

Patients' Needs Following Emergency Care for Ambulatory Care–Sensitive Conditions

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Poor coordination across care transitions leads to adverse clinical outcomes, inefficient care, and less favorable patient experiences.¹⁻⁷ The treat-and-release emergency department (ED) visit, in which a patient is discharged from the ED to home or to a skilled nursing facility, is an example of a transition vulnerable to poor outcomes. Across the United States, there are approximately 140 million ED visits each year, 80% of which are treat-and-release visits; of these, 88% have follow-up care recommendations or referrals.⁸ Patients who do not receive follow-up care or have unmet needs after ED visits are at higher risk for unfavorable clinical outcomes, including ED revisits and hospitalizations.⁹⁻¹⁵

Despite this risk for poor outcomes, there has been relative underinvestment in both research and implementation of practices to support communication and care coordination for treat-and-release ED visits. In 2017, a National Quality Forum panel assessed the current state of the science on this issue and concluded that investment is needed in developing new infrastructure and linkages to support communications and coordination following treat-and-release ED visits.⁹ The report further concludes that research is needed for understanding which patients are at highest risk for encountering problems across this transition.

Veterans, who on average are older and have more complex medical histories than nonveterans, are at particularly high risk for post-ED adverse outcomes¹⁶ and thus are an important patient population to focus on when assessing the post-ED transition. These risks may be even higher for veterans presenting to the ED with chronic ambulatory care–sensitive conditions (ACSCs), which include asthma, chronic obstructive pulmonary disease (COPD), heart failure, diabetes, and hypertension. Timely outpatient care has been shown to prevent adverse outcomes among patients with chronic ACSCs.¹⁷ In addition, management of chronic ACSCs is dependent on medications, and medication changes across transitions are a well-documented source of medical errors.^{3,18}

Therefore, in patients with treat-and-release ED visits for chronic ACSCs, it is important to have clear understanding of the prevalence and types of ED medication changes and of post-ED care needs they

ABSTRACT

OBJECTIVES: Poor coordination across care transitions for patients with chronic ambulatory care–sensitive conditions (ACSCs) leads to adverse clinical outcomes. Veterans are at high risk for post–emergency department (ED) adverse outcomes, but the care needs of patients leaving the ED after “treat-and-release” visits are poorly characterized. To inform intervention development and implementation, we assessed for medication changes and follow-up care needs among patients with treat-and-release Veterans Affairs (VA) ED visits for chronic ACSCs.

STUDY DESIGN: Retrospective, observational study.

METHODS: We identified treat-and-release ED visits at the Greater Los Angeles VA (10/1/2017–6/30/2018) with diagnostic codes (in any position) for the ACSCs of asthma, chronic obstructive pulmonary disease, heart failure, diabetes, and/or hypertension. For 249 randomly selected visits, a trained nurse abstractor reviewed the ED notes using a structured abstraction tool.

RESULTS: Most of the patients (91%) were male; the median (IQR) age was 67 (58–73) years. In 128 (51%) visits, a medication change was recommended; a new medication was prescribed in 109 (44%), changed in 24 (10%), and stopped in 7 (3%) visits. One or more follow-up care needs were specified in 165 (66%) visits; 55 (22%) specified 2 needs, and 13 (5%) specified 3 or more needs. The 2 most common follow-up care needs were symptom check (41%) and potential medication adjustments post ED (21%).

CONCLUSIONS: More than half of patients with treat-and-release ED visits for chronic ACSCs have recommended medication changes, and two-thirds have at least 1 follow-up care need. This information offers potential foci for testing interventions to improve care coordination for patients with ACSCs who are released from the ED.

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may have—both to characterize these patients' level of risk and to inform efforts to design and build infrastructure and linkages that improve communication and care coordination, and thereby patient safety and outcomes, after ED visits for all patients. Thus, we assessed for medication changes and follow-up care needs among patients with treat-and-release Veterans Affairs (VA) ED visits for chronic ACSCs.

