Reasons for Choice of Referral Physician Among Primary Care and Specialist Physicians

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BACKGROUND: Specialty referral patterns can affect health care costs as well as clinical outcomes. For a given clinical problem, referring physicians usually have a choice of several physicians to whom they can refer. Once the decision to refer is made, the choice of individual physician may have important downstream effects.

OBJECTIVE: To examine the reasons why primary care and specialist physicians choose certain specific colleagues to refer to and how those reasons differ by specialty.

DESIGN: Cross-sectional Web-based survey supplemented with analysis of administrative claims data.

PARTICIPANTS: A total of 616 physicians in office-based patient care specialties who were members of an academic physicians' organization and treated Medicare patients in 2006.

MAIN MEASURES: A total of 386 respondents (63% response rate) were presented with a "roster" of other physicians' names with whom we predicted they had a relationship based on sharing Medicare patients. Among physicians in their "professional network" (consisting of any listed physician with whom respondents acknowledged a professional relationship), respondents reported if they referred to those physicians, and if so, provided up to two reasons why they referred to that particular colleague. Using logistic regression, we examined the likelihood that different specialists would endorse specific reasons for referring to chosen colleagues.

KEY RESULTS: Primary care physicians (PCPs) initiated referrals to 66% of their "professional network" colleagues, while medical and surgical specialists initiated referrals to 49% and 52%, respectively ($p<0.001$ for both versus PCPs). After adjustment, medical specialists were less likely than PCPs to cite ease of communication with colleagues (RR=0.69, 95% CI=0.49–0.91), and medical and surgical specialists were less likely than PCPs to cite "shares my medical record system" as a reason to refer (medical specialist RR=0.13, 95% CI 0.03–0.40, surgical specialist RR=0.26, 95% CI=0.05–0.78).

CONCLUSIONS: Specialists frequently initiate referrals, bypassing PCPs. In choosing specific physicians to refer to, PCPs are more often concerned with between-physician communication and patient access. Modifying referral practices among doctors may need to account for such patterns of behavior.

KEY WORDS: health services research; physician referral; reasons for referral; primary care.

J Gen Intern Med
DOI: 10.1007/s11606-011-1861-z

Received March 7, 2011
Revised July 25, 2011
Accepted August 16, 2011

Published online: 16 September 2011

INTRODUCTION

Physician referral decisions influence many aspects of patient care, including subsequent costs and quality.[1,2] Marked variations in referral rates among individual physicians independent of patient case mix have been noted in a variety of settings, implying that there is substantial heterogeneity in the threshold for referral among physicians.[3] Besides deciding whether or not to refer in the first place, physicians also influence which other specialists patients see.[4,5] The specific specialist to whom a patient is referred can profoundly impact the clinical care trajectory for that patient because individual physicians differ in their approaches to care, including the use of high-cost services and quality of care.[5–9] In addition, future policy interventions to control cost growth will likely attempt to modify referral practices by either trying to prevent inappropriate referrals or steering providers to refer to colleagues who utilize fewer services.[10] In this context, understanding which factors motivate physicians to refer to particular colleagues could be crucial to the success of such interventions.

Few studies have explored how physicians choose colleagues to whom they refer,[4,11,12] and this research has focused solely on primary care physicians.[4,12–14] Many referrals, however, originate from specialist physicians, who often make referrals within their clinical area.[15] Thus, to understand how referral choices are made in the US health care system, it is valuable to understand how both PCPs and specialists choose doctors for referrals.[16] To address this question, we surveyed physicians in different specialties about the reasons they choose specific colleagues for referrals.

METHODS

Survey Participants

We surveyed physicians who were members of a physicians' organization associated with an academic medical center and several outlying community hospitals in the greater Boston area, who cared for Medicare patients in 2006, and who had been affiliated with the physician organization since then. The payer mix of the physicians' organization includes a mix of commercial health insurance, Medicare, and Medicaid. At the time of the survey, the organization was not participating in any full risk contracts. In addition, there were no explicit limitations for referrals to other physicians for Medicare patients in this physicians' organization. We limited eligible respondents to those in traditionally office-based patient care specialties or hospitalists (excluding anesthesiologists, emergency medicine, radiologists, and pathologists). We identified 616 physicians (of whom 1.8% were hospitalists). Full details on the cohort of physicians surveyed and survey design are discussed elsewhere.[17]

Survey Administration

The survey was administered using a Web-based survey application, KeySurvey (http://www.keysurvey.com) from February through June 2010.[17] Each physician was invited by mail to participate and provided a personalized password to access a uniquely generated survey for that physician. The mailing included a $5 bill and a privacy statement from the Centers for Medicare and Medicaid Services. Non-responders received e-mail and telephone follow-up and were offered the opportunity to complete the survey over the phone.

