

# Ambulatory Care–Sensitive Emergency Visits Among Patients With Medical Home Access

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**M**rs Smith, a 50-year-old woman with a history of hypertension, noted redness and pain in her posterior left calf when she awoke in the morning. Over the course of the day, her pain increased and she observed swelling of the left lower extremity. She otherwise felt well, but recalling that her father had similar symptoms due to a blood clot, she presented to the emergency department (ED) at 3 PM for evaluation.

Was it appropriate for Mrs Smith to seek immediate care in the ED? Primary care providers and insurers may disagree. Among providers, Mrs Smith's symptoms raise concern for a deep venous thrombosis (DVT), a potentially life-threatening condition that warrants emergent evaluation. In contrast, insurers use the clinical diagnosis at ED discharge, not the presenting symptoms, to determine whether emergent care was necessary. For example, the ED encounter would be considered appropriate if Mrs Smith was, in fact, found to have a DVT, but it would be considered inappropriate if she was diagnosed with an ambulatory care–sensitive condition (ACSC), such as cellulitis.

ACSCs are a heterogeneous set of acute and chronic conditions for which early and effective management in the primary care setting may prevent an ED encounter.<sup>1</sup> As healthcare spending within the United States continues to rise,<sup>2</sup> decreasing preventable ED encounters has been targeted as a potential means of cost containment.<sup>3</sup> At least one-third of annual ED visits are nonurgent,<sup>4</sup> and management of these cases in alternative settings, such as primary care clinics and urgent care centers, could save an estimated \$4.4 billion per year.<sup>5</sup> Insurers and policy makers consider ambulatory care–sensitive ED encounters to be an indicator of primary care resources within a community, and, increasingly, these encounters are used as a quality metric to guide third-party reimbursement.<sup>6</sup>

Various approaches have been used to improve access to primary care resources and thereby reduce ambulatory care–sensitive ED encounters. The patient-centered medical home (PCMH) model, for example, strives to achieve “accessible, continuous, comprehensive,

## ABSTRACT

**OBJECTIVES:** To characterize patterns of emergency department (ED) utilization for ambulatory care–sensitive conditions (ACSCs) among patients with established care within a patient-centered medical home.

**STUDY DESIGN:** Retrospective chart review using Michigan Medicine's (formerly University of Michigan Health System) electronic health record.

**METHODS:** Ten general medicine (GM) physicians reviewed 256 ambulatory care–sensitive ED encounters that occurred between January 1, 2014, and December 31, 2014, among patients of a GM medical home. Physician reviewers abstracted from the medical record the day and time of ED presentation and the source of ED referral (eg, patient self-referral vs physician referral). Physicians assessed the appropriateness of the care location (eg, ED vs primary care). Interrater reliability was assessed using the kappa statistic, and the  $\chi^2$  test was used to assess differences in the appropriateness of the care location according to ED referral source.

**RESULTS:** Compared with all other days of the week, the fewest number of ED visits occurred on weekend days, and nearly half of patients (48%) presented to the ED after daytime hours, which were defined as 8 AM to 3:59 PM. The majority ( $n = 185$ ; 72%) of patients were self-referred to the ED. The ED was considered the appropriate care location in more than half (53%) of the reviewed cases. Among the 119 cases considered appropriate for GM management, the majority (86%) were self-referred to the ED.

**CONCLUSIONS:** Patients with ACSCs often presented to the ED without contacting their medical home. Frequently, the ED is the most appropriate location given symptoms at presentation.

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## TAKEAWAY POINTS

Among policy makers and insurers, emergency department (ED) encounters for ambulatory care-sensitive conditions (ACSCs) are an indicator of primary care resources and accessibility within a community. The patient-centered medical home model is encouraged as a strategy to improve primary care access and decrease preventable ED encounters. However, this study identified 2 main limitations of this approach:

- ▶ Patients frequently present to the ED for management of an ACSC without first contacting their medical home.
- ▶ Emergent care is often required, given the patient's presenting symptoms, and the ED may be the most appropriate care location.

and coordinated<sup>17</sup> care through strategies such as extended clinic hours (eg, evenings and weekends), individualized care and disease management programs, and multidisciplinary care teams that integrate patients and families.<sup>8</sup> Additionally, urgent care centers,<sup>9</sup> 24/7 physician phone consultation,<sup>10,11</sup> and walk-in clinics in nonmedical facilities, like drug stores, have been implemented to decrease nonurgent ED visits.<sup>12</sup>