METHODS

Using administrative data from VA's Corporate Data Warehouse, we identified 684 treat-and-release visits to the VA Greater Los Angeles (GLA) ED between October 1, 2017, and June 30, 2018, with an *International Classification of Diseases, Tenth Revision (ICD-10)* code (in any diagnostic position) indicating a chronic ACSC (J44 [COPD], J45 [asthma], I50 [heart failure], E08-E13 [diabetes], I10-I11 [hypertension]). Of these, 300 visits were randomly selected, and for each, a trained registered nurse abstractor (K.A.) reviewed all ED physician and nurse notes, including written discharge instructions. A physician researcher (K.M.C.) reviewed the notes and abstracted information for the initial 50 visits to ensure concordance, providing feedback and additional training as needed, and then answered clarifying questions as they arose in the course of abstracting the remaining 250 visits. For visits that were confirmed to be in person and for an ACSC, we abstracted information about changes to patients' medications and ED provider recommendations for specific follow-up care using a structured electronic tool with branching logic; this was created using Research Electronic Data Capture (REDCap).¹⁹ The tool prompted the abstractor to capture all ED provider recommendations for starting, stopping, or changing the dose or frequency of a medication. For follow-up care, the abstractor was prompted to capture recommendations for post-ED symptom checks; laboratory, radiology, or other tests; blood pressure or weight measurements; potential medication adjustments; follow-up appointments with primary care or medical, surgical, or mental health specialists; and other follow-up care needs. We tabulated medication and follow-up care recommendations, across

TAKEAWAY POINTS

To inform intervention development, we assessed for medication changes and patient care needs following treat-and-release Veterans Affairs (VA) emergency department (ED) visits for chronic ambulatory care-sensitive conditions (ACSCs).

- ▶ More than half of patients discharged home from VA EDs with chronic ACSCs (asthma, chronic obstructive pulmonary disease, heart failure, diabetes, hypertension) have been directed to start, stop, or change the dose of their medications; two-thirds have recommendations for follow-up care (eg, symptom or sign reassessment, laboratory tests).
- ▶ Most, although not all, of these post-ED care needs can be met by primary care, and many could be met through virtual care mechanisms.
- ▶ This information is critical for guiding design and implementation of infrastructure and linkages for ED follow-up care coordination interventions that optimize patient safety and outcomes in the VA and other integrated health care systems.

and within each chronic ACSC condition, using Stata version 15 (StataCorp). This work was determined to be nonresearch by the GLA Institutional Review Board.

RESULTS

Over 9 months, there were 684 treat-and-release ED visits assigned a chronic ACSC *ICD-10* code. Of 300 randomly selected visits, we excluded 3 (1%) that were by telephone only and 48 (16%) for which the ED notes did not indicate that the visit included care for a chronic ACSC (ie, the *ICD-10* code appeared to be erroneous). The remaining 249 visits were made by 222 unique patients; 12 patients had 2 included visits, and 4 patients had 3 or more. Patients had a median (IQR) age of 67 (58-73) years; 203 (91%) were men. Across visits, 40 (16%) were for asthma; 73 (29%), COPD; 45 (18%), diabetes; 17 (7%), heart failure; and 88 (35%), hypertension. (Percentages add to 105% because in 14 [6%] visits, care was provided for 2 ACSCs.) In 97 (39%) visits, care for a non-ACSC was also provided.

As shown in **Table 1**, in 128 (51%) of ED visits, a medication change was recommended, with 108 (44%) visits having 1 or more new medications started, 24 (10%) having a medication dose or frequency changed, and 7 (3%) having a medication stopped. Medication changes were most common in visits for COPD, with 68 (93%) of visits resulting in a recommendation for a medication to be started, changed, or stopped. More than half of visits for asthma (n = 22; 55%) and heart failure (n = 9; 53%), and more than a quarter

TABLE 1. Prevalence of Medication Changes Made for Treat-and-Release ACSC Emergency Department Visits

	Asthma visits (n = 40)	COPD visits (n = 73)	Diabetes visits (n = 46)	Heart failure visits (n = 17)	Hypertension visits (n = 88)	All ACSC visits (n = 249)*
Started new medication	21 (53%)	67 (92%)	9 (20%)	4 (24%)	14 (16%)	108 (44%)
Medication dose or frequency changed	1 (3%)	4 (6%)	4 (9%)	5 (29%)	12 (13%)	24 (10%)
Medication stopped	0	4 (6%)	2 (4%)	0	1 (1%)	7 (3%)
Any medication change	22 (55%)	68 (93%)	13 (28%)	9 (53%)	23 (26%)	128 (51%)

ACSC, ambulatory care-sensitive condition; COPD, chronic obstructive pulmonary disease.

*14 visits were for 2 conditions.