Survey Instrument

The survey was designed to elicit information about referral and information-sharing relationships with other physicians of any specialty. We assessed the nature of respondents' relationships with other physicians through the use of an individualized roster of 20 physicians, 16 of whom shared Medicare patients with the respondent in 2006. To identify other physicians with whom the physician shared patients, we used 100% of Medicare claims for patients living in the Boston hospital referral region during 2006. We identified a potential referral relationship between two doctors if they each had a significant encounter (defined as a CPT code for a face-to-face office or hospital visit or a meaningful procedure code with an RVU value of at least 2) with one or more common patients. Overall, the 616 physicians treated 46,937 Medicare patients enrolled in Medicare Part A and B during 2006.

To construct each respondent's individual roster of 20 physicians for the survey, we first sampled 16 eligible physicians of any office-based specialty (which could have included hospitalists) who were linked to the respondent through shared Medicare patients, oversampling those with whom that physician shared more patients. We additionally included four physicians from the physicians' organization with whom the respondent did *not* share any Medicare patients in 2006 as a negative control. For the few physicians with 16 or fewer shared patient relationships in our data, we included all linked physicians.

When presented with the roster, respondents were asked to describe their relationship with each of the physicians by indicating all of the following options that applied: (1) "I refer patients to him/her," (2) "I receive referrals from him/her," (3) "We share patients but don't refer to each other," (4) "I seek him/her out for informal clinical advice," (5) "He/she seeks me out for informal clinical advice," (6) "Member of my practice," and (7) "None of the options apply." We defined the "professional network" of each respondent as the physicians for whom respondents selected any option above except for "None of the options apply." This "professional network" represents a sample of the relationships each respondent has within his or her professional community. For each relationship for which respondents indicated that "I refer patients to him/her," we further asked why they chose to refer to that physician. In answering these questions, respondents were asked to consider the last patient they referred and then select from a dropdown menu the "most" and "second most" important reasons, "*besides clinical expertise*, for selecting that physician." We asked respondents to consider reasons other than clinical expertise because in pretesting, physicians uniformly chose clinical expertise as the most important response, as is also suggested from prior literature.[4,11,12] Thus, we excluded clinical expertise as it would potentially obscure other factors physicians use to distinguish among colleagues of comparable skill. The "reasons for referral" (Table 1) were adapted from prior literature and modified after pilot testing the survey instrument with physicians. We reference these reasons for choice of referral physician with the phrase "reasons for referral" in this study.

For analysis, we grouped the ten reasons into three clinically relevant categories: patient experience with physician, patient access, and physician communication (Table 1).[11,12] To control for potential question order effects, respondents were randomly presented one of two differently ordered lists of reasons for referral.

Table 1. Reasons for Choice of Referral Physician Used in the Survey Instrument*

Category: Patient experience with physician
(1) My patients have good experiences with this physician
(2) Physician has good patient rapport
Category: Patient access
(3) Timely availability of appointments
(4) Location convenient for patient
(5) Patient request
(6) Speaks patient's language
Category: Physician communication
(7) Physician refers to me
(8) Quality of communication with me
(9) Shares my medical record system
(10) Works in my hospital or practice
Other

**Categories were not included in the survey instrument*

To minimize survey burden, we asked respondents about their reasons for referring to any of the first ten physicians presented on their roster. Because of this design, not all respondents had the opportunity to provide reasons for referral to other physicians because the physicians to whom they referred did not appear among their first ten names listed. We refer to the group of respondents who gave information on referral relationships as the "study cohort." All respondents were asked to provide basic demographic and medical practice information.

Statistical Analysis

We compared the study cohort with all respondents according to demographic and practice characteristics. We grouped physicians into four categories based on self-reported specialty: primary care physicians (PCPs, including general internal medicine, family medicine, general practice, preventive medicine, geriatrics, or general osteopathy), medical specialists, surgical specialists, or other specialists (e.g., psychiatry). To assess differences, we used χ^2 or t-tests, as appropriate. We assessed differences in proportions of referral relationships within respondents' "professional networks" by using the two-proportion *z*-test with Yates' continuity correction.[18]