Despite these clinical initiatives and national policies<sup>13</sup> that aim to reduce preventable ED visits, little is known about patterns of ED utilization for ACSCs among established PCMH patients. For example, are ambulatory care-sensitive ED encounters more common at certain times of the day? How often do patients initiate primary care contact prior to ED presentation? How frequently is the ED the most appropriate care location given the patient's presenting symptoms? Although others have described ED utilization rates among PCMH patients versus non-PCMH patients,<sup>14,15</sup> these key questions have not been previously addressed. Yet their answers are critical to understanding the medical home's potential effectiveness to reduce ambulatory care-sensitive ED visits. For example, patient-level factors such as convenience,<sup>16,17</sup> perceived medical need,<sup>18</sup> and perceived lack of primary care access<sup>18,19</sup> may drive ED utilization independent of PCMH access. Further, it can be clinically difficult for a provider to assess a condition as urgent or not before in-person evaluation, so immediate evaluation in the ED may be warranted to provide the most patient-centered care.

To study patterns of ED utilization of PCMH patients, we asked general medicine (GM) physicians within our large academic medical center, Michigan Medicine (formerly University of Michigan Health System), to review the records of patients who presented to the ED with an ACSC despite having access to a medical home. These physicians characterized: 1) patterns of ED utilization (eg, day of the week and time of day) among PCMH patients, 2) attempts made by PCMH patients to access their medical home prior to ED presentation, and 3) the appropriateness of the care location (eg, ED vs primary care). This study provides insight into the epidemiology of ambulatory care-sensitive ED visits and may inform future policies and initiatives that aim to reduce these encounters.

## METHODS

The University of Michigan Faculty Group Practice provides physician leadership and project management to the Michigan Primary Care Transformation Project (MiPCT), the largest PCMH initiative in the nation.<sup>20</sup> Reductions in ED and inpatient use for ACSCs are a central goal of this initiative, and, in accordance with national PCMH guidelines, MiPCT offers at least 8 hours of extended access primary care clinic appointments per clinic per week. Specifically, clinics offer a combination of early morning weekday appointments (7 AM to 9 AM), late afternoon weekday appointments (5 PM to 8 PM), and Saturday appointments from 9 AM to 12 PM. We conducted this locally motivated study to help inform national policies and similar primary care initiatives.

## Data Source

Using our institution's electronic health record (EHR) data, we identified ED encounters by GM PCMH patients that occurred between January 1, 2014, and December 31, 2014. We were specifically interested in understanding the interactions that occur between patients and their medical home before ED presentation. Therefore, we limited our selection to include only patients with established primary care, which we defined as at least 2 primary care visits at our institution within 2 years of ED presentation; 1 of these visits must have occurred within 13 months of the ED encounter. We excluded patients who were seen in the psychiatric ED, as mental health diagnoses are independent risk factors for ambulatory care-sensitive ED encounters and reductions in these visits may require specific, targeted interventions.<sup>21</sup> We also excluded patients who were seen in the pediatric ED or our Women's Hospital to focus on ambulatory conditions with a higher probability of having an outpatient GM practice as the appropriate clinical location of care. Finally, we excluded patients with 3 or more ED visits in a year, as they represented a unique subset of patients using the ED and are currently assigned to a case manager in our system.<sup>22</sup>

We limited our results to encounters deemed ambulatory care-sensitive (using the *International Classification of Diseases, Ninth Revision* diagnosis code for Blue Care Network's 2012 list of ACSCs). Our chart selection and exclusion process are detailed in [Figure 1](#).

## Data Abstraction

Ten physicians were involved in this study, and a random 12% sample of eligible patient charts was selected for review (n = 263). The reviewers had access to all clinical information in all settings (notes, labs, radiology, etc) in our integrated EHR. They documented the following information using the Qualtrics survey platform: day of ED presentation; time of ED presentation; reason for visit; ED referral source (eg, GM, subspecialist, patient self-referral), as documented

in telephone and/or clinic and ED notes; patient hospital admission status; need for laboratory testing; and need for advanced imaging, such as computed tomography scan, magnetic resonance imaging, or angiography (plain films were not included, as these would be expected to be readily available in primary care offices). We defined daytime hours as those between 8 AM and 3:59 PM and evening hours as those between 4 PM and 7:59 AM, because clinic appointment schedules are usually full for the day for patients calling after 4 PM for an urgent issue. Finally, physician reviewers were asked to respond to 2 questions: 1) “Was the ED the appropriate care location?” and 2) “Would the case have been more appropriate for management in GM clinic?” If the ED was determined to be the most appropriate care location, physicians were asked to indicate why the case would have been inappropriate for management in the GM clinic.