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TABLE 2. Prevalence of Specific Post-ED Care Needs, Across Treat-and-Release ACSC ED Visits

	Asthma visits (n = 40)	COPD visits (n = 73)	Diabetes visits (n = 46)	Heart failure visits (n = 17)	Hypertension visits (n = 88)	All ACSC visits (n = 249) ^a
Symptom check	22 (55%)	43 (59%)	15 (33%)	6 (35%)	21 (24%)	101 (41%)
Medication adjustment	2 (5%)	8 (11%)	12 (26%)	5 (29%)	28 (32%)	53 (21%)
Blood pressure measurement	0	0	1 (2%)	0	33 (38%)	33 (13%)
Medical/surgical specialty care	1 (3%)	6 (8%)	7 (15%)	4 (24%)	1 (1%)	17 (7%)
Laboratory test ^b	0	2 (3%)	6 (13%)	0	4 (5%)	12 (5%)
Social work services ^c	1 (2%)	4 (5%)	1 (2%)	0	4 (5%)	10 (4%)
Radiology test ^b	0	6 (8%)	0	0	1 (1%)	7 (3%)
Specialized testing ^d	2 (5%)	2 (3%)	0	0	2 (2%)	6 (2%)
Mental health care	0	2 (3%)	0	0	2 (2%)	4 (2%)
Nutrition counseling	0	0	1 (2%)	0	1 (1%)	2 (1%)
Weight measurement	0	0	0	1 (6%)	0	1 (1%)
Any care need	23 (58%)	51 (70%)	31 (67%)	12 (71%)	58 (66%)	165 (66%)

ACSC, ambulatory care-sensitive condition; COPD, chronic obstructive pulmonary disease; ED, emergency department.

^a14 visits were for 2 conditions.

^bNeeded to be performed, or result followed up.

^cFor example, housing services.

^dFor example, heart, pulmonary, or sleep studies.

of visits for diabetes (n=13; 28%) and hypertension (n=23; 26%), had a recommended medication change.

With respect to follow-up care recommendations, shown in **Table 2**, 165 (66%) of the chronic ACSC visits had 1 or more follow-up care needs; 55 (22%) visits specified 2 needs and 13 (5%) specified 3 or more needs. The 2 most common follow-up care needs were symptom checks (n=101; 41%) and post-ED potential medication adjustments (n=53; 21%). Other follow-up care needs included blood pressure measurements (n=33; 13%), medical/surgical specialty care (n=17; 7%), laboratory tests or results (n=12; 5%), social work services (n=10; 4%), radiology tests (n=7; 3%), specialized testing (eg, heart, pulmonary, or sleep studies) (n=6; 2%), mental health care (n=4; 2%), nutrition counseling (n=2; 1%), and weight measurement (n=1; 1%). Details on the types of medical/surgical specialty care, laboratory tests or results, radiology tests, and specialized testing follow-up care needs are shown in the **eAppendix** (available at ajmc.com). Most social work services (captured in the “other” follow-up recommendation category on the REDCap form) centered around housing support services. Heart failure visits had the highest likelihood of having 1 or more follow-up care needs (71%), followed closely by COPD (70%), hypertension (68%), diabetes (67%), and asthma (58%) visits.

DISCUSSION

Among patients with treat-and-release VA ED visits for chronic ACSCs, more than half have recommended medication changes and two-thirds have primary care, specialty care, and/or social work follow-up care needs. Not uncommonly, patients have multiple follow-up care needs after chronic ACSC ED visits. These findings

demonstrate the extent to which patients with ED visits for chronic ACSCs are at high risk for encountering problems across the post-ED care transition.

The high prevalence of ED provider recommendations for medication changes points to an area of particular vulnerability for miscommunication and potential safety concerns. These medication changes need to be effectively communicated to patients, their caregivers, and their primary and specialty care providers. Infrastructure is needed to support all medication changes being clearly specified in transition records and in any other forms of asynchronous communications between ED and follow-up care providers.²⁰ Further, although studies have shown that medication errors and unintentional discrepancies are common following hospital discharge,²¹ with determinants spanning both patient and system factors,²² similar research is needed to assess the prevalence, as well as determinants and mitigators, of these problems following ED visits.

In addition, the high prevalence of medication changes suggests the potential value of integrating clinical pharmacy services within EDs to support optimal medication reconciliation, prescribing, and patient medication education.^{23,24} Communication issues between providers and patients about medications are a source of avoidable adverse events. Studies show that pharmacy-led medication reconciliation in the ED decreases medication discrepancies and potential adverse drug events.²⁴ Pharmacist involvement in transitions for complex patients decreases posthospital readmissions and ED visits.²⁵ The extent to which pharmacist involvement in the ED could similarly prevent ED revisits, as well as post-ED medication errors and unintentional discrepancies, for patients with chronic ACSCs is a topic for potential future research.

With respect to our finding of the high prevalence of post-ED care needs among patients with chronic ACSCs, clear and complete information about these needs is key for lessening patient anxiety and uncertainty; decreasing risk of adverse outcomes, including ED revisits, hospitalizations, and death; and optimizing use of health care resources.⁹⁻¹⁵ Patient-centered medical homes, including VA's Patient Aligned Care Teams (PACTs), are designed to facilitate care coordination and communication across transitions²⁶ and should play an integral role in interventions to improve receipt of needed post-ED follow-up care. However, although primary care can meet most of the needs detailed in our findings, some needs, such as specialty care and specialized testing, will necessitate coordinating with other services. Of note, many of these needs could potentially be met virtually (eg, a telephone/video visit for symptom checks, the most prevalent need).

