (OR 1.54; 95% CI 1.35, 1.76). The strongest predictor of subsequent hospital admission was having been hospitalized in the previous 6 months (OR 2.48; 95% CI 2.28, 2.76). Weekend ED visits were associated with higher odds of hospital admission within the subsequent 30 days (OR 1.09; 95% CI 1.02, 1.17). Index ED visits related to injuries/acute musculoskeletal conditions, infections, and unclassified diagnoses were less likely to be associated with a subsequent hospitalization, while initial ED visits related to non-musculoskeletal symptoms and chronic conditions were associated with higher odds of hospital admission within the next 30 days.

Follow-up Appointments With Outpatient Providers

Table 4 displays the relationship between other types of outpatient care and repeat ED visits, hospital admission, or death within 30 days. There were no intervening outpatient visits for 72% of patients with a repeat ED visit and for 55% of patients who were subsequently hospitalized.

DISCUSSION

Emergency care is an important, but understudied, part of the continuum of services offered to veterans by the VHA. This study is the first to report national VAMC ED disposition rates and to provide a detailed description of veterans who were treated and released from VAMC EDs. These data contribute to a better understanding of the population served in VAMC EDs, which is needed for VHA planning of quality-of-care assessments and resource allocation. This study also provides new information about the frequency and predictors of unscheduled health service use among veterans after an index ED visit. Al-though the patients served by the VA differ from those receiving care in other health systems, the

current study's findings can also inform the discussion under way in the United States about accountable care organizations as a means to achieve improvements in quality while reducing the rate of spending growth.[25] The VA already embodies many of the core principles of accountable care organizations as an integrated delivery sys- tem with an advanced information technology infrastructure and a strong primary care base, yet nearly 1 in 5 veterans in this study treated in a VAMC ED sought additional unscheduled ED or hospital care within 30 days.

The hospital admission rate at the index ED visit in this study was 20%, which is higher than the 12% to 15% admission rate reported among nonfederal EDs nationally.[3,4] This difference may be because our sample did not included children, an age group with lower hospital admission rates than adults,[3] and/or because veterans who receive care in VAMCs have higher comorbidity.[9,10] As expected, 80% of ED visits at VAMCs were treat and release. Overall, 46% of these visits occurred in the South, the region with the largest population of veterans in the United States.[26] Homeless persons account for only 0.5% of nonfederal ED visits,[4] but the frequency of homelessness was 10 times higher in this sample of veterans treated and released from VAMC EDs (5.6%). In recent years, the VHA has intensified efforts aimed at preventing and ending homelessness among veterans, and these initiatives may have an effect on ED utilization as more services become available to these veterans in other settings.[27]

In the 30 days following a treat-and-release VA ED visit, about 1 in 7 veterans returned for another unplanned visit to the ED. This rate is higher than the 1 in 10 return rate observed among Medicare patients 65 years or older.[13] It is notable that one of the strongest predictors of repeat ED use was a previous history of receiving acute outpatient care in a VAMC ED. Odds of a repeat treat-and-release ED visit were 66% higher among those with a previous visit of the same type.

Thirty-day hospitalization rates were lower in this study than in a similar sample of Medicare recipients (5% vs 11%).[13] Many of the factors strongly associated with subsequent hospital use were indicative of a higher level of medical need in this population, such as higher burden of comorbidity, severe functional impairments, and previous hospital admission. However, homelessness also emerged as a predictor of both repeat ED visits and hospital admission. Approximately 9% of all the veterans who returned within 30 days of their original visit were homeless. Homeless veterans can face challenges with obtaining needed medications, arranging care with outpatient providers, and securing transportation to and from follow-up appointments—all of which may contribute to higher risk for returning to the ED. Other factors that may contribute to a higher return rate in this population include the severity of underlying illnesses in many homeless individuals as well as lack of social support.