In analyzing reasons for referral given by respondents, we examined whether or not respondents chose a specific reason as either the "most" or "second most" important reason for referral. To estimate the adjusted relative risk of choosing a particular reason for referral to a specific colleague for physicians in different specialty groups, we constructed separate logistic regression models for each reason. Models were fit using generalized estimating equations (GEE)[19] where the outcome was the particular reason to refer to a colleague and the primary predictor of interest was the respondent's specialty. For the GEE estimation, an exchangeable working correlation matrix was used to account for clustering of referral relationships within respondents. Separate models were estimated for each of the reasons for referral outcomes (excluding "other") and the three broader reason categorizations ("patient experience with physician," "patient access," and "physician communication"). The other covariates in the model included: race (white, non-white), sex, years since medical school graduation, number of clinical days per week (0–1, 1.5–3.0, ≥3.5), size of practice (1–2, 3–11, 11–50, >50 physicians), and hospital affiliation (academic center, other hospital).

We calculated adjusted relative risks with 95% confidence intervals by taking the difference in the probability of choosing a particular reason for referral for a medical or surgical specialist vs. primary care specialist, assuming mean values for all other variables.[20,21] Of 606 relationships where respondents gave a reason for referral, we excluded 12 relationships where respondent covariates were missing. All tests of statistical significance were two-sided and conducted using R statistical software, version 2.11.1. Logistic models were fitted using GEE, and simulations were performed with the use of the *gee* and *Zelig* packages for R.[19,22,23] This study was approved by the Harvard Medical School Committee on Human Studies.

RESULTS

Of the 616 physicians contacted, 386 responded (response rate, 63%). Compared with the study sample, non-respondents were more often affiliated with one of the community hospitals and were slightly older. Of the 386 respondents, 253 had the opportunity to provide reasons for referral for cited colleagues, and 243 responded to this portion of the survey. These 243 respondents comprise the "study cohort" in this report and represent 63% of respondents. Compared with respondents overall, the study cohort was more often female (p=0.03), specializing in primary care (p<0.001), and working more clinical days per week (p=0.03) (Table 2). The groups were otherwise similar. Comparisons of the study cohort and all respondents to non-respondents are presented in the Appendix Table.

Table 2. Characteristics of Respondents and Non-Respondents

		Study cohort (N=243)	All respondents (N=386)	
		%	%	p-value*
Sex	Male	64	68	0.03
	Female	36	32	
Race†	White	84	84	0.96
	Non-white	16	16	
Hospital	Academic center	88	88	0.86
	Other	12	12	
Specialty	PCP	36	28	<0.001
	Medical	36	41	
	Surgical	25	25	
	Other	3	7	
Practice size†	Solo or 2-physician	14	14	0.57
	3-10 physicians	35	33	
	11-50 physicians	32	34	
	>50 physicians	19	19	
Clinical days per week†	0–1‡	30	27	0.03
	1.5–3	24	34	
	3.5 or more	45	39	
Years since medical school graduation	Mean (SD)	26.5 (10.9)	25.7 (10.8)	0.051
	Median (IQR)	25 (18–34)	24 (16–34)	

*P-values calculated using a two-sample t-test or χ^2 test, as appropriate, and represent comparison of all respondents (see * note below) to study cohort. (IQR=interquartile range, PCP=primary care physician, SD=standard deviation)*

**Respondent characteristics taken from survey responses for respondents and from AMA Masterfile or physicians' organization database for non-respondents*

†*Race was missing for 1 respondent, practice size for 4 respondents and clinical days per week for 4 respondents. Missing data were not included in calculations of percentages for each category*

‡*4 respondents in the study cohort indicated that they work 0 clinical days per week. These clinicians were seeing Medicare patients in 2006; the data set we used to generate our list of relationships, and transitioned into other roles by the time of survey administration in 2010*

"Professional Networks" and Referral Relationships for PCPs and Specialists

When examining the relationships within the "professional networks" of respondents (i.e., physicians listed in the survey with whom respondents acknowledged a professional relationship), PCPs indicated that they initiated referrals with 66% of these colleagues. In contrast, medical and surgical specialists initiated referrals for 49% and 52% of their "professional network" colleagues, respectively ($p<0.001$ for difference of both proportions versus PCPs). A substantial proportion of medical specialists' and surgeons' referrals involved other specialists. Among medical specialist-initiated referral relationships, 10% of referral relationships were with PCPs, while 56% and 32% of their referral relationships were with medical and surgical specialists, respectively. Surgeons showed similar patterns, with 20% of their referral relationships with PCPs, 43% with medical specialists, and 34% with other surgeons.