### Data Analysis

We used the  $\chi^2$  test to assess differences in the relative frequencies of hospitalization and the use of advanced imaging among patients who presented to the ED following GM referral versus patients who presented with the ED without GM referral. Additionally, we used the  $\chi^2$  test to assess differences in the appropriateness of the care location according to ED referral source. A *P* value  $<.05$  was considered statistically significant.

To examine variability in clinical assessments regarding the appropriateness of the care location, 65 (25%) of the 263 charts were reviewed in duplicate, and the Kappa statistic<sup>23</sup> was calculated to assess interrater reliability.

No judgments were made regarding the clinical decision making of the ED providers or the appropriateness of the patient’s final disposition from the ED (ie, hospital admission or discharge).

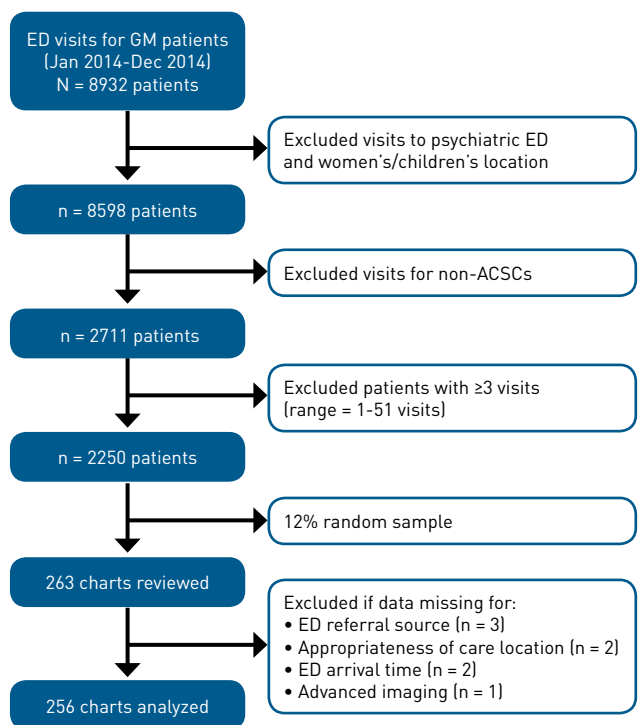
The University of Michigan Institutional Review Board assessed this quality of care study as exempt from review.

## RESULTS

Between January 2014 and December 2014, 2711 established GM patients were seen in our institution’s ED for acute care diagnoses that were classified as ambulatory care–sensitive. Of these, 461 (17%) were identified as high healthcare utilizers based on their having 3 or more ED visits in a year and their charts were excluded from the review process. Of the remaining 2250 patient charts, a random sample of 263 charts was selected for physician review. However, only 256 charts were included in our final analysis, given missing data for 7 charts (Figure 1).

The majority ( $n = 199$ ; 78%) of ED encounters for ACSCs occurred on weekdays, with the greatest number of visits occurring on Friday ( $n = 44$ ; 17%). Compared with all other days of the week, the fewest number of visits occurred on Sunday ( $n = 27$ ; 11%) and Saturday ( $n = 30$ ; 12%) (Figure 2). Nearly half of the patients ( $n = 123$ ; 48%) presented to the ED outside of daytime hours (8 AM to 3:59 PM).

**FIGURE 1.** Selection of Charts for Physician Review



ACSC indicates ambulatory care–sensitive condition; ED, emergency department; GM, general medicine.

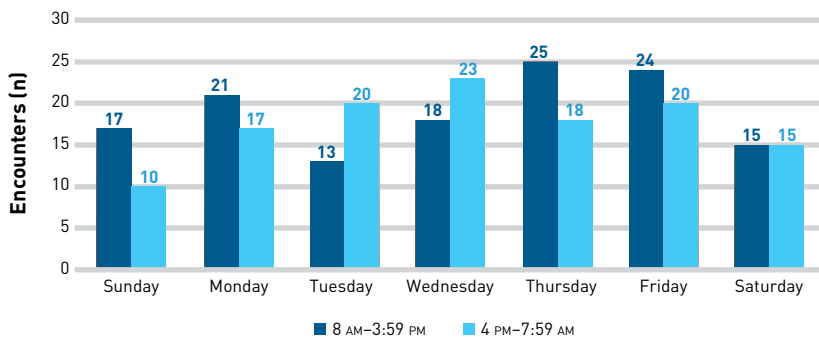
\*Advanced imaging includes computed tomography scan, magnetic resonance imaging, or angiography.

