

## ORIGINAL RESEARCH

# Reports of Persistent Change in the Clinical Encounter Following Research Participation: A Report From the Primary Care Multiethnic Network (PRIME Net)

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**Purpose:** Following anecdotal reports of unexpected patient and/or clinician behavior change in the primary care encounter in a previous study, we conducted this study to learn more about the short- and long-term effects on clinician and/or patient behavior from participation in a practice-based research network (PBRN) study.

**Methods:** Clinicians in two PBRN studies of *Acanthosis nigricans* were surveyed and interviewed 3 to 6 months following one study and surveyed 3 to 5 years following a second study. We gathered data on clinicians' reports of behavior change in the encounter, the persistence of those changes, and the likely causes of reported changes.

**Results:** Eighty-six percent of clinicians in the short-term and 79% in the long-term samples reported more frequent diagnostic efforts, and 68% and 54%, respectively, reported more frequent preventive counseling after participation in the studies. Interview data suggested that several factors contributed to this reported behavior change: increased clinician knowledge, availability of a feasible tool to support counseling, change in patient receptivity/motivation, and creation of a new context for counseling.

**Conclusions:** Reports of behavior change in the primary care encounter associated with a PBRN study suggest that PBRNs may be effective vehicles for education, translation, and practice change in addition to their value in research. (J Am Board Fam Med 2011;24:496–502.)

**Keywords:** Clinician Behavior, Patient Behavior, Practice-based Research, Primary Health Care

In the primary care setting, changing unhealthy behaviors in their patients is one of the most challenging tasks clinicians face. Theoretical models

can guide approaches to inducing patient behavior change,<sup>1–3</sup> but studies have shown limited success in actually changing behavior. Somewhat ironically, efforts to change physician behavior have been similarly unproductive. A large scientific literature reports the limited and often short-term effects of various strategies to modify clinician be-

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**Note:** The instruments are available by request to the corresponding author.

havior, despite theoretical models guiding interventions.<sup>4–12</sup>

With these considerations in mind, we were intrigued by anecdotal reports of behavior change occurring in primary care encounters as a result of participation in a practice-based research network (PBRN) study. In a study of the prevalence of Acanthosis Nigricans (AN, a skin condition often associated with hyperinsulinemia) and diabetes risk factors, several clinicians reported that making a diagnosis of AN resulted in changes in the dynamics of the encounter.<sup>13</sup> Reportedly, more time was spent on preventive counseling than would have been the case without diagnosing AN.

A subsequent study of AN provided the opportunity to further explore reported effects of PBRN study participation on the primary care encounter—an understudied, yet potentially important aspect of PBRNs. Building on the original study in the RIOS Net PBRN, the PRIME Net consortium of PBRNs undertook a study of AN prevalence that included clinician education about AN.<sup>14,15</sup> As part of this research, we designed a study to gather observations from clinicians about the effects of diagnosing AN on the patient encounter.

## Methods

### Study Design

We used a mixed-method design with clinician surveys followed by in-depth interviews to examine clinician perspectives on the impact of participating in the PBRN study on the primary care encounter.

### Study Setting

We conducted the study in PRIME Net (Primary care MultiEthnic Network), a consortium of eight primary care PBRNs serving predominantly minority and underserved populations throughout the United States. Clinicians affiliated with RIOS Net (Research Involving Outpatient Settings Network, New Mexico), CaReNet (Colorado Area Research Network, Colorado), SERCN (Southeast Regional Clinicians Network, 11 Southeastern states), and SPUR-Net (Southern Primary care Urban Research Network, Houston, Texas) participated in this study. Institutional review boards associated with each network approved the study.

### Original Prevalence Studies

Participating clinicians gathered data on prevalence of AN, diabetes, and diabetes risk factors for all consenting patients seen over 1- to 2-week data collection periods in 2002 to 2004 (RIOS Net study) or 2007 (PRIME Net study).<sup>13,14</sup> The study protocol required data collection and AN diagnosis at the time of the patient encounter but included no patient intervention.

### Follow-Up Clinician Survey

#### Sample

We invited all clinicians who participated in the two prevalence studies to complete a survey about their observations 3 to 6 months (PRIME Net study) or 3 to 5 years (RIOS Net study) after they had completed data collection for the prevalence studies, providing both short- and long-term views of the effects of participation.