Reasons for Choice of Referral Physician

Table 3 shows the proportion of respondents, by specialty, who cited each specific reason for referral as either the "most" or "second most" important reason for referring to a colleague. Physicians in the study cohort were most likely to cite that "my patients have good experiences with this physician" or "physician has good patient rapport," with 67.0% of relationships cited by respondents listing one of these reasons (Table 3). The next most cited reason was physician communication, with 55.0% of respondents' citing these reasons, significantly more than the 27.9% of respondents' reasons that fell into the patient access category ($p<0.001$).

There were significant differences between the reasons for referral cited by respondents of different specialties (Table 3). PCP respondents were less likely than specialists to cite reasons related to patient experience with the physician, mostly driven by the much higher rate of specialists citing "physician has good patient rapport" as a reason (32.0% of medical specialists, 33.9% of surgical specialists versus 15.7% of PCPs, $p<0.001$ for both). Conversely, PCPs were more likely to cite reasons relating to patient access or physician communication when compared with medical or surgical specialists. For instance, PCPs cited "timely availability of appointments" as a reason for 15.7% of their referral relationships, compared with 11.2% and 6.5% for medical ($p=0.20$) and surgical specialists ($p=0.02$), respectively. PCPs were also more likely than specialists to cite as a reason that the physician "shares my medical record system" (17.9% for PCPs versus 11.2% of medical and 2.4% of surgical specialists; $p=0.06$ and $p<0.001$, respectively). Surgeons were the most likely specialists to give the reason "physician refers to me," which was cited by surgeons for 8.9% of their referral relationships, versus 0.4% of PCP and 1.5% of medical specialist relationships ($p<0.001$, $p=0.004$, respectively).

In multivariable logistic regression models, both medical and surgical specialists were significantly more likely than PCPs to cite "physician has good patient rapport" as a reason for referral (medical specialist RR=1.97, 95% CI=1.21–2.94, surgical spe-

Table 3. Proportion of Relationships Cited by Respondents with Specific Reasons for Referral, by Specialty (606 relationships cited by 243 respondents)

Reasons for referral‡	Referral relationships cited, by specialty of respondent					
	All relationships (N=606)	PCP* (N=274)	Medical specialists* (N=197)		Surgical specialists* (N=124)	
	%	%	%	p-value†	%	p-value†
Patient experience with physician§	67.0	60.2	72.6	0.01	71.8	0.03
My patients have good experiences with this physician	53.1	51.5	54.3	0.60	54.0	0.71
Physician has good patient rapport	25.1	15.7	32.0	<0.001	33.9	<0.001
Physician communication‖	55.0	62.0	46.7	<0.001	52.4	0.09
Works in my hospital or practice	30.5	32.8	23.4	0.03	36.3	0.58
Quality of communication with me	19.5	23.7	17.8	0.15	13.7	0.03
Shares my medical record system	12.5	17.9	11.2	0.06	2.4	<0.001
Physician refers to me	2.5	0.4	1.5	0.00	8.9	<0.001
Patient access	27.9	32.5	25.4	0.12	21.8	0.04
Location convenient for patient	13.0	12.8	13.2	1.00	13.7	0.92
Timely availability of appointments	12.2	15.7	11.2	0.20	6.5	0.02
Patient request	3.5	5.5	2.0	0.10	0.8	0.05
Speaks patient's language	0.5	0.7	0.0	0.63	0.8	1.00
Other	11.4	8.8	17.8	0.01	8.1	0.97

Sample sizes in these columns indicate the number of relationships cited by respondents in each category, not the number of respondents. Respondents could cite more than one relationship and provide differing reasons for those referral relationships

†*p-values reported are for comparisons with proportions in the PCP column. These were calculated using the z-test for proportions with Yates' continuity correction. Bold values indicated p-value <0.05*

‡*Proportions in this table are for respondents selecting the reasons below in either the "Most" or "2nd Most" important reason for any given referral relationship. Because two reasons are selected per relationship, the proportions in each column exceed 100%. Furthermore, the selected reasons may be in "Patient experiences with physician," "Physician communication," and "Patient access," and so the within-category sums generally exceed the category proportion*

§*"Patient experience with MD" is the sum of the "My patients have good experiences with this physician" and "Physician has good patient rapport"*

‖*"Patient Access" is the sum of "Timely availability…," "Location convenient…," "Patient request," and "Speaks patient's language"*

¶*"Physician communication" is the sum of "Physician refers…," "Quality of communication…," "Shares my medical record…," and "Works in my hospital…"*

cialist RR=2.11, 95% CI=1.37–3.08) (Table 4). The opposite case held for reasons in the category of "physician communication" (RR=0.69, 95% CI=0.49–0.91), which medical specialists were less likely to cite as reasons than PCPs. The differences seen between medical and surgical specialists versus PCPs remained when examining the "shares my medical record system" reasons (medical specialist RR=0.13, 95% CI=0.03–0.40, surgical specialist RR=0.26 95%, CI=0.05–0.78).