These data underscore the fact that EDs provide a significant amount of outpatient care in the VA system. Although the ED is undoubtedly an important portal of entry into the hospital, the majority of patient visits did not result in admission. In non-VA settings, it has been suggested that EDs are often used for primary care, particularly among patients with limited access to alternative care sites.[4] Veterans in this sample had visited their PCP an

average of 4 times in the previous year, so lack of access to non-ED ambulatory care providers would seem to be an incomplete explanation for the high repeat visit rate we observed. Certainly, veterans' "after-hours" needs drive some ED utilization. In this study, 20% of ED visits occurred on the weekend, and a previous study reported that 42% of all VA ED visits occurred after the day shift[2]; these are both times when VA primary care clinics are generally closed. Among the remaining ED visits that occurred during the day on weekdays, it is not known whether patients were unable to contact their PCPs or whether the acuity of their problem made this seem like an imprudent approach. Alternatively, patients may view their PCP as someone they see for routine and preventive care only and the ED as the preferred location for all acute conditions. These questions cannot be addressed in the context of the current study, but are important areas for future research. To improve access and coordination, the VHA is currently implementing the patient-centered medical home in its primary care sites.[28] It will be important to assess whether this practice redesign changes ED use and recidivism.

A final question addressed in this study was how often patients who experienced some type of unscheduled return visit (ED or hospitalization) had seen an outpatient provider in follow-up after their initial ED encounter. Although all patients in our sample were receiving VA care, only 47% had an outpatient visit within 30 days of their ED visit. Notably, fewer than one-third of those who returned to the ED had seen another VA outpatient provider between their original and return ED visits. Together with the risk factors for return visits, these findings highlight the clinical implications of this study: namely, the need for better screening mechanisms to identify veterans at risk for recidivism and improved methods of ensuring prompt follow-up care for those who need it.

Timely follow-up care following hospitalization has been suggested as a potential measure of quality in healthcare organizations.[29] Performance measurement is a central tenet of accountable care organizations[25] and has long had an important role in the VHA health care system.[30] Measuring outpatient follow-up care after an ED visit may have a future role in quality assessment, but more study is required to determine whether early follow-up is associated with improved outcomes. Patients receive outpatient care in EDs for a wide variety of reasons ranging from relatively minor injuries to exacerbations of chronic diseases such as heart failure, and it is unlikely that all patients would benefit equally from early follow-up.

There are a number of study limitations that merit acknowledgment. First, our estimates of utilization are conservative because we lack data on non-VA services. However, our sample of veterans had evidence of high VA outpatient utilization prior to the index ED visit, suggesting that they were likely engaged enough to view the VA as their primary source of healthcare. Second, VA administrative data have limitations such as missing values for race.[31] Administrative data also lack detailed clinical information; for example, we cannot ascertain the severity of the problem that led to the ED visit, which may influence the frequency of recidivism. We defined homelessness as having received VA care related to homelessness in the previous year. While we believe this definition accurately reflects a population with vulnerability in regard to their housing situation, we cannot be certain that these veterans were homeless at the time of their ED visit. Also, this definition does not

capture individuals who were in fact homeless, but had not received any VA care related to homelessness. Finally, although the sample was drawn to be representative of VA care nationally, our results may not be generalizable to the US population as a whole, particularly given the facts that the majority of the sample members were men and that veterans have been observed to have more complex chronic conditions.[9,10]

In summary, the majority of veterans evaluated in VAMC EDs are treated and released; however, a substantial proportion of these veterans return to the ED or are admitted to the hospital within 30 days. The risk of return visits was particularly high among patients with previous use, medical need, and homelessness. Further study is needed to examine whether efforts to improve risk assessment and follow-up care can reduce recidivism rates in this population.

Acknowledgment

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Take-Away Points

This study examined emergency department (ED) visits in the Veterans Affairs (VA) system.

- The majority of VA ED visits resulted in patients being treated and released, rather than admitted to the hospital.

- In the 30 days following a treat-and-release VA ED visit, about 1 in 7 veterans returned for another unplanned visit to the ED. The risk of return was higher among homeless veterans and those with previous ED use.

- Among veterans who returned to the ED, nearly three-fourths had not seen another VA outpatient provider between their original and return ED visits.
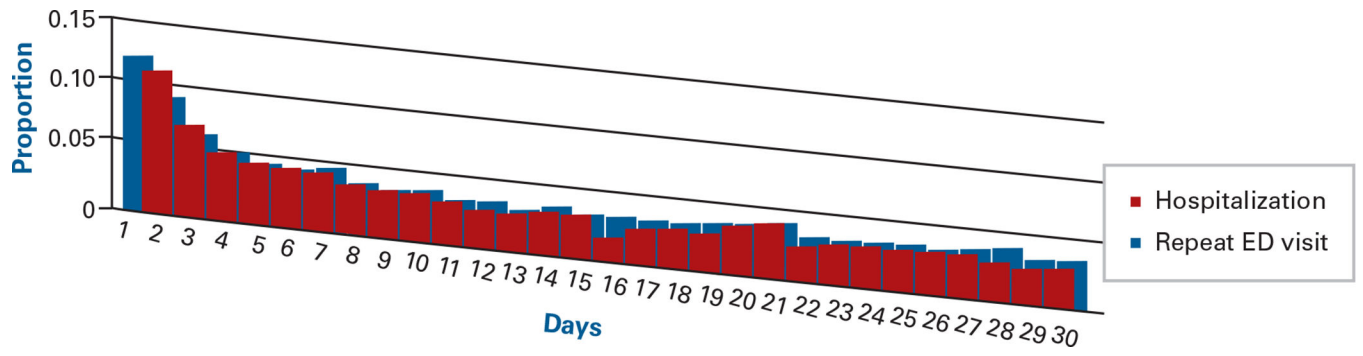
Figure.

