ORIGINAL RESEARCH

The Influence of Research Compensation Options on Practice-based Research Network (PBRN) Physician Participation: A North Texas (NorTex) PBRN Study

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Objective: **To study the effect of two compensation approaches, continuing medical education (CME) credits (5 hours) or monetary ($150), on the participation rate of a physician needs assessment study.**

Methods: **Physicians representing family medicine, internal medicine, pediatric, and geriatrics specialties, and practicing in ambulatory primary care clinics affiliated with the North Texas Primary Care (NorTex) PBRN clinics, were recruited to complete a survey relevant to their subspecialty and to conduct a self-audit/abstraction of five medical records. Physicians were recruited from four health care systems, and the recruiting methods varied by system. Study outcome was the rate of study completion by type of incentive.**

Results: **One hundred five of 211 (49.8%) physicians approached to participate gave consent and 84 (39.8%) completed the study. There was no difference in the number of physicians randomly assigned to monetary compared with CME compensation for giving consent to participate (adjusted odds ratio = 1.42, confidence interval = 0.69, 2.93). However, physicians in the monetary compensation group were more likely to complete the study after giving consent (adjusted odds ratio = 4.70, confidence interval = 1.25, 17.58). This monetary effect was also significant from the perspective of all physicians approached initially (adjusted odds ratio = 2.78, confidence interval = 1.16, 6.67).**

Discussion: **This study suggests that future PBRN investigators should receive monetary compensation for the opportunity cost of adding research activities to their already busy practices. This compensation may be especially vital for PBRNs to complete more ambitious projects requiring a significant time commitment from the participating physicians. (J Am Board Fam Med 2011;24:562–568.)**

Keywords: **Physician Behavior, Physician Compensation, Practice-based Research, Primary Care, Research Methods**

Between 1994 and 2004, the number of active primary care practice-based research networks (PBRNs) in North America nearly quadrupled, and the number continues to expand.[1] PBRNs have been recognized as important tools to translate research findings into practice.[2–5]

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Clinicians have been observed to join PBRNs for intellectual stimulation and a desire to be part of a research group, but leave for a variety reasons including practice changes and the additional burdens associated with research.[6] Burdens include shortage of time, high practice volume, insufficient training in research techniques, and obstacles posed by stringent institutional review board regulations.[3] Similar barriers exist for physician support staff.[4] Support for general PBRN participant growth and research acculturation, such as meetings and workshops, has also been recognized as an important contributor to network success.[7]

Surveys in the early days of PBRNs found that participation was improved with support from experienced researchers and colleagues.[5] Time was the second most important consideration, whereas financial compensation was found to be least important. CME credit has been used as compensation to increase participation in some PBRN studies[8,9] and to attend PBRN meetings.[10] We identified no study that directly measured the effect of different compensation approaches on PBRN participation by physicians.

The purpose of this study was to investigate the relative impact of direct financial compensation compared with CME credits on physician participation in a research project in a relatively new primary care PBRN.

Methods

Overview

This study was a randomized controlled trial nested within the North Texas Primary Care (NorTex) Needs Assessment Study, which examined the knowledge and practices of local primary care physicians with respect to cardiovascular care, immunizations, cancer screening, and pediatric care. The needs assessment consisted of two parts: a one-time survey that could be completed on-line or on paper and five self-directed random chart extractions.

All physician subjects were primary care providers (family medicine, pediatrics, internal medicine, and geriatrics) who practiced in an outpatient setting. They were asked to complete a survey relevant to their subspecialty and to conduct a self-audit of five medical records. These five records consisted of one patient 18 years of age or younger, one patient between 19 and 49 years of age, two patients between 50 and 64 years of age, and one patient at least 65 years of age. Pediatricians were asked to complete five charts on patients 18 years of age and younger, and physicians whose practice only included adult patients were asked to review two charts for patients between 18 and 49 years of age. The survey was estimated to take approximately 30 minutes to complete for family physicians and internists and 15 minutes for pediatricians. The medical record reviews were expected to take approximately 30 to 60 minutes to complete. The physicians were asked to return the survey and chart reviews within 2 weeks. Reminders were given if this deadline passed, using several modalities including fax, e-mail, telephone, and in-person visits.

