Effect of a Physician-directed Educational Campaign on Performance of Proper Diabetic Foot Exams in an Outpatient Setting

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BACKGROUND: The established guidelines for a diabetes foot examination include assessing circulatory, skin, and neurological status to detect problems early and reduce the likelihood of amputation. Physician adherence to the guidelines for proper examination is less than optimal.

OBJECTIVE: Our objective was to increase compliance with the performance of a proper foot examination through a predominantly physician-directed interventional campaign.

METHODS: The study consisted of 3 parts: a retrospective chart review to estimate background compliance, an educational intervention, and prospective chart review at 3 and 6 months. A properly documented foot examination was defined as assessing at least 2 of the 3 necessary components. The educational intervention consisted of 2 lectures directed at resident physicians and a quality assurance announcement at a general internal medicine staff meeting. Clinic support staff were instructed to remove the shoes and socks of all diabetic patients when they were placed in exam rooms, and signs reminding diabetics were placed in each exam room.

RESULTS: There was a significant increase in the performance of proper foot examination over the course of the study (baseline 14.0%, 3 months 58.0%, 6 months 62.1%; $P < .001$). Documentation of any component of a proper foot examination also increased substantially (32.6%, 67.3%, 72.5%; $P < .001$). Additionally, performance of each component of a proper exam increased dramatically during the study: neurological (13.5%, 35.8%, 38.5%; $P < .001$), skin (23.0%, 64.2%, 69.2%; $P < .001$), and vascular (14.0%, 51.2%, 50.5%; $P < .001$).

CONCLUSIONS: Patients with diabetes are unlikely to have foot examinations in their primary medical care. A simple, low-cost educational intervention significantly improved the adherence to foot examination guidelines for patients with diabetes.

KEY WORDS: diabetes; foot ulceration; foot exam; prevention; physician education.

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Foot complications ranging from corns and calluses to lower-extremity amputation are a significant cause of morbidity and mortality in the 15.7 million estimated diabetics in the United States.¹ Diabetes-related foot complications are a major cause of hospitalization and prolonged hospital stays. Twenty percent of all persons with diabetes in the United States are hospitalized for foot problems.²⁻⁵ In a study conducted by Smith et al., 23% of the total hospital days over a 2-year period were for treatment of diabetic foot problems.⁶ Foot ulcers are an extremely common complication in diabetes mellitus. In a United Kingdom survey of 6,000 patients followed in a diabetes clinic, more than 2% had an active foot ulcer, and 2.5% were status post amputation.⁷ Additionally, prior studies have demonstrated that 70% of diabetic foot ulcers required surgical intervention, and in more than 40% of these interventions, a toe or limb amputation was performed.^{3,8} Furthermore, diabetes is the leading cause of nontraumatic amputations in the United States, accounting for one half of all the nontraumatic lower extremity amputations with an estimated 67,000 diabetes-related lower limb amputations each year.⁹

The economic cost of diabetic foot complications is equally staggering. In 1986, care for chronic skin ulcers accounted for \$150 million of the \$11.6 billion direct total cost related to type 2 diabetes.⁹ The cost of a single lower-extremity amputation related to diabetes in 1992 ranged from \$24,000 to \$27,000 with an average length of hospital stay from 18.4 to 20.3 days.¹⁰ Currently, the total annual cost ascribed to diabetic foot disease is estimated to be more than \$1 billion.⁴

The American Diabetes Association (ADA) consensus group has found that among diabetics, foot ulceration is increased in men, patients with diabetes for more than 10 years, and patients with poor glycemic control or with cardiovascular, retinal, or renal complications.¹¹ The risk factors which predispose toward diabetic foot ulceration have also been well elucidated. These include diabetic neuropathy, peripheral vascular disease (PVD), susceptibility to infection, and biomechanical or musculoskeletal factors. Prior data suggest that the likelihood of amputation is proportional to the number of risk factors present.¹² Peripheral sensory neuropathy is one of the strongest risk factors for both foot ulceration and

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amputation in this population.^{13,14} In the absence of neuropathy, people rarely develop foot ulcers. However, the underlying etiology is usually multifactorial. As demonstrated by Edmonds¹⁵ and Laing,¹⁶ foot ulcers in patients with diabetes usually have mixed ischemic and neuropathic components. Based on current ADA estimates, at least 50% of amputations that occur in diabetics can be prevented through proper foot care.^{2,17-19} Similarly, the factors that predispose diabetics to developing foot ulcers can be easily assessed on a focused physical exam.