Distribution of Days From Index Emergency Department Visit to First Repeat Emergency Department Visitor Hospitalization[a]

Table 1.

Patient and Emergency Department Visit Characteristics (N = 102,516)[a]

Patient and ED Visit Characteristics	Value
Patient characteristics	
Age 55 y	64.1
Female	8.0
African American race	19.0
Unknown/missing race	27.8
Unmarried	54.6
Low income (copay exempt)	39.4
Homeless[b]	5.6
Uninsured	54.8
Comorbidity score[c]	
0 (lowest)	68.5
1	20.0
2	5.2
3 or greater	2.6
50% or more service-connected disability	24.2
ED visit in 180 days preceding index ED visit	15.6
Hospital admission in 180 days preceding index ED visit	9.3
Number of PCP visits in 12 months preceding index ED visit, mean (SD)	4.0 (4.0)
Receiving Aid and Attendance benefits[d]	2.0
Index ED visit characteristics	
Weekend	19.6
Discharge diagnosis category[e]	
Injury/acute musculoskeletal	22.5
Chronic medical condition	20.7
Non-musculoskeletal symptoms	13.7
Infection	15.6
Facility l ocation	
Northeast	13. 6
South	45.6
Midwest	19.3
West	21.5

ED indicates emergency department.

[a] Values are percentages unless indicated otherwise.

[b] Homelessness was defined by receipt of VA care related to homelessness in the previous year, according to clinic codes (528, 529, or 590) or diagnosis codes (V60.0 and V60.1).

[c] According to Diagnostic Cost Group score.

[d] Indicates severe functional impairment.

[e]Remainder were unclassified.

Table 2.

Predictors of Repeat Emergency Department Visits [a]

Predictor	Patients Without a Repeat ED Visit (n = 86,521)	Patients With a Repeat ED Visit (n = 15,596)	Adjusted Odds Ratio (95% CI) (n = 97,323) [b]
Patient predisposing characteristics			
Age ≥ 55 y	64.1	62.9	0.96 (0.93, 0.99)
Female	8.1	1.8	0.94 (0.89, 1.01)
African American race	18.6	20.9	1.05 (0.99, 1.11)
Unknown/missing race	28.2	25.4	0.92 (0.88, 0.97)
Unmarried	54.4	58.3	1.09 (1.05, 1.13)
Enabling resources			
Low income	38.9	41.3	1.04 (0.99, 1.09)
Homeless	4.9	9.4	1.70 (1.59, 1.82)
Uninsured	54.7	56.0	1.02 (0.98, 1.06)
Need characteristics			
Comorbidity score, mean (SD) [c]	0.8 (0.9)	1.0 (1.0)	1.07 (1.05, 1.09)
50% or more service-connected disability	24.1	24.7	1.06 (1.01, 1.11)
ED visit in previous 180 days	14.3	23.3	1.66 (1.58, 1.74)
Hospital admission in previous 180 days	8.6	12.9	1.28 (1.22, 1.35)
5 primary care provider visits in previous year	30.5	35.0	1.15 (1.10, 1.20)
Aid and Attendance benefits [d]	1.9	2.3	1.08 (0.97, 1.20)
Index ED visit characteristics			
Weekend visit	19.3	21.3	1.15 (1.10, 1.20)
Discharge diagnosis category			
Injury/acute musculoskeletal	22.5	22.6	1.01 (0.97, 1.05)
Chronic condition	20.7	20.4	0.96 (0.92, 1.00)
Non-musculoskeletal symptoms	15.6	15.1	0.97 (0.93, 1.01)
Infection	13.4	15.4	1.14 (1.09, 1.19)
Unclassified	27.7	26.4	0.93 (0.90, 0.97)
Facility location			

Predictor	Patients Without a Repeat ED Visit (n = 86,521)	Patients With a Repeat ED Visit (n = 15,596)	Adjusted Odds Ratio (95% CI) (n = 97,323)[b]
Northeast	13.7	13.3	0.96 (0.89, 1.02)
South	45.7	44.7	0.97 (0.91,1.03)
Midwest	19.4	19.0	0.99 (0.92, 1.06)
West	21.2	23.0	1.10 (1.02, 1.17)

CI indicates confidence interval; ED, emergency department.