Physicians who participated in the study were recruited from four different systems or physician groups. Each of these systems had a champion, or lead contact, who was a co-investigator on the project. These champions were responsible for working with the primary research coordinator (RC) to select the best methods of recruiting physicians from their system. Face-to-face meetings were held with the PI and all system champions on three occasions to ensure that study recruitment was progressing and to address any concerns. The following is a general description of each physician system and the method utilized for recruitment.

Physician Systems

Academic Center A

This group comprised both physicians associated with an academic institution and physicians in private practice. The RC contacted each physician directly for recruitment. The RC referred to the system champion by name when recruiting, but worked directly with the potential physician participants. The RC was responsible for all contacts, consenting, and ensuring study completion.

Academic Center B

This group included community-based clinics associated with a large county hospital clinic system. The champion for this system introduced the RC to a site administrator or lead physician at each clinic. This person then helped the RC make initial contact with potential physician participants at each clinic and helped with follow-up for obtaining consent and receiving study components.

Community Hospital System With Family Medicine Residency

This group included outpatient primary care clinics associated with a different large county hospital system. The champion at this system helped the RC make first contact with individual physicians. This generally included going with the RC to visit the clinics and giving a short presentation of the study objectives and methods. After initial contact, the RC followed up with the physicians directly. The RC was responsible for recontacting, consenting, and ensuring study completion. The champion was available to help with any of these steps as necessary.

Children's Hospital and Health Care System

This group included outpatient clinics associated with a pediatric hospital system. The champion, who was the Medical Director of Research for the entire system, recruited physicians personally and instructed the system's in-house research coordinator conduct all follow-up. The overall study RC was not permitted to contact or follow-up with physician participants directly.

Sample Size, Randomization, and Consent

We identified no previous research that could be used to conduct a power analysis. We attempted to recruit 250 physicians into the study from four strata categories, each stratum representing one of the health systems described previously. This number represented almost all physicians in the network, though a handful were still being introduced to the network during the study and were not approached. This timing issue and budgetary constraints meant that our participants are best described as a convenience sample.

Randomization was achieved at the clinic level because the investigators believed that knowledge of the compensation differences would be an important confounder. NorTex member clinics in each stratum were randomly assigned to either be offered CME or monetary compensation, using the randomization function of SPSS. This randomization process occurred before approaching the clinics and clinicians and before obtaining consent.

After the RC or investigator physician explained the study, informed consent for participation in the needs assessment study was sought, including knowledge that the participant would receive compensation for their time and effort. The physician only knew the type of compensation for that clinic and did not know another method of compensation was available. Investigators were unblinded throughout the study. Compensation for the physician's time and effort consisted of 5 hours of CME credit or $150 paid for completing the survey and medical record reviews. Physicians received compensation only when they completed both the survey and chart reviews.

Outcome and Explanatory Variables

There were three outcome variables of interest: whether a physician approached to participate would give consent, whether a physician who consented actually completed the study instruments, and whether a physician approached would complete the study instruments. In all cases, the explanatory variables of interest were the type of compensation (monetary or CME) and health system affiliation.

Statistical Analysis

Because the type of compensation was randomized at the clinic level, observations (physicians) within each clinic were assumed to be dependent. Accordingly, separate two-level hierarchical logistic regression models were used to assess participation and completion of a PBRN research project.

To determine whether physicians receiving monetary compensation were more likely to either consent to or complete a PBRN research project, the odds ratios (OR) along with the corresponding 95% confidence intervals (CI) were computed. Because it was suspected that health system affiliation could influence the outcome, the models were adjusted for this variable. Thus, both crude and adjusted ORs were computed. The crude ORs were still adjusted for the hierarchical structure of the data but not for the other explanatory variable. This was necessary because the traditional crude OR assumes that the observations are independent, and hence it would not have been meaningful for this study design. All modeling was conducted using MLwiN version 2.1.[11] The ORs and CIs were computed manually, using the output from MLwiN.