The majority ( $n = 185$ ; 72%) of patients were self-referred to the ED, which was determined by the absence of EHR-documented contact with their primary care medical home or another healthcare provider (eg, a subspecialist or surgeon). Forty-three patients (17%) were referred to the ED by a GM provider; 12 (5%) were sent directly from a primary care clinic visit and 31 (12%) were advised to seek immediate care after contacting the GM clinic. Twenty-three patients (9%) were referred to the ED by a subspecialist, and 5 patients (2%) presented to the ED through other means (eg, police escort or transfer from urgent care).

Most patients ( $n = 217$ ; 85%) were not admitted to the hospital. However, as shown in the Table, the patients referred to the ED by GM ( $n = 43$ ) were significantly more likely to be admitted to the hospital than those who were self-referred to the ED (26% vs 10%;  $P = .01$ ). Similarly, most patients ( $n = 183$ ; 71%) did not receive advanced imaging, but patients referred to the ED by GM were more likely to undergo advanced imaging than those who were self-referred to the ED, although this difference was not statistically significant (40% vs 26%;  $P = .08$ ).

In 53% of the reviewed cases ( $n = 136$ ), physician reviewers indicated that the ED was the most appropriate care location, and

**FIGURE 2.** Day and Time of ED Encounters (N = 256)



ED indicates emergency department.

**TABLE.** Clinical Needs and Physician Assessment of the Appropriateness of the Care Location Among GM-Referred Versus Self-Referred Patients to the ED

	GM-Referred (n = 43)	Self-Referred (n = 185)	P
Clinical needs			
Advanced imaging, <sup>a</sup> n (%)	17 (40)	48 (26)	.08
Hospital admission, n (%)	11 (26)	19 (10)	.01
Appropriateness of care location <sup>b</sup>			
ED appropriate location, <sup>c</sup> n (%)	33 (77)	103 (55)	<.001
GM more appropriate location, <sup>d</sup> n (%)	12 (28)	107 (55)	<.001

ED indicates emergency department; GM, general medicine.

<sup>a</sup>Advanced imaging includes computed tomography scan, magnetic resonance imaging, or angiography.

<sup>b</sup>Columns do not sum to total N because above questions were not mutually exclusive. In several cases, physicians deemed both care locations to be appropriate (eg, urinary symptoms and fever), and in several cases, they deemed neither care location to be appropriate (eg, medication refill that could be handled over the phone).

<sup>c</sup>Physicians answered the question: "Was the ED visit appropriate?"

<sup>d</sup>Physicians answered the question: "Would GM have been more appropriate?"

in 46% of the reviewed cases (n = 119) physician reviewers indicated that GM would have been a more appropriate care location. Of note, there were several instances in which physicians deemed both care locations to be appropriate (eg, urinary symptoms and fever) and several instances in which physicians deemed neither care location to be appropriate (eg, medication refill that could be handled over the phone). Physicians showed moderate agreement (kappa = 0.58) for the question "Was the ED visit appropriate?" and substantial agreement (kappa = 0.68) for the question "Would GM have been more appropriate?"

Physicians cited the following as reasons why GM management would not have been appropriate: acuity of condition (46%), clinic closed (13%), urgent laboratory testing required (4%), advanced imaging required (16%), and other (21%). Among reasons classified as "other," physicians described scenarios where the patient required nonurgent care by a subspecialist (eg, nonurgent dialysis or need for dermatology evaluation) or the patient perceived that

the severity of their condition required emergent care. For example, 1 patient had minor gastrointestinal bleeding that resolved prior to ED presentation and did not require emergent endoscopy. Another patient had recently been discharged from the hospital and believed she was experiencing the symptoms for which she had been instructed to seek emergent care.

Physicians reviewers identified 46% (n = 119) of ambulatory care-sensitive ED encounters as appropriate for the GM clinic. However, most (n = 102; 86%) of these patients were self-referred to the ED; 4% were referred by a subspecialist and 10% were referred by GM. The ED was more often considered the appropriate care location for GM-referred patients compared with self-referred patients (P <.001). The GM clinic was more often considered the appropriate care location for self-referred patients compared with GM-referred patients (P <.001).