The VA has initiated developing and implementing evidence-based interventions to ensure that patients get the care they need following VA ED visits.^{27,28} The ED-PACT Tool facilitates communication between ED providers and PACT staff, using messages sent via the VA electronic health record.²⁷ Separately, the ED-Rapid Access Clinics initiative enables VA EDs to directly schedule appointments for specialty follow-up care²⁸; multiple studies have shown that direct scheduling improves the receipt of post-ED care.²⁹ For instance, the results of a research study by Hastings and colleagues—the VA Discharge Information and Support for Patients receiving Outpatient care in the Emergency Department—showed that among high-risk veterans with chronic health conditions, post-ED structured telephone support can increase the rate of having at least 1 primary care visit within 30 days of a VA ED visit.³⁰ Further work is needed to investigate the effects of these innovations on patient experience and outcomes, assess their implementation, promote their spread across VA, and consider how they might be adapted for veterans using non-VA EDs.²⁰ Similar interventions are also needed within integrated care systems beyond VA.⁹

Limitations

The most salient limitation of this work is that it was performed in a single VA facility. Future work should assess for similarities and differences in patients' ACSC follow-up care needs across VA EDs and assess transitions after treat-and-release ED visits in other systems of care. Descriptions of follow-up care needs in patients presenting to VA EDs with other conditions, and to non-VA EDs, are also needed. An additional limitation in our methods is that although a second individual reviewed the initial 50 visits to ensure abstraction consistency and accuracy, we did not utilize a second reviewer in a way that allows calculation of interrater reliability. Finally, we included visits with ACSCs that had ICD-10 codes in any diagnostic position; ACSC codes not in the primary position indicate that the ACSC was not the main focus of care. Discharge medications and follow-up care needs may differ between those who have an ACSC as a primary vs a nonprimary diagnosis.

CONCLUSIONS

The high prevalence of medication changes and follow-up care needs among patients with treat-and-release VA ED visits for chronic ACSCs suggests a pressing need for communication and care coordination following these visits. Further work is needed to ascertain the status and functioning of post-ED communication and coordination mechanisms across VA, with assessments of whether patients are receiving needed care, the nature of their experiences in obtaining that care, potential variations in care receipt by condition, and need for patient medication reconciliation and education support during and following ED visits. Such work is critical for optimizing patient safety and post-ED outcomes in the VA and in other integrated health care systems. ■

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eAppendix. Types of medical/surgical specialty care laboratory tests or results, radiology tests, and specialized testing follow-up needs, with visit emergency department diagnoses

Medical/surgical specialty care need	Emergency Department Diagnoses
Pulmonary (5 visits)	COPD
Cardiology (4 visits)	Heart Failure (3 visits), diabetes (1 visit)
Pulmonary and Cardiology	Heart Failure
Diabetes/Endocrinology (5 visits)	Diabetes (3 visits), diabetes and hypertension (1 visit), diabetes and COPD (1 visit)
Podiatry	Diabetes and Diabetic foot ulcer
Allergy	Asthma
Laboratory Test/Result Need	Emergency Department Diagnoses
Potassium	COPD, Hyperkalemia
INR	COPD, Atrial Fibrillation
Potassium and Creatinine	Hypertension
Basic Metabolic Panel	Hypertension
Thyroid Stimulating Hormone	Hypertension, Tachycardia
Complete Blood Count	Hypertension, Diabetes, Leukocytosis
Creatinine, Blood cultures*	Diabetes, Urinary Tract Infection, Acute Kidney Injury
Fasting Lipid Panel*	Diabetes
Blood Sugar (2 visits)	Diabetes
“Labs”, Not Otherwise Specified (2 visits)	Diabetes
Radiology Test/Result Need	Emergency Department Diagnoses
Chest X-ray (2 visits)	COPD
Chest Cat Scan (2 visits)	COPD (1 visit); COPD and pulmonary nodule (1 visit)
Renal Artery Ultrasound	Hypertension
Not specified (2 visits)	COPD
Specialized Testing Need	Emergency Department Diagnoses
Cardiac stress test	Asthma
Cardiac stress test, echocardiogram, sleep study	Hypertension, shortness of breath, lower extremity edema
Echocardiogram	Hypertension
Pulmonary function test (4 visits)	Asthma (2 visits); COPD (2 visits)

COPD=Chronic Obstructive Pulmonary Disease; * Follow-up on results of blood test drawn in ED