#### Data Collection

The survey instrument was composed of 13 items inquiring about familiarity with AN before the study; how the study affected clinician behavior in the encounter, and the value of diagnosis of AN in preventive counseling.

We distributed the survey electronically using Opinio® survey software. Drawings for \$75 gift certificates were offered to those responding by sequential deadline dates. We sent five follow-up e-mail reminders and up to two postal reminders to nonrespondents at biweekly intervals.

### Clinician Interviews

#### Sample

Beginning 1 month following completion of the PRIME Net prevalence study, four clinicians from each participating network who had diagnosed a minimum of four patients with AN were purposively sampled (based on broad representation of practice settings) for interviews. (We anticipated a sample size of 16 clinicians would lead to data saturation.)

#### Data Collection

A semistructured interview guide explored clinician experiences and patient responses to the diagnosis of AN. Audio recordings of the interviews were transcribed and deidentified.

**Table 1. Demographics of Clinician Survey Samples**

Survey Items	Short-Term (3 to 6 Months) Follow-Up Survey (PRIME Net) N = 73	Long-Term (3 to 4 Years) Follow-Up Survey (RIOS Net) N = 72
Clinician background*		
Family Medicine	43	40
Pediatrics	3	18
Internal Medicine	16	6
Nurse practitioner/physician assistant	9	7
Network affiliation*		
RIOS Net	19	72
SPUR-Net	27	—
SERCN	15	—
CaReNet	11	—
Years since graduation, n (%)		
<5	—	3 (4)
5 to 10	—	19 (27)
10 to 20	—	24 (34)
>20	—	25 (35)
Years since residency, n (%)		
<5	10 (14)	—
5 to 10	15 (21)	—
11 to 20	12 (16)	—
>20	17 (23)	—
Residents, midlevel providers	19 (26)	—

\*Totals vary due to missing responses.

PRIME net, Primary Care Multiethnic Network; RIOS Net, Research Involving Outpatient Settings Network, New Mexico; SPUR net, Southern Primary care Urban Research Network, Houston, Texas; SERCN, Southeast Regional Clinicians Network, 11 Southeastern states; CaReNet, Colorado Area Research Network, Colorado.

## Data Analysis

### Surveys

We analyzed survey data using SAS version 9.1.3. We calculated descriptive statistics and compared response frequencies between the short- and long-term follow-up groups, using the Fisher exact test.

### Interviews

Each network's interviewer read their respective four transcripts. The lead qualitative researcher (AS) read the entire set and developed an initial set of analytic themes for the analysis team to review. They convened, along with other members of the research team who reviewed transcripts, to reach consensus on the interpretive framework. All transcripts were imported into NVivo for coding, facilitating text retrieval and further refinement of the thematic findings. Finally, the qualitative findings were reviewed together with the survey results to provide an integrated results picture.

## Results

### Demographics

Seventy-three (85%) PRIME Net clinicians and 72 (75%) RIOS Net clinicians completed the survey. Clinician samples were similar in the two study groups (Table 1). Family physicians comprised the majority of clinicians in both studies, and pediatricians were more common in the earlier study group. All 16 PRIME Net clinicians approached for interview participated.

### Reports of Behavior Change in the Encounter

Most clinicians reported that following participation in the AN prevalence study, they more commonly examined a patient's neck for AN, diagnosed AN more often, spent more time counseling patients with diabetic risk factors, and discussed AN with their colleagues (Table 2). These reported behavior changes persisted for up to 3 to 5 years after the original RIOS Net AN study. A lesser proportion, but

