

BMJ Open Quality Primary care gap: factors associated with persistent lack of primary care after hospitalisation

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ABSTRACT

Introduction Access to primary care in the USA is associated with decreased acute care utilisation and better health outcomes, yet millions of Americans lack a primary care provider (PCP). In our study, we report the risk factors for having no assigned PCP for hospitalised patients both at the time of discharge and over the course of the following year.

Methods We conducted a retrospective cohort study of 12 663 adult patients discharged from the medicine service at our academic inpatient hospital from 2017 to 2018. We compared the characteristics of patients with and without a PCP listed in the electronic health record at time of discharge. In a second analysis, for those patients without a PCP, we used subsequent encounters with our health system to compare characteristics of those who had a PCP assigned within 1 year after discharge with those who did not.

Results At time of discharge, patients without a PCP were more likely to be younger, male, non-Asian and non-Black, to have Medicaid insurance or to be self-pay, to be experiencing homelessness and to have a substance use disorder diagnosis. During the year after discharge, the most significant risk factors for persistently lacking a PCP were non-private insurance status (Medicaid, Medicare, self-pay), experiencing homelessness and having a substance use disorder diagnosis.

Discussion Our study demonstrates important risk factors for persistently lacking an assigned PCP in our urban patient population, including health insurance status, homelessness and substance use disorders. Targeted interventions are indicated to connect these high-risk individuals to primary care.

INTRODUCTION

In the USA, use of primary care has been associated with enhanced access to health-care services, better health outcomes and a decrease in hospitalisation and use of emergency department (ED) visits.¹ A cross-sectional analysis of US metropolitan areas throughout the 1990s found that increased proportions of primary care providers (PCPs), rather than specialists, were associated with significant decreases in measures of health-care utilisation and better health outcomes.^{2,3} Conversely, healthcare utilisation seems to be higher among those who don't access primary care. Lack of access to primary care has

Key messages

What is already known on this topic?

- Access to primary care is associated with lower healthcare costs and better outcomes, but risk factors for not having access to a primary care provider are not well studied.

What this study adds?

- This retrospective cohort study of primary care provider access at time of discharge from hospital admission delineates risk factors for persistently lacking a primary care provider, including non-private health insurance, homelessness and substance use disorders.

How this study might affect research, practice or policy?

- This study can help inform targeted interventions to connect high-risk individuals to primary care.

been shown to be a risk factor for recurrent hospital admissions. Dupre *et al* showed that cardiovascular patients admitted to a large medical centre who reported difficulties accessing primary care had significantly higher 30-day readmission rates than patients who did not report difficulty accessing care.⁴ For over 350 000 Medicare beneficiaries from 2008 to 2017 whose primary care physicians transitioned out of Medicare, the loss of a primary care physician was associated with decreased use of primary care and increased use of specialty, urgent and ED care, as well as an increase in spending.⁵

Despite these benefits, over 40 million Americans do not have a specific source of ongoing care.⁶ In 2008, one in five US adults reported not having a source of primary care, and 28% of Medicare beneficiaries reported difficulty finding a PCP (compared with only 11% reporting difficulty finding a specialist).⁷ Factors that have been associated with decreased access to primary care include race/ethnicity, gender, income, employment status, insurance status and medical/psychiatric comorbidities. Compared with white Americans, both African Americans and



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Latinos are less likely to have a specific source of ongoing care and less likely to have a usual PCP.⁶ Low-income individuals are also less likely to have a consistent source of care, associated with being uninsured or underinsured.⁸ Prior to the Affordable Care Act, a study based on the 1996 Medical Expenditure Panel Survey found that the experience of primary care varied according to insurance status. Insured individuals were able to obtain better primary care than the uninsured, privately insured people were able to obtain better primary care than publicly insured, and those with fee-for-service coverage experienced better longitudinal care and fewer barriers to access than those insured through HMOs.⁹ A study since the health-care law was passed has found that 'despite Affordable Care Act-related gains in insurance coverage, those with on-exchange and off-exchange individual private insurance plans and Medicaid encounter more barriers to care than those with employer-based insurance.'¹⁰

A hospitalisation often represents a change in a patient's health status such as worsening of a chronic illness or a new serious diagnosis, and may present a key opportunity to engage a patient in primary care. A better understanding of the sociodemographic characteristics associated with not having a PCP could promote targeted hospital-based interventions to connect individuals at risk to primary care, reducing health disparities and improving healthcare utilisation and outcomes. In our study, we report the risk factors for having no assigned PCP for hospitalised Internal Medicine patients both at the time of discharge and a year of follow-up at our large urban academic medical centre.