In an effort to reduce the number of preventable diabetic foot complications, the ADA¹⁸ and the Centers for Disease Control and Prevention² have outlined recommendations for evaluating for the presence of foot ulcers and the risk factors that predispose to their formation. The ADA currently recommends a comprehensive foot exam at least each year to identify high-risk foot conditions. Diabetics with 1 or more high-risk foot conditions should be evaluated more frequently for the development of additional risk factors, and patients with neuropathy should have a visual examination of the feet at every visit with a health care professional. The exam includes the evaluation of protective sensation, foot structure and biomechanics, vascular status, and skin integrity.¹⁸ Despite the human and economic impact of diabetic foot complications and the proposed guidelines for their prevention, prior studies have failed to show significant compliance on the part of physicians in performing diabetic foot exams as a routine part of diabetic health care. Clinical practice patterns for foot examinations have been assessed on the basis of providers' self reports,^{20,21} chart reviews,²²⁻²⁷ a combination of providers' self-reports with patient corroboration and chart reviews,²⁸ and patient surveys²⁹ (see Table 1).

A 1989 National Institutes of Health survey mailed to primary care physicians found that over 80% of the 1,502 respondents reported performing a "foot exam for infection and ulceration" and "peripheral circulatory and neurological exam" in patients with type 2 diabetes mellitus 1 or more times per year.²⁰ However, studies based on chart review alone reveal a finding of more concern, that as few as 6% of patients have undergone a foot examination in the past year (see Table 1). Only 2 of the studies actually specified the components of a comprehensive foot exam and performed chart reviews to determine compliance.^{22,24}

There have been a several studies attempting to show the effect of various interventions on the performance of diabetic foot exams.^{22,25,27} These studies demonstrated that patient and physician education on diabetes foot complications along with reminders for both patients and physicians dramatically improve compliance rates up to 52% to 94%.^{22,25,27} In the current study, we attempt to determine the effect of a primarily physician-directed intervention on the documentation of proper diabetic foot exams.

METHODS

Setting

The study took place at the outpatient internal medicine clinic at Wilford Hall Medical Center (WHMC) in San Antonio, Texas. This is an Air Force hospital that is the largest training site for internal medicine in the Air Force. There are 54 residents in our training program and 16 general internal medicine staff physicians. Residents are supervised by both general internists and subspecialty physicians in the clinic. There are 45 subspecialty physicians in our institution that assist with resident supervision in the continuity clinic. The clinic serves as the primary care provider for military retirees and their spouses. Patients are seen by internal medicine residents and staff as well as rotating medical students under staff supervision. All patient encounters by residents are reviewed with staff physicians practicing either general internal medicine or the various internal medicine subspecialties. Practice patterns of only staff general internists and residents in internal medicine were analyzed in this study.

Patient Identification and Recruitment

Subjects with clinically apparent type 2 diabetes were identified by chart review. All ambulatory general internal medicine clinic patients at WHMC with type 2 diabetes were eligible for inclusion. Clinic notes from routine appointments were assessed to determine if a diabetic foot exam was performed. Acute care/walk-in patients, patients seen and examined by medical students, patients with a documented proper diabetic exam or hospitalization within the previous 3 months, and patients of the investigators or staffed with the investigators were excluded from analysis.

Study Design

The study consisted of 3 parts: a retrospective chart review, an educational intervention, and a prospective analysis of physician behaviors following the intervention at 3 and 6 months. The retrospective phase consisted of chart review of 556 randomly selected diabetic patient visits from 1995 to 1998. For the purposes of this study, the documentation of a proper foot exam was defined as including the assessment of at least 2 of the 3 following elements in a lower-extremity examination: vascular/circulation exam, neurological status, and skin condition.^{2,22-24} The intervention phase was multifaceted. Two short presentations on the importance of foot examination as part of routine diabetic care were given at separate morning report sessions during the month of September 1998. In addition, a handout on the importance of diabetic foot exams was distributed to all residents at that time. It was also announced during a general internal medicine staff meeting that a "QA review" was to be performed on the adequacy of diabetic foot care at some unspecified time. Medicine clinic support staff were

instructed to have diabetic patients remove their shoes and socks when they were placed in an exam room. Notices were also placed on the back of clinic doors reminding diabetic patients to remove their shoes and socks for foot examination. The final phase of the study assessed impact on physician behavior by chart review focusing on documented foot examinations. Prospective chart review was conducted at 3 and 6 months to assess the early and late impact of the physician and support staff directed intervention. All chart review was performed by 3 of the 4 physician investigators listed in the author section. All charts of diabetic patients seen in the internal medicine clinic were reviewed each day during the 3- and 6-month phases of the study to determine physician compliance with and documentation of foot examination.

Statistical Analysis

One-way analysis of variance and/or χ^2 tests were used to compare the demographic makeup of all 3 groups for which data were collected (pre, 3 months, 6 months). Pearson's χ^2 analysis was then employed to determine the impact of the educational intervention on the performance of diabetic foot examination at 3 and 6 months. Ninety-five percent confidence intervals were calculated for baseline comparisons as well as at the 3- and 6-month intervention phases.

