Relationship Between Continuity of Ambulatory Care and Risk of Emergency Department Episodes Among Older Adults

David J. Nyweide, PhD*; Julie P. W. Bynum, MD, MPH

*Corresponding Author. E-mail: david.nyweide@cms.hhs.gov.

Study objective: We determine whether visit patterns indicative of higher continuity are related to a lower risk of presenting at the emergency department (ED) among older adults.

Methods: This study was a survival analysis between 2011 and 2013 of a 20% random sample of fee-for-service Medicare beneficiaries aged 66 years or older. Ambulatory visit patterns were measured starting in 2011 for up to 24 months using 2 continuity metrics measured on a 0 to 1 scale—Continuity of Care (COC) score and the Usual Provider Continuity (UPC) score. The composite outcome of an ED episode was defined as occurrence of an ED visit with discharge home, an observation stay, or hospital admission. Time-dependent Cox proportional hazards regression models controlled for patient demographic characteristics, comorbidities, previous use, and regional factors, with censoring for death or occurrence of the composite outcome. In a secondary analysis, continuity was measured in the 12 months preceding an ED episode to test whether it was associated with type of ED episode.

Results: The relative rate of ED episodes decreased approximately 1% for every 0.1-point increase in the COC score (adjusted hazard ratio 0.99; 95% confidence interval 0.99 to 0.99; $P<.001$) and 2% for every 0.1-point increase in the UPC score (adjusted hazard ratio 0.98; 95% CI 0.98 to 0.99; $P<.001$), or up to a 10% lower rate between the lowest and highest COC score and a 20% lower rate for the UPC score. Among beneficiaries with an ED episode, higher continuity was associated with a 1% lower risk of observation stay but a 3% to 4% higher risk of hospital admission relative to an ED visit with discharge home.

Conclusion: Ambulatory visit patterns exhibiting more continuity were associated with a lower rate of ED utilization for older adults with fee-for-service Medicare coverage. The association of higher continuity with lower risk of ED use but differences in outcome when an ED visit does occur may reflect more appropriate referral to the ED when outpatient management is no longer adequate. [Ann Emerg Med. 2017;69:407-15.]

Please see page 408 for the Editor's Capsule Summary of this article.

A **feedback** survey is available with each research article published on the Web at www.annemergmed.com.
A **podcast** for this article is available at www.annemergmed.com.

0196-0644/$-see front matter

http://dx.doi.org/10.1016/j.annemergmed.2016.06.027

INTRODUCTION

Background

Fifteen percent of all emergency department (ED) visits and 40% of hospital admissions through the ED in the United States are for patients aged 65 years or older.[1] Reasons that older adults visit the ED vary from experiencing a health problem that demands immediate attention to having difficulty accessing ambulatory care.[2,3] Although addressing a health need is the most common and pressing reason older adults visit the ED, factors related to access to or their experience of care may also be related to their use of the ED. For example, the presence of a usual care physician has been shown to decrease an older adult's risk of visiting the ED.[4]

Three main treatment patterns are possible when older adults present at an ED—they can be released, kept for an observation stay of shorter than 48 hours, or admitted to the hospital for further treatment. Decisions around these treatment patterns have been studied in acute cardiac disease but less so in other conditions.[5,6] Severity of the presenting condition certainly contributes to which of these treatment patterns a patient experiences, but other factors may also be important. If a patient is being closely managed by an ambulatory care physician, he or she may present at the ED only for a serious issue necessitating hospitalization. Likewise, an observation stay or admission may not be necessary if a patient can clearly identify a physician who

Editor's Capsule Summary

What is already known on this topic

A high level of continuity of care is related to less emergency department (ED) utilization among Canadian older adults and commercially insured children and Medicaid patients in the United States.

What question this study addressed

This analysis used a large, national sample of fee-for-service Medicare beneficiaries to study the relationship between continuity of visits for older adults with the occurrence of an ED visit, and disposition after ED visit (ie, discharge, observation stay, or hospital admission).

What this study adds to our knowledge

Higher continuity of care among Medicare patients was associated with less utilization of the ED but increased likelihood of hospitalization as a result of ED visit.

How this is relevant to clinical practice

Efforts to provide continuity of care to Medicare patients may decrease ED utilization.

manages his or her care in the ambulatory setting. As a result, continuity of ambulatory care may influence whether a patient presents at the ED and the ensuing treatment pattern of the ED episode.

Importance

The fee-for-service Medicare program provides health care coverage for most older adults in the United States. Fee-for-service Medicare patients can visit any physician willing to treat them, and physicians can refer patients without network restrictions, with the typical Medicare patient experiencing 8 visits with 4 physicians annually.[7] The pattern of visits provides insight into a patient's care,[8] with a visit pattern concentrated around a physician or small number of physicians suggesting more continuity in contrast to a pattern diffused across several physicians, which suggests greater fragmentation. Evidence from the visit patterns of older adults in Canada, as well as commercially insured children and Medicaid patients in the United States, suggests that a high level of continuity is related to less ED utilization, but older adults in fee-for-service Medicare have not been studied.[9-11]

Goals of This Investigation

We expected that older adults with higher continuity of ambulatory visits would have a lower rate of ED utilization. We analyzed claims data from a large, national sample of fee-for-service Medicare beneficiaries to study whether the continuity of visits for older adults, using 2 different metrics of continuity, had any relationship with the occurrence of an ED episode. We then examined whether continuity was related to whether a patient has an observation stay or hospital admission compared with being discharged home from the ED.

MATERIALS AND METHODS

Study Design

This study used a survival analysis of Medicare patients' ambulatory visit patterns, starting in 2011 for up to 24 months. Patients were followed for 24 months or until death or occurrence of the composite endpoint of an ED episode; that is, an ED visit followed by discharge, an observation stay, or a hospital admission through the ED. Because secondary, deidentified data were used, this study was exempt from institutional review board approval in accordance with Federal common rule (section 45 CFR 46.101[b][5]).

Selection of Participants

Continuously enrolled fee-for-service Medicare beneficiaries aged 66 years or older by the end of 2011 from a 20% random sample were identified in the Master Beneficiary Summary File in the Chronic Conditions Data Warehouse.[12] Medicare Advantage beneficiaries were excluded because their claims data are not available to researchers. Beneficiaries with fewer than 4 ambulatory evaluation and management visits in 2011 were also excluded because continuity metrics can too easily reach their minimum or maximum values of 0 or 1 with few visits, which would create bias in the results.[13] Approximately 30% of the otherwise eligible population were excluded on this basis (characteristics shown in Table E1, available online at http://www.annemergmed.com).

Methods of Measurement

Ambulatory visits in Medicare are billed in the Carrier file or, for some providers who work at Federally Qualified Health Centers or Rural Health Clinics, in the hospital outpatient file. In the Carrier file, ambulatory evaluation and management codes billed by primary care and specialist physicians, as identified by the specialty code on the claim, were included in the measurement of continuity (evaluation and management codes in Appendix E1, available online at http://www.annemergmed.com). In the hospital outpatient file, visits at Federally Qualified Health Centers or Rural