DISCUSSION

We assessed the reasons for choosing specific physicians for referrals among a diverse sample of primary and specialty care physicians affiliated with a large physician organization. We found that physicians of all specialties most frequently cited "my patients have good experiences with this physician" among the choices given as the most important reason for selecting that physician besides clinical expertise. However, factors including whether a physician "works in my hospital" or "shares my medical record" were also commonly cited. Specialists differed from PCPs in the reasons for choosing referral partners. This finding is notable in light of our findings that many referral relationships exist outside of the PCP-specialist axis.

Much of the literature exploring the referral process has focused on PCPs as the sole source for referrals,[4,12–14] consistent with the role of PCPs as coordinators of care.[24] The substantial proportion of referral relationships cited by specialists, however, shows that specialists also influence the mix of physicians that a patient sees. Moreover, there were substantial differences in reasons for referrals by specialty, suggesting that interventions to influence referral practices will need to be tailored by specialty.

Our results show that physicians choose colleagues for referrals based on many reasons, dominated by respondents' perception of their colleagues' interactions with patients, consistent with a prior study of community-based primary care physicians.[12] That study found that "medical skill" was by far the most highly ranked reason among primary care physicians for choosing referral partners, with 87.5% of respondents giving it "major" importance, versus 59.2% respondents for the second most highly ranked reason, "previous experience with specialist."[12] One possible explanation for the prominence of the "patient experiences with MD" category in our study is that physicians in our survey were looking for the closest proxy to clinical skill they could find, since we asked about reasons besides clinical skill. This may also reflect the strong tendency for physicians to think of their referral colleagues as the most capable physicians within their professional network, even if their referral choices are influenced by other factors. It is notable that the least-cited category of responses concerned "patient access," which may reflect that physicians are better at considering patient clinical needs than issues related to access and convenience that may also be important to patients.[25,26]

This study also reveals differences among the reasons for referring to colleagues for physicians in different specialties. After adjustment, we found that PCPs were more likely to cite reasons related to "physician communication" than medical specialists. The two most prominent reasons in this category displaying this difference are "works in my hospital or practice" and "shares my medical record system." This most likely reflects the focus of PCPs on coordination of care and communication with other physicians. The PCPs citing "shares my medical record system" may reflect the contribution of electronic health records to quality and efficiency of care[27] and easy access to patient's documentation for integrating the care a patient has received. Surgical specialists rarely cited this reason, likely because the episodic nature of their clinical encounters does not rely as much on having longitudinal access to all clinical information.

This study has several limitations. First, despite the high response rate,[28] the potential for non-response bias exists. Second, we studied a single academic physicians' organization in a region with a very high density of specialist physicians and where almost all physicians use electronic medical records.

Table 4. Adjusted Relative Risk of Reasons for Referral Cited by Specialty of Respondent

Reasons for referral	Adjusted relative risk (95% CI)*		
	Medical specialists vs. PCP	Surgical specialists vs. PCP	Surgical specialists vs. medical specialists
Patient experience with physician	1.10 (0.99–1.24)	1.08 (0.96–1.23)	0.98 (0.87–1.11)
My patients have good experiences with this physician	1.06 (0.87–1.25)	0.97 (0.78–1.18)	0.92 (0.74–1.15)
Physician has good patient rapport	1.97 (1.21–2.94)	2.11 (1.37–3.08)	1.10 (0.71–1.68)
Physician communication	0.69 (0.49–0.91)	0.83 (0.62–1.05)	1.21 (0.84–1.75)
Works in my hospital or practice	0.67 (0.37–1.08)	1.29 (0.78–2.03)	2.04 (1.09–3.54)
Quality of communication with me	0.70 (0.38–1.12)	0.63 (0.33–1.06)	0.95 (0.44–1.83)
Shares my medical record system	0.57 (0.25–1.11)	0.13 (0.03–0.40)	0.26 (0.05–0.78)
Physician refers to me		N/D†	
Patient access	0.79 (0.51–1.12)	0.65 (0.40–0.98)	0.85 (0.48–1.42)
Location convenient for patient	1.40 (0.76–2.39)	1.05 (0.50–1.88)	0.77 (0.38–1.4)
Timely availability of appointments	0.52 (0.21–1.04)	0.38 (0.12–0.91)	0.88 (0.19–2.65)
Patient request	0.55 (0.10–1.85)	0.20 (0.01–0.98)	0.47 (0.03–2.4)
Speaks patient's language		N/D†	
Other	3.26 (1.36–6.34)	2.10 (0.74–4.64)	0.69 (0.25–1.48)