RESULTS

Patient Characteristics

The patient demographics are outlined in Table 2. Patient visits were reviewed at baseline ($N = 556$), then at 3 ($N = 162$) and 6 months ($N = 182$) post-intervention and were well matched with respect to age, gender, duration of diabetes, presence of diabetes-related micro- and macrovascular complications, prior history of foot ulcers, and modality of treatment. Significant differences were noted in diabetic control as reflected by hemoglobin A1c values, with a significantly higher proportion of patients having better control at 3 and 6 months. There was also a significant difference in type of visit (new versus follow-up) and staff appointments, as shown in Table 2. The increased proportion of new patients and staff appointments in the prospective arm of the study is due to the implementation of a Medicare HMO demonstration project. This coincided with the 3-month follow-up portion of the study. However, by 6 months, the proportion of new patient and staff appointments had fallen back to baseline levels. This incorporation of a managed-care panel into our patient population may have also accounted for the improvements in glycemic control noted at 3- and 6-month follow-up. It is important to note that chart documentation requirements did not change with the implementation of the HMO demonstration project.

At baseline, the documentation of a proper diabetic foot exam at our institution was poor (14.0%). Similarly,

the performance of any portion of a proper foot exam was seen in only 32.6% of patient visits. These figures are consistent with other published reports. In subgroup analysis, the variables of patient age, gender, modality of therapy, most recent hemoglobin A1c, and type of reviewing staff had no significant impact on the performance of proper foot exams. The effect of level of training and the likelihood of performance of a diabetic foot exam was also assessed (Table 3). As compared to PG-2/3 residents, PG-1 residents and staff were more likely to perform a proper foot exam (6.8% vs 22.8% and 18.5%, respectively; $P < .0001$ by Fisher's exact test). Interestingly, the presence of risk factors associated with the development of foot ulcers, namely microangiopathic disease of the eyes, kidneys, and nerves, had no effect on the likelihood of the performance of a proper foot exam during an individual patient visit (see Table 4). An even more surprising finding at baseline is that during patient visits in diabetics with a history of PVD or previous foot ulcer, when taken as a combined variable, there was no greater incidence of documented proper foot exams than during patient visits in diabetics without these high-risk conditions (14.0% vs 14.3%; $P = .95$ by χ^2 analysis). At baseline, new-patient appointments had a statistically higher incidence of proper exams than did follow-up patient appointments (21.0% vs 12.0%; $P = .018$ by Fisher's exact test), but this highlights the fact that 79% of new-patient appointments did not include a proper diabetic foot exam.

Effect of Intervention

Figure 1 demonstrates the statistically significant and persistent increase in the percentage of physicians documenting proper foot examinations at 3 and 6 months as compared to baseline. The attributable improvement for performance of a proper exam at the 3-month interval was 44% (95% confidence interval [95% CI], 35.9% to 52.1%) and 48.1% (95% CI, 40.0% to 55.7%) at the 6-month interval. Additionally, the performance of any 1 of the 3 components of a proper exam increased dramatically over the course of the study from 32.6% at baseline to 67.3% ($P < .001$) at 3 months and 72.5% ($P < .001$) at 6 months, an attributable improvement of 34.7% (95% CI, 26.5% to 42.9%) and 39.9% (95% CI, 32.4% to 47.5%), respectively. Moreover, the performance of each component of the exam increased substantially over the course of the study (see Figure 2). Age, gender, type of visit, presence and number of microangiopathic complications, history of PVD or foot ulcers did not affect the probability of the documentation of a proper exam at 3- and 6-month follow-up. It appears that the educational campaign improved the performance of a proper foot exam regardless of patient characteristics or appointment type. However, level of training was again found to have an impact on the likelihood of foot examination during the late follow-up phase of the study (see Table 5). At the 3-month interval, all

Table 1. Prior Studies on Diabetic Foot Examination

Foot Examination	%	N	Method of Documentation	Setting
In past year				
Comprehensive foot examination	52	6,959	CR	Indian Health Service ^{22*}
	<10	350	CR	Academic, inner-city clinic ²⁴
Unspecified foot examination	68	352	CR & PI	Academic, inner-city clinic ^{27*}
	<6	NR	NR	UCLA study ²³
	55	544	CR	8 Community clinics ²⁸
	41	237	CR	Control community clinics ²⁵
	94	399	CR	Intervention community clinics ^{25*}
	67	590	CR	7 Diabetes miniclinics, UK ^{26†}
	49	65	SR & PI	Diabetes clinic, U.S. ^{33†}
Periodic foot examination	81	5,640	SR	Postprogram, Clinical Education Program ²¹
Every 4–6 mo	53	1,502	SR	National Survey, NIDDK ²⁰
Foot doctor in past 2 y	78	393	PI	8 Communities in Michigan ²⁹