[a]Values are percentages unless indicated otherwise. Facility intraclass correlation coefficient = 0.004; C = 0.58.

[b]Model sample size reduced due to case deletions for missing data.

[c]According to Diagnostic Cost Groups score.

[d]Indicates severe functional impairment.

Table 3.

Predictors of Hospital Admission After a Treat-and-Release Emergency Department Visit[a]

Predictor	Patients Without a Hospital Admission (n = 97,159)	Patients With a Hospital Admission (n = 4958)	Adjusted Odds Ratio (95% CI) (n = 97,323)[b]
Patient predisposing characteristics			
Age ≥55 y	63.4	74.2	1.35 (1.26, 1.46)
Female	8.2	5.7	0.91 (0.84, 0.99)
African American race	19.1	175	0.84 (0.78, 0.92)
Unknown/missing race	27.9	25.1	0.91 (0.84, 0.99)
Unmarried	54.8	58.8	1.18 (1.10, 1.25)
Enabling resources			
Low income	39.0	45.7	1.20 (1.11, 1.29)
Homeless	5.4	9.6	1.61 (1.44, 1.80)
Uninsured	55.2	49.2	0.94 (0.88, 1.00)
Need characteristics			
Comorbidity score, mean (SD)[c]	0.8 (0.8)	1.4 (1.3)	1.31 (1.27 1.34)
50% or more service-connected disability	24.1	25.6	1.14 (1.06, 1.24)
ED visit in previous 180 days	15.3	21.4	1.10 (1.02, 1.20)
Hospital admission in previous 180 days	8.4	26.2	2.48 (2.28, 2.70)
5 primary care visits previous year	30.6	41.8	1.18 (1.11, 1.25)
Aid and Attendance benefits[d]	1.8	4.8	1.54 (1.35, 1.76)
Index ED visit characteristics			
Weekend visit	19.5	20.7	1.09 (1.02, 1.17)
Primary discharge diagnosis			
Injury/acute musculoskeletal	22.8	177	0.87 (0.82, 0.92)
Chronic condition	20.3	28.2	1.30 (1.23, 1.37)
Non-musculoskeletal symptoms	15.4	18.3	1.16 (1.08, 1.24)
Infection	13.9	11.2	0.87 (0.80, 0.94)
Unclassified	27.7	24.5	0.88 (0.84, 0.93)
Facility l ocation			
Northeast	13.6	13.6	0.998 (.89, 1.12)

Predictor	Patients Without a Hospital Admission (n = 97,159)	Patients With a Hospital Admission (n = 4958)	Adjusted Odds Ratio (95% CI) (n = 97,323)[b]
South	45.6	45.7	1.01 (0.95, 1.07)
Midwest	19.3	20.0	1.02 (0.94, 1.10)
West	21.5	20.7	0.97 (0.89, 1.06)

CI indicates confidence interval; ED, emergency department.

[a]Values are percentages unless indicated otherwise. Facility intraclass correlation coefficient = 0.001; C = 0.69.

[b]Model sample size reduced due to case deletions for missing data.

[c]According to Diagnostic Cost Groups score.

[d]Indicates severe functional impairment.

Table 4.

Relationship Between Other Outpatient Care and Repeat Emergency Department Visit, Hospital Admission, or Death Within 30 Days After Emergency Department Discharge

Other Outpatient Care Preceding First Event	First Event in 30-Day Follow-up Period, %		
	Repeat ED Visit (n = 15,263)	Hospital Admission (n = 4290)	Death (n = 209)
PCP visit	13.8	18.6	13.4
Specialty care visit	14.7	30.1	17.2
Mental health visit	8.8	10.5	5.7
Any non-ED outpatient care (PCP specialty care, or mental health)	28.3	45.4	29.7

ED indicates emergency department; PCP, primary care provider.