Bold values indicate adjusted relative risks for which the null hypothesis of relative risk of 1.0 is rejected at the 0.05 level of significance
CI=confidence interval, PCP=primary care physician
**Relative risks were calculated from a multivariable logistic regression model with the outcome of citing each individual reason as the most important factor for referral and respondent specialty as the main predictor variable. Each relative risk was adjusted for respondent sex, age, race, number of clinical days worked per week, practice size, and hospital affiliation*
†Due to the small sample size of respondents choosing these categories, the GEE for the logistic models may not have well-defined solutions, and so estimates are not available

These factors likely influence how our survey population chooses referral partners from among many possible physicians. Therefore, future research should aim to replicate these findings in other physician populations.

In addition, we assessed physicians' professional networks using data from Medicare patients, who necessarily represent a subset of the patients seen by providers. This potentially limits our ability to assess all possible referral connections among the physicians in our sample. However, in the absence of an all-payer database, Medicare claims represent the most comprehensive sets of claims available. Lastly, we were only able to assess the reasons for referral among a small sample of referral relationships for each respondent. We nevertheless randomly sampled the relationships presented to respondents in their rosters, which we believe minimizes selection bias among the relationships we analyzed from respondents.

In conclusion, we assessed the reasons for referral to specific colleagues among a sizable, diverse sample of physicians in a large, academic physician organization. We found that a significant proportion of specialists' relationships to other specialists involve referrals, bypassing PCPs. In addition, we observed that physicians were primarily concerned with patients' experiences with their colleagues when referring to another physician (after excluding "clinical skill" as a criterion). However, we found that PCPs and specialists differed in their reasons for choosing colleagues as referral partners. In particular, PCPs were more likely to be concerned with aspects of physician communication and patient access than specialists. To our knowledge, this study is the first to explore differences in the referral decisions between primary care and specialist physicians. These findings can be of particular use for administrators looking to focus patient care within their organization and create policies that aim to modify physicians' referral practices.

Contributors: *We gratefully acknowledge Georgina Barahona for research assistance, and Laurie Meneades for expert data management and technical support.*

Funders: *Supported by a grant from National Institute of Aging (P-01 AG-031093). Mr. Barnett's effort was supported by a Doris Duke Charitable Foundation Clinical Research Fellowship and a Harvard Medical School Research Fellowship.*

Conflict of Interest: *None disclosed.*

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APPENDIX TABLE

Table 5. Characteristics of Respondents and Non-respondents

		Study cohort (N=243)	All respondents (N=386)		Non-respondents (N=230)	
		%	%	p-value*	%	p-value*
Sex	Male	64	68	0.03	71	0.49
	Female	36	32		29	
Race†	White	84	84	0.96	N/A	
	Non-white	16	16			
Hospital	Academic center	88	88	0.86	78	<0.001
	Other	12	12		22	
Specialty	PCP	36	28	<0.001	18	0.055
	Medical	36	41		48	
	Surgical	25	25		28	
	Other	3	7		6	
Practice size†	Solo or 2-physician	14	14	0.57	N/A	
	3–10 physicians	35	33			
	11–50 physicians	32	34			
	>50 physicians	19	19			
Clinical days per week†	0–1	30	27	0.03	N/A	
	1.5-3	24	34			
	3.5 or more	45	39			
Years since medical school graduation	Mean (SD)	26.5 (10.9)	25.7 (10.8)	0.051	28.9 (10.7)	<0.001
	Median (IQR)	25 (18–34)	24 (16–34)		27 (21–37)	

*P-values calculated using a two-sample t-test or c^2 test, as appropriate and represent comparison of "All Respondents" (see * note below) and Non-respondents to study cohort. (IQR=interquartile range, PCP=primary care physician, SD=standard deviation)*

**Respondent characteristics taken from survey responses for respondents and from AMA Masterfile or physicians' organization database for non-respondents*

†*Race was missing for 1 respondent, practice size for 4 respondents and clinical days per week for 4 respondents. Missing data were not included in calculations of percentages for each category*