**Table 2. Clinician Reports of Change in the Encounter**

Survey Items*	Short-Term Follow-Up Survey (3 to 6 Months) N = 73 n (%)	Long-Term Follow-Up Survey (3 to 4 Years) N = 72 n (%)	P Value† of Test for Difference Between Short-Term and Long-Term Survey Results
Were you aware of the association of Acanthosis Nigricans (AN) with hyperinsulemia and/or diabetes before training for this project?			
Yes	60 (82%)	57 (79%)	0.81
No	10 (14%)	10 (14%)	
Not sure	3 (4%)	5 (7%)	
As a result of my participation in this project, I more commonly check the back of a patient neck for AN.			
Yes	63 (86%)	57 (79%)	0.32
No	7 (10%)	13 (18%)	
Not sure	3 (4%)	2 (3%)	
As a result of my participation in this project, I am diagnosing AN more often.			
Yes	50 (68%)	47 (65%)	0.90
No	17 (23%)	18 (25%)	
Not sure	6 (8%)	7 (10%)	
As a result of my participation in this project, I more commonly inquire about diabetes risk factors among my patients.			
Yes	44 (60%)	38 (54%)	0.33
No	27 (37%)	27 (38%)	
Not sure	2 (3%)	6 (8%)	
As a result of my participation in this project, I spend more time counseling patients who have diabetes risk factors about diet, exercise, or weight control.			
Yes	50 (68%)	39 (54%)	0.13
No	20 (27%)	25 (35%)	
Not sure	3 (4%)	8 (11%)	
As a result of my participation in this project, I have discussed AN with my colleagues.			
Yes	44 (60%)	51 (74%)	0.08
No	26 (36%)	18 (26%)	
Not sure	3 (4%)	0 (0%)	
I find the identification of AN provides a good opportunity to address diabetic risk factors with my patients.			
Yes	67 (92%)	67 (96%)	0.44
No	4 (5%)	1 (1%)	
Not sure	2 (3%)	2 (3%)	
I find the identification of AN leads a patient to be more receptive to diabetic risk factor counseling.			
Yes	49 (67%)	49 (69%)	0.09
No	5 (7%)	0 (0%)	
Not sure	19 (26%)	22 (31%)	

\*Totals may vary due to missing responses on surveys or categorization as other.

†Fisher exact test.

**Table 3. Possible Reasons for Behavior Change Following Participation in Practice-based Research Network (PBRN) Study: Supporting Clinician Comments in Qualitative Data**

Reasons	Explanatory Comments by Clinicians
Increase in clinician knowledge about AN	“The AN training module was useful, and the prompting to check for AN has provided a good opening for talking to patients at risk for diabetes.” “(Participation in the project) increased my knowledge and gave me some specific tools to identify prediabetes and to use to begin talking to/counseling patients.”
AN as a feasible tool to assist counseling	“I think it’s such an easy thing to do that I probably look for AN in almost everybody. You know, just when you’re listening to their lungs, you just flip up their hair and look quickly.” “I think it’s enhanced my clinical skills. And it’s also a really good segue into counseling people on their risk for diabetes and to help them modify their lifestyle and their risk factors.”
Change in patient receptivity/motivation for counseling	“When people found that they had a skin change that you could identify as a risk, they were very keen to that. It was like you had a flag that was being held up and people would say, ‘Oh, wow’.”
Context of the clinical encounter	“I now look for it more regularly, particularly in people who have other risk factors for diabetes. And then I use that in the context of my counseling, ‘Look, you already have some signs of insulin resistance.’ So, it actually enhances my ability, I think, to motivate them to change their behavior.”

AN, Acanthosis Nigricans.

still a majority, reported that they more commonly inquired about diabetes risk factors.

The qualitative interviews found that clinicians across these diverse settings consistently expressed greater awareness of AN, and, consequently, more routinely look for this marker during clinical encounters. As one clinician stated,

“I was not promoting disease prevention. I think preventive medicine is what I would rather focus on; this project helped push me in that direction.”

### **Possible Factors Contributing to Change in the Clinical Encounter**

We explored possible reasons for the reported behavior changes in the survey comments and the interviews. Four major themes emerged that explain the change in behavior (Table 3):

#### *Increase in Clinician Knowledge About AN*

Clinicians in both groups reported that they were aware of AN and its association with hyperinsulinemia and/or diabetes before the study (Table 2). Nevertheless, data from the interviews (Table 3) suggested that increased knowledge about AN may have contributed to the reported change in at least some of the clinicians.