* *Interventional study.*

† *Diabetes clinic(s) (all others primary care clinics).*

CR, chart review; PI, patient interview; SR, self-reporting by physicians; NR, not reported; NIDDK, National Institute of Diabetes and Digestive and Kidney Diseases.

groups were equally likely to perform a proper of foot exam. However, at the 6-month follow-up point, PG-1 residents and staff were more likely to document a proper foot exam as compared to PG 2/3 residents (71.8% and 74.5% vs 52.1%; $P = .0138$ by Fisher's exact test).

DISCUSSION

Patients, physicians, and health care systems can be influential factors in the implementation of preventive care recommendations.^{30–32} Given that previous chart-based

interventional studies^{22,25,27} were directed at patients and healthcare systems, we directed our educational program predominantly at physicians serving as primary care providers in our general internal medicine clinic. Previous studies^{26,33} suggest that the rate of foot examination is considerably higher among patients who are seen in diabetes clinics as compared to primary care clinics. It is important to note that primary care providers render >75% of all care for patients with diabetes.^{22,23} Therefore, we felt that an educational campaign directed at primary care providers would have the most impact.

Table 2. Patient and Physician Characteristics*

Patient Visit Characteristics	Pre-intervention, % (n)	3 Months Post-intervention, % (n)	6 Months Post-intervention, % (n)	P Value†
Age >50	95.0 (528)	98.1 (159)	95.6 (174)	.22
Male	54.1 (301)	54.3 (88)	58.2 (106)	.61
Duration ≥5 y	70.3 (391)	79.0 (128)	74.7 (136)	.07
Neuropathy	23.9 (133)	24.1 (39)	27.5 (50)	.60
Retinopathy	27.7 (154)	29.0 (47)	30.8 (56)	.69
Nephropathy	30.4 (169)	34.6 (56)	39.6 (72)	.06
PVD	10.3 (57)	7.4 (12)	9.9 (18)	.55
Ulcer Hx	2.3 (13)	3.1 (5)	3.8 (7)	.53
A1c <8	59.9 (333)	69.8 (113)	72.0 (131)	.003
Treatment				.111
Diet	12.2 (68)	14.2 (23)	14.8 (27)	
Insulin	43.9 (244)	37.0 (60)	35.7 (65)	
Oral agents only	43.9 (244)	48.8 (79)	49.5 (90)	
Type of visit				.001
New	22.3 (124)	34.0 (55)	17.0 (31)	
Follow-up	77.7 (432)	66.0 (107)	83.0 (151)	
Level of training				.016
PG-1	26.1 (145)	26.5 (43)	21.4 (39)	
PG-2/3	47.7 (265)	36.4 (59)	52.8 (96)	
Staff	26.3 (146)	37.0 (60)	25.8 (47)	

* All percentages rounded to the nearest decimal point.

† χ^2 result from comparison of groups.

PVD, peripheral vascular disease.

Table 3. Level of Training and Performance of a Proper Diabetic Foot Exam at Baseline With Exact 95% Confidence Intervals*

Level of Training	Total Number of Patient Visits, <i>n</i>	Patient Visits with Any Foot Exam		Patient Visits with Proper Foot Exam		<i>P</i> Value†
		<i>n</i> (%)	95% CI	<i>n</i> (%)	95% CI	
PG-1	145	76 (52.4)	52.0 to 52.8	33 (22.8)	22.4 to 23.2	<.0001
PG-2/3	265	54 (20.4)	20.2 to 20.7	18 (6.8)	6.6 to 7.1	Reference
Staff	146	51 (34.9)	34.6 to 35.4	27 (18.5)	18.2 to 19.0	<.0001
Total	556	181 (32.6)	32.4 to 32.7	78 (14.0)	13.9 to 14.2	

* All percentages rounded to the nearest decimal point.

† By Fisher's exact test from comparison of groups.

As with prior studies, the analysis of practice patterns at the onset of our study shows relatively poor performance on the part of physicians in providing adequate diabetic foot exams, with only 14% of physicians documenting proper exams. There was a significant increase in documented proper foot exams at 3 and 6 months after a multifaceted intervention, which exceeded the impact shown in prior studies. Unlike previous studies, the intervention made in the current trial focused primarily on physician education through formal teaching sessions with an ancillary focus on support staff, which may account for the more dramatic impact on physician behavior. Significant improvements were made in all 3 components of the diabetic foot exam, and the percentage of physicians in compliance remained persistently elevated even at the 6-month end point. Finally, the improvements in documented diabetic foot exams were brought about with minimal time investment and cost