Human Subjects

This study was approved by the institutional review boards of all four institutions.

Table 1. Demographics of Physicians Who Completed the Survey

Number of Physicians Who Filled Out the Survey, n = 90	Mean (SD)
Survey type administered	
Adult survey only	21 (23.3)
Pediatrics survey only	33 (36.7)
Both adult and pediatric survey	36 (40.0)
Survey format	
Electronic	15 (16.7)
Paper	75 (83.3)
Specialty	
Family Medicine	34 (37.8)
Internal Medicine	16 (17.8)
Pediatrics	33 (36.7)
Geriatrics	5 (5.6)
Sex	
Male	46 (51.1)
Female	43 (47.8)
Race	
Caucasian	48 (53.3)
African American	7 (7.8)
Asian	25 (27.7)
Other	9 (10.0)
Ethnicity	
Hispanic	13 (14.4)
Non-Hispanic	75 (83.3)
Age	46.3 (10.1)
Years in practice	14.5 (9.9)

Results

Demographics of the participants are shown in Table 1. Demographics were only available for physicians who completed the survey, because demographic questions were included in the study instruments (six subjects completed the survey but not the medical record). Study completion by compensation method is presented in Table 2. A total of 211 physicians were contacted for the study, and 105 (49.8%) consented to participate. The research team decided to cease further recruitment attempts at this number of subjects because of time and budgetary constraints and because of feedback from the RCs who thought that additional contact would not be fruitful for many clinics.

Table 3. Crude and Adjusted Odds Ratios for Level of Participation in Practice-based Research Network (PBRN) Research Project

	Crude Odds, Ratio (95% CI)	Adjusted Odds, Ratio (95% CI)
Consented after being approached to participate: Compensation		
CME (reference)	1.00	1.00
Monetary	1.26 (0.62, 2.53)	1.42 (0.69, 2.93)
Completed project after giving consent: Compensation		
CME (reference)	1.00	1.00
Monetary	4.60* (1.29, 16.38)	4.70* (1.25, 17.58)
Completed project after being approached: Compensation		
CME (reference)	1.00	1.00
Monetary	2.46* (1.07, 5.66)	2.78* (1.16, 6.67)

*Significant at the 0.05 level.
CME, continuing medical education.

The ORs along with the corresponding 95% CIs for each participation phase (approach to consent, consent to completion, approach to completion) are presented in Table 3. Physicians who were given monetary compensation were not more likely to give consent to participate (adjusted OR = 1.42, CI = 0.69, 2.93), but those who consented were more likely to complete the project (adjusted OR = 4.70, CI = 1.25, 17.58). From the perspective of all physicians who were initially approached, monetary compensation also resulted in a higher completion rate (OR = 2.78, CI = 1.16, 6.67).

Generally, system affiliation was not a significant factor in study completion, but physicians affiliated with a children's health care system were 3.8 times more likely to consent to participate in the project (adjusted OR = 3.80, CI =

Table 2. Study Material Completion Rate by Compensation Method

	Total Number n (% of Approached)	Compensation	
		Monetary n (% of Approached)	CME n (% of Approached)
Approached	211	97	114
Consented	105 (49.8)	52 (53.6)	53 (46.5)
Completed	84 (39.8)	48 (49.5)	36 (31.6)

1.15, 12.57), although this did not result in an improved completion rate (adjusted OR = 2.24, CI = 0.58, 8.60). Children's system physicians were the only subjects approached by one of their system's physician administrators. The total number of physicians approached in the children's system was less than the other systems (25 physicians for children's versus 55 to 73 for the other three systems).

Discussion

We found that monetary compensation, compared with CME credits, was associated with an increased rate of completion of research work among primary care physicians in a PBRN. This effect was noted in all physicians who were approached to participate and in the subset of those who gave consent to participate. Direct recruiting by a physician administrator of physician subjects was also associated with improved consent to participate in the study but did not lead to increased completion of the study.

Our findings add weight to Hahn's view that "engaging in practice-based research has considerable opportunity costs for the physician directly and also indirectly for the physician's system of care. Unless these costs are recognized and accounted for, it will be difficult or impossible to motivate widespread and sustainable participation in future practice-based research enterprises."[12] Although monetary compensation has been recognized as a potential source of undue influence,[13] reviewers on the subject have concluded that money offered to research subjects is ethical if it is in proportion to the time and contribution of the research subjects.[14]

Primary care PBRNs have successfully published studies requiring a minimal amount of physician time, such as brief surveys,[15] medical record reviews by research assistants,[16] and card studies.[17] Primary care PBRNs have not had as much success with more rigorous study designs such as longitudinal cohort studies and randomized controlled trials, which require a higher level of participation from the local physician to provide information and informed consent to their patients who are potential research subjects, plus the extensive efforts of the research team to maximize long-term follow up and study completion.[18] A randomized trial of dyspepsia treatment conducted in a family medicine setting only recruited 8% of network physician members to enroll subjects, and some of those participants recruited no patients.[19] Participating physicians reported that financial considerations were not important, but this information was not available from the nonparticipants. Our study suggests that explicit recognition and compensation of the work required of participating physicians may be needed to accomplish more ambitious research endeavors, whether the physicians are the study subjects or if they contribute time and effort by working with patient study subjects.

The personal connection between the researcher and physician in practice has been observed to increase participation in clinical research.[18,20,21] Recruiting into a network by an esteemed colleague was important for the growth of one of the earliest PBRNs.[21] Our results suggest that a colleague in a position of authority in a health care system may increase agreement to participate in research but may not result in an improved completion rate.

Limitations

We only used one monetary compensation level and one amount of CME credit hours. Greater amounts of each could influence participation and lesser amounts may have no adverse effect. We did not include a control group that did not receive compensation; therefore, we have no way of knowing if either type of compensation was better than no compensation or if either type of compensation influenced the participants' answers on the survey or medical record. Our study was also limited in that we did not measure other reasons physicians may have withdrawn from the study, including changes within the practice, the additional burdens imposed by research, and lack of support from staff and medical colleagues.[21] The lack of initial power calculation and our inability to approach all physicians in the PBRN were also limitations.

We were not able to include other predictors of consent and completion in our analysis. We only collected data from those who completed the study because completing an instrument on self-reported demographics was one of the participants' tasks. Therefore, we cannot comment on other participation influences such as age, sex, years of practice, affiliation, or specialty. We also did not ask about other factors known to increase participation such

as personal interest in the research topic,[22] an assessment of the relevance of the research question,[23] and the participants' personal connection to the researchers.[20,24]

Another limitation was that variation in recruiting methods was not one of our a priori hypotheses. The outlier system consisted entirely of pediatricians. It is possible that characteristics of pediatricians or that health care system explains the difference in consenting success, though it is unlikely. The investigator from the children's system, who recruited the network's physicians to participate in the study, has a system-wide administrator role that may have influenced participation. Another contributor could be the fact that the pediatricians' survey was shorter (15 minutes versus 30 minutes) and the chart reviews were likely less time-consuming.

Implications

We believe our findings justify future PBRN researchers requesting and receiving grant funds to compensate participating physicians for the opportunity cost of adding research to their already busy practices, though our data do not indicate the most appropriate amount. Our data suggest the hypothesis that it may be beneficial for funders to cover the time of study team physician investigators to personally recruit participating physicians. Funding has been recognized as a barrier to PBRN research both in the United States[2] and worldwide[25]; therefore, our results may be generalizable to countries outside the United States.

Future research should further explore other possible payment mechanisms for the opportunity cost of research beyond flat fees, such as time- or task-based compensation. Future research should also more rigorously measure the opportunity cost of clinical research on the clinic operations, such as nurse and administrator time, and its impact on research participation.

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