## DISCUSSION

*Mrs Smith presented to the ED. A lower extremity Doppler was performed, which did not show evidence of a DVT. She was diagnosed with cellulitis, an ACSC, and she was discharged home with an oral antibiotic after a period of observation in the ED.*

Mrs Smith's case provides a practical and policy-relevant context for interpreting our study's findings. First, some ED visits for ACSCs are warranted. Mrs Smith perceived the potential severity of her condition and appropriately sought emergent care, despite having a regular source of primary care. Second, even with optimized primary care availability and resources within the medical home, patients may still choose to bypass this system and instead seek care in the ED. Third, a condition is deemed "ambulatory care-sensitive" only after a thorough work-up has been completed and potentially life-threatening conditions have been excluded from the clinical differential. Without consideration for the presenting symptoms or circumstantial factors (eg, time of day) that led to the encounter, the ambulatory care-sensitive designation overestimates the number of ED visits that are truly preventable.<sup>24</sup>

In our study, most patients (72%) who presented to the ED for management of an ACSC were self-referred and did not contact their medical home prior to ED presentation. Physicians identified nearly half (46%) of cases as appropriate for management in the GM clinic; however, the majority (86%) of these patients were self-referred to the ED. Physicians identified the ED as the most appropriate care

location for more than half (53%) of the reviewed cases and cited the acuity of the condition as the main reason why management in the GM outpatient setting would have not been appropriate. In such circumstances, the ED may serve as an extension of the medical home—“a safety net for providers”<sup>25</sup>—and is the most appropriate care location,<sup>3</sup> not a primary care failure.

This study is, to our knowledge, the first descriptive evaluation of ambulatory care–sensitive ED encounters among patients with established access to a medical home. Although the PCMH model emphasizes after-hours care as a means to reduce preventable ED visits, we found that over half (52%) of the reviewed encounters occurred during daytime hours (8 AM to 3:59 PM) and fewer encounters took place on either weekend day compared with all other days of the week. This may indicate patient preference for the ED due to factors such as convenience, personal preference, and perception of need.<sup>18,26–28</sup> Consistent with the findings of prior studies,<sup>4,18,25,27</sup> we found that ED encounters for ACSCs may not be an accurate reflection of primary care accessibility, as patients often present to the ED without first seeking primary care.<sup>18,29,30</sup> Afilalo et al<sup>18</sup> demonstrated that only 22% of patients sought care from their primary care provider before presenting to the ED, and only a minority of these individuals cited lack of primary care availability as the reason for the ED visit. Another study found that Medicaid patients used the ED as their usual source of care despite an adequate number of physicians within the study area and auto-assignment of a primary care physician to all Medicaid beneficiaries.<sup>29</sup>

## Limitations

This retrospective study had some important limitations. First, we conducted our study in a single academic center and our findings may not generalize to all clinical environments. Second, GM physicians may have reviewed medical records of patients from their own practice or clinic site, which may have biased their assessment of the appropriateness of the care location. However, given the large number of ambulatory care–sensitive ED visits, the random nature of the chart selection process, and the low rate of GM referral to the ED, it is highly unlikely that a physician would have reviewed the chart of a known patient. Further, some physicians assessed the ED to be an inappropriate care location despite GM referral, suggesting that reviewers aimed to remain objective in their assessments. A final limitation of this study is that we did not have access to patient insurance information and therefore cannot assess known barriers or facilitators to care, such as co-pays or transportation.<sup>31</sup>

## CONCLUSIONS

Despite these limitations, this study provides new descriptive insight into the usage of ED services for ACSCs among established PCMH patients within a large academic medical center. Our findings suggest that increasing primary care accessibility may be insufficient

to reduce ED visits for ACSCs, as most patients do not contact their medical home prior to ED presentation. Future work should explore the reasons PCMH patients seek care in the ED for conditions that may be appropriate for management in the primary care setting. Additionally, many cases deemed “ambulatory care–sensitive” do, in fact, require immediate care, and the ED is often the most appropriate care location. If policy makers and insurers wish to use ACSCs as a means to identify preventable ED visits, consideration must be given to the patient’s initial condition as well as the diagnostic evaluation process, not simply the discharge diagnosis. ■

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