METHODS

Setting and study population

We conducted a retrospective cohort study of patients discharged from the Hospital Medicine service at a single, urban 600-bed academic hospital. The Hospital Medicine service is comprised of eight teaching and seven direct-care teams with an average daily census of approximately 140 acute care and critical care patients and approximately 7000 annual discharges. The Medicine service cares for a breadth of internal medicine patients, including solid oncology and geriatric patients and excluding general cardiology, neurology, bone marrow transplant and solid-organ transplant services. All adult (age 18 or older) patients admitted to the Hospital Medicine service are cared for by faculty physicians; no patients are cared for by private physicians. Our institution utilises an Epic based electronic health record (EHR) platform (Epic 2017, Epic Systems, Verona, Wisconsin, USA), and data elements were pulled from the relational database that stores Epic's inpatient data, Clarity. The study population included all patients over age 18 discharged alive from the medicine service from 1 January 2017 to 31 December 2018, a total of 12 663 patients in the total sample. Patients admitted under observation were excluded.

PCP identification and assignment

In our health system, all patients admitted to the hospital or seen in ambulatory clinics are asked about their PCP during the registration process, and PCP information is entered into the EHR. Rather than using manual entry, our institution employs a searchable statewide practitioner registry to populate the PCP field. Hospital medicine teams are asked to review PCP information at admission and validate its accuracy with their patients. Patients with a relevant specialist acting as their primary source of care (eg, oncologist, nephrologist) will have that provider listed in the PCP field. Primary teams and discharge coordinators are also responsible for contacting the PCP during the first 24 hours of admission and scheduling a follow-up appointment within 14 days of discharge. Patients without a PCP can be accepted by internal medicine residents into their resident panels, referred to our institution's primary care clinics and provided information about drop-in urgent care clinics where they can obtain primary care services. Given the California's adoption of Medicare expansion, the rate of uninsured patients is <0.5%, and our institution accepts greater than 99% of local plans, other than out-of-county Medicaid plans.

Covariates

We a priori selected variables to examine based on associations with primary care access described in previous literature.^{4 8 11–15} We defined homelessness as having either a zipcode labelled as 99999, address PO BOX 0208, had discharge homeless form completed, or had other indicators in address history. Patients who had a value of 'unknown', 'declined' or 'missing' in ethnicity were recoded as 'Not Hispanic/Latino'. Substance use and Psychiatric comorbidities were identified using relevant ICD-10 codes (WHO International Classification of Diseases, 10th edition - see online supplemental appendix for codes used). The Agency for Healthcare Research and Quality Elixhauser Comorbidity Index was used as a single numeric score that summarises disease burden and mortality during hospitalisation.¹⁶

Data analysis

We analysed demographic data, including PCP status, for 12 675 alive unique-patient discharges from the Hospital Medicine service in calendar year 2017 and 2018. Patients were designated as having a PCP, or no assigned PCP, based on having a valid provider name within the PCP field at the time of discharge (figure 1). We compared the characteristics of patients with and without a PCP using Wilcoxon rank sum tests for non-normally distributed data and χ^2 tests for categorical data. For patients with multiple encounters, only the first encounter was included.

For those patients without a PCP, we extracted all encounters with our institution in the subsequent year following discharge to determine those patients who had a PCP assigned in the EHR within 1 year. We chose a year follow-up to allow for sufficient time for follow-up

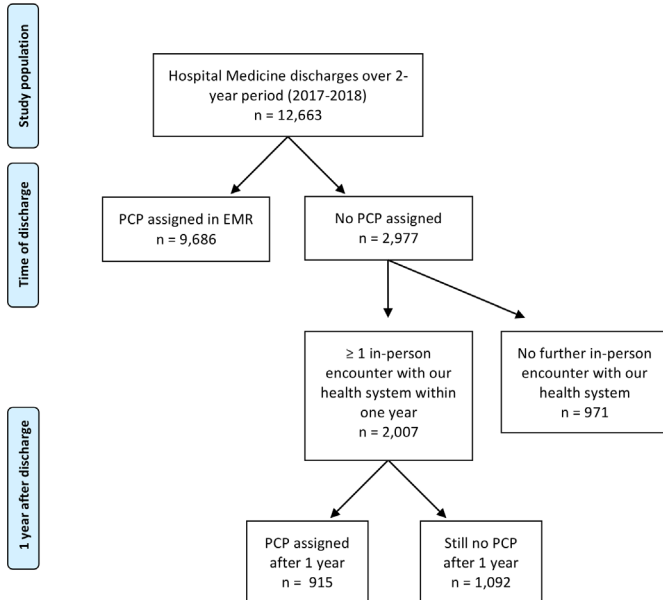


Figure 1 Study population and comparison groups. EMR, electronic health record; PCP, primary care provider.

encounters that would reasonably identify a PCP if obtained. Eligible follow-up encounters included procedural, ambulatory, observation, and inpatient encounters. We examined patient demographics associated with subsequently being assigned a PCP, as well as time from discharge to assignment of a PCP. The encounter associated with obtaining a PCP and the location of the PCP practice as within or outside of our health system were recorded. We also calculated the 30-day readmission rate for those with and without a PCP. We used multivariate logistic regression to assess the relationship between patient demographics and risk of not having a PCP at discharge. We also conducted the same multivariate logistic regression to assess the risk factors for not having a PCP within 1 year of follow-up among patients who had a subsequent encounter with our health system. In this regression model, a range of a priori patient and clinical covariates were included.

Patient and public involvement statement

The research question for this study was determined based on front-line faculty and resident provider experiences of caring for internal medicine patients from the same community in both the inpatient and outpatient settings. Patients were not directly asked about the research question or study design. We plan to disseminate study results to the wider patient community via forthcoming quality improvement work involving targeted outreach to patient populations that are less likely to have access to primary care.

RESULTS

The Hospital Medicine service had 12663 unique alive discharges from January 2017 to December 2018, of which most 9685 (76.5%) had a PCP at the time of discharge

(figure 1). The demographics of those with and without a PCP are shown in table 1. After multivariate logistic regression, 12660 patients were included in the model. Patients discharged without a PCP were more likely to be younger, male, white or Caucasian, and to have Medicaid insurance or to be self-pay (table 2). They were more likely to have Chinese as their primary language. They were also more likely to have diagnoses associated with substance use disorder and homelessness. Psychiatric disorder diagnoses and Russian primary language were associated with an increased likelihood of having a PCP at discharge. There was not a significant difference in risk of not having a PCP based on ethnicity (Hispanic vs non-Hispanic), nor did patient comorbidities or geographic location play a role.

Of the 2975 (23.5%) patients discharged without a PCP, 2006 (67.4%) patients had at least one subsequent encounter with our healthcare system within the next year. Out of those with at least one subsequent encounter in 1 year, 915 (45.5%) were assigned a PCP in the EHR, 310 (35%) of those with a PCP affiliated with our institution. The average number of days to PCP assignment was 97 (median 63, IQR 18–150). Patients assigned a PCP within our health system had a shorter mean time to assignment (92 days vs 99 days). Of those who were subsequently assigned a PCP, 197 (21.53%) were assigned within 2 weeks. Patients without a PCP at discharge had a 30-day readmission rate of 20.15% (600 of 2977) compared with 17.2% (2180/12,663) in the general population ($p=0.004$).

After multivariate logistic regression, among patients who had a subsequent encounter with the health system within the year following admission, the factors associated with persistent lack of a PCP (table 3) were self-insured status (OR 5.2), Medicare (OR 1.5), Medicaid (OR 1.4) and homelessness (OR 2.7). We examined both changes in insurance and housing at initial discharge and on follow-up encounters for those who obtained a PCP. In the time period from discharge to the time they obtained a PCP, only 91 (10%) patients had a change in insurance status and 217 (30%) patients had a change in address, neither of which was independently associated with obtaining a PCP.

DISCUSSION

In this retrospective cohort study of patients discharged from the Hospital Medicine service at a large urban academic health system, we identified the main risk factors for not having a PCP at time of hospital discharge as self-pay status or Medicaid coverage, male gender, substance use disorder diagnosis, homelessness and younger age. Patients with a PCP were more likely to be white or Caucasian, and there was no demonstrated difference in rates of having a PCP based on Hispanic ethnicity or based on comorbidities. Patients with psychiatric disorder diagnoses and Russian as their primary language were more likely to have a PCP at discharge. Risk factors

Table 1 Comparisons of patient characteristics with and without PCPs at discharge

	PCP assigned N=9685 (76.48%)	No PCP N=2978 (23.52%)	
Age years median, (IQR)	63 (49–76)	53 (37–67)	<0.001
Gender			
Male	4700 (48.53)	1737 (58.37)	<0.001
Race			<0.0001
Asian	2094 (21.62)	412 (13.83)	
Black	1465 (15.12)	519 (17.43)	
White	4619 (47.69)	1483 (49.80)	
Other	15087 (15.56)	564 (18.94)	
Ethnicity			<0.0001
Hispanic	1047 (10.81)	434 (14.57)	
Not Hispanic or Latino	8638 (89.19)	2544 (85.43)	
Marital status			<0.0001
Married or partnered	3932 (41.12)	869 (30.17)	
Divorced or separated	940 (9.83)	274 (9.45)	
Single	3518 (36.79)	1525 (52.95)	
Widowed	1173 (12.27)	212 (7.36)	
Language			<0.0001
English	7890 (81.47)	2558 (85.90)	
Spanish	331 (3.42)	134 (4.50)	
Chinese	902 (9.31)	164 (5.51)	
Russian	230 (2.37)	23 (0.77)	
Other	332 (3.43)	99 (3.32)	
Insurance			<0.0001
Medicare	5303 (54.75)	981 (32.94)	
Medicaid	2237 (23.10)	1320 (44.33)	
Private	2064 (21.31)	563 (18.91)	
Self-pay	28 (0.29)	80 (2.69)	
Other state/federal	53 (0.55)	34 (1.14)	
Substance use	1036 (10.70)	703 (23.61)	<0.0001
Homelessness	861 (8.89)	816 (27.40)	<0.0001
Psychiatric comorbidity	2833 (29.25)	939 (31.54)	0.0174
Residence in San Francisco County	5896 (60.88)	1793 (60.21)	0.5130
Elixhauser Comorbidity Index	9 (1,17)	8 (0,15)	<0.0001

PCP, primary care provider.

for still not having a PCP 1 year after discharge included a subset of the initial risk factors: self-pay status, Medicaid coverage and homelessness. Among those without a PCP, Medicare coverage was also a risk factor for not having a PCP at 1 year. Age, race, gender, substance use and comorbidities were not significant risk factors for not having a PCP assigned within 1 year of hospitalisation.

Our findings that publicly insured and self-pay individuals are less likely to have a PCP is consistent with previous studies, in which these individuals self-reported poorer access to quality care than the privately insured.^{9 10} The finding that males were less likely to have a PCP is

also consistent with previous work showing that women are more likely to use primary care services, while men are more likely to use emergency and hospital services.¹⁷ Substance use disorder as a risk factor for not having a PCP confirms known evidence that people with substance use disorders are less likely to access primary care and also have high Emergency Department and hospital utilisation.¹³ Likewise, people experiencing homelessness have been shown to report lower access to primary care in the setting of significant barriers, including stigma, financial concerns, transportation issues and competing demands on time and energy, as well as high rates of

Table 2 Summary of multivariate model of significant predictors of not having a PCP after the initial encounter

		OR	
Model	n		
Entire sample	12 660	OR	95% CI
Age		0.99	0.98 to 0.99
Gender (male)	6437	1.28	1.17 to 1.40
Race*			
Asian	2505	0.79	0.67 to 0.93
Black	1984	0.87	0.77 to 0.99
Other	2070	0.99	0.85 to 1.15
Insurance*			
Medicare	6284	0.93	0.81 to 1.07
Medicaid	3556	1.56	1.38 to 1.78
Self	106	8.61	5.46 to 13.56
Other	87	1.58	1.00 to 2.50
Language*			
Chinese	1066	1.29	1.03 to 1.62
Spanish	465	1.28	1.00 to 1.65
Russian	253	0.61	0.39 to 0.95
Other	430	1.33	1.03 to 1.72
Substance use disorder	1739	1.23	1.08 to 1.40
Homelessness	1675	2.67	2.34 to 3.04
Psychiatric ICD-10	3771	0.85	0.77 to 0.94

Bolded odds ratios and confidence intervals are statistically significant

*Reference for race was white or Caucasian, reference for insurance was commercial/private, and reference for language was English.

comorbid substance use and psychiatric concerns.¹⁸ In our patient population, the previously shown lack of access to primary care among Black and Latino individuals was not demonstrated.⁶ It is unclear why patients with psychiatric diagnoses were more likely to have PCP's in

Table 3 Summary of multivariate model of significant predictors of not having a PCP after 1 year in those discharged without a PCP and with a subsequent encounter

		OR	
Model	n		
Entire sample	2007	OR	95% CI
Insurance			
Medicare	640	1.50	1.10 to 2.04
Medicaid	931	1.42	1.09 to 1.85
Self	17	5.21	1.46 to 18.63
Other	19	1.43	0.53 to 3.85
Homelessness	529	2.53	1.90 to 3.36

Bolded odds ratios and confidence intervals are statistically significant

PCP, primary care provider.

our study, but this likely relates to the heterogeneity of psychiatric disorders, that is, patients with mild anxiety and depression could have different primary care access from patients with psychotic disorders or other severe mental illness. There is also possibly a difference in rates of diagnosis, where patients with PCP's are more likely to be diagnosed with psychiatric disorders that are coded under ICD-10 codes.

Despite systems-based solutions at our institution to connect patients with PCPs and expectations around PCP follow-up, the majority of patients without a PCP at discharge, who had at least one subsequent encounter in our institution, did not have an assigned PCP within 1 year. While our study could not evaluate why, and factors such failure to record a PCP when one exists is a possible explanation, more concerning is that our healthcare system perpetuates barriers for vulnerable populations in accessing primary care. While insurance considerations are well documented, challenges for marginally housed patients or those struggling with substance use disorder are poorly studied. As a healthcare system, if we are to reduce costs of care, access to primary care should be a priority. A policy paper examining how to improve primary care access for homeless persons recommended increased access by putting clinics in close proximity to shelters and using flexible hours, housing clinics in non-traditional sites frequented by homeless persons, and providing mobile outreach models to access care.¹⁹ Providing housing has also been shown to be an effective strategy in increasing primary care access. An Oregon study demonstrated that supportive housing with health-related services increased primary care visits by 20% and decreased Emergency Department visits by 18% across 145 affordable housing properties.²⁰ Similarly, advocates for improved substance use treatment advocate for ending the traditional separation of substance use treatment from primary care and mental health services, citing the evidence that closer integration can improve the quality of care and improve resource use.²¹ When examining the factors that may have perpetuated the lack of primary care in those experiencing homelessness and with substance use disorders, we must also consider that provider bias may have exacerbated disparities of PCP access, with providers potentially less likely to refer a patient to a PCP who they believe will not follow-up, or less likely to adopt a patient with substance use or homelessness into their panel.

Our study demonstrates known disparities in primary care access by using actual PCP assignment in the EHR. This builds on previous evidence, which has primarily relied on patient self-reports or large administrative datasets about primary care access. We found significant disparities in primary care access specifically among populations known to be high risk which may be affecting patient outcomes, as evidenced by the higher readmission rates in our patients without a PCP at discharge.

This study has certain important limitations. First, this is a single-centre study of an academic tertiary care hospital



in an urban setting known to have limited primary care access, thus limiting its external validity. Second, the study relies on the PCP field in the EHR being accurately updated. Some patients who actually have a PCP may not have one listed in the EHR, and some patients without a PCP may inaccurately have one listed. We made the assumption that this occurred equally in both directions. As a third limitation, the demographic characteristics, other than insurance status and address, were used only from the time of hospital discharge. So for patients without a PCP at time of discharge who obtained a PCP within 1 year, we do not know whether their risk factors might have changed (eg, entering substance use disorder treatment) and affected their chance of obtaining a PCP. Finally, it is important to acknowledge that having a listed PCP is not synonymous with being able to access primary care, since many patients report difficulties getting primary care appointments and developing an effective longitudinal relationship with a PCP.

Overall, our study demonstrates important risk factors for not having an assigned PCP in our urban patient population, including health insurance status, homelessness and substance use disorder diagnosis. Targeted interventions are required to connect these high-risk individuals to primary care, with the ultimate goal of reducing health disparities and improving healthcare utilisation and outcomes.

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Contributors EC conducted initial literature review, with assistance from MM. EC and MM facilitated the pulling of relevant data and conducted preliminary data analysis. SM then performed most of the data analysis and composed the Methods section. EC wrote the Abstract, Introduction, Results, Discussion and Conclusions sections of the manuscript. MM supervised the project as the Principal Investigator and assisted with writing and editing all sections of the manuscript. MM is the guarantor of this work.

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