#### *Diagnosis of AN Provides a Feasible Tool to Assist Patient Counseling*

In both groups, clinicians overwhelmingly agreed (92% short-term, 96% long-term) with the statement that the identification of AN provides a good opportunity to address diabetic risk factors with patients. In the interviews, there was consensus that diagnosing AN provided a feasible tool for integrating diabetes risk factor counseling into the clinical encounter (Table 3).

#### *Diagnosis of AN Changes Patient Receptivity/Motivation*

Large percentages of clinicians also agreed with the statement, “identification of AN leads my patients to be more receptive to diabetic risk factor counseling” (67% short-term; 69% long-term). In the interviews, clinicians attributed this heightened patient receptivity to the influence of AN as a physical sign in contrast to a more abstract numerical finding (eg, cholesterol level) (Table 3). A frequently reported observation among the clinicians was that finding AN on the neck of a child led to a strong parental response.

“... you know, like moms would say, ‘Oh, yeah, I tried to rub that off.’ Then if you say, ‘Well, it might be related to (diabetes risk),’ then they’re like, ‘Oh, my God, I really have to change the diet.’”



### *AN Can Easily Be Incorporated Into the Context of the Clinical Encounter*

Some clinicians emphasized the use of AN diagnosis for counseling in strategically appropriate situations. A common example is cited in Table 3.

## **Discussion**

Building on earlier anecdotal reports that participation in a PBRN study changed the dynamics of the primary care encounter, this study reports on persistent change in the primary care encounter as a result of participation in PBRN studies. In surveys and in-depth interviews conducted up to 5 years after a study, clinicians reported increased attention to a skin marker for diabetes risk and greater diabetes preventive counseling as a result of PBRN study participation.

The marked and sustained degree of change, albeit from self-report data, contrasts with results of a large number of studies aimed at both clinician and patient behavior change.<sup>4–12,16–19</sup> Broadly speaking, any persistent effects on clinician behavior have been limited, with effect sizes in single-digit percentages. Similarly discouraging results have been shown in studies designed to change patient behavior.

### ***Mechanism of Behavior Change***

Our study design does not clarify how much of the reported changes in the primary care encounter are due to clinician behavior change, patient behavior change, or both. Several factors could have contributed to the reported changes: (1) focus of the PBRN study on an area of concern for clinicians; (2) interactive clinician education (web, in-person outreach); (3) rapidly diagnosed condition; (4) “teachable moment”; (5) increased clinician self-efficacy; (6) perceived patient receptivity to counseling; (7) change in patient (or parent) motivation. The reported that changes were not simply an immediate response to the original study environment (ie, Hawthorne effect), since they are reported to have persisted well beyond the study period.

Could changes similar to those reported have occurred as a result of practice-based research outside of the context of a PBRN? Although our study cannot address this question, we note that several components of a PBRN (shared sense of purpose; continuing relationship outside of a sin-

gle study; education, communication, and reporting systems; familiarity of researchers with practice environments; focus of research on areas of clinician interest), while not exclusive to PBRNs, are accomplished more effectively and efficiently through the longitudinal structure of a PBRN.

### ***Published Studies of PBRN Effects on Behavior***

There is very little published literature observing the effects of PBRN participation on clinicians and patients. A key exception is the work by Siegel et al, who studied the persistence of adoption of a PBRN study intervention.<sup>20</sup> One year after the study completion, surveyed PBRN members reported a significant change in use of the intervention compared with the year before the study. Although PBRNs are increasingly being used in trials to test discrete clinical interventions, there is little other information about effects of participation beyond the study period.

### ***Limitations***

The data in this study are self-reported and may be biased by the clinicians’ perceptions of the desired responses. We structured the surveys and interviews to reduce the potential for this bias, but we do not know how effective those efforts were. Direct observation of primary care encounters before and after participation in a PBRN study would be an important next step to understanding the effects of PBRN participation.

We do not know whether the observed effects are generalizable to other study topics, designs, networks, or clinician/patient populations. Nevertheless, external validity is suggested by the consistency of the findings across four PBRNs in diverse geographic and patient population settings.

## **Conclusion**

We encourage others to design studies to examine the short-, intermediate-, and longer-term effects of PBRNs on primary care, its members, and their patients. Closer examination for those effects may reveal unexpected effects and lead to greater understanding of the potential value of research participation generally, as well as the value added by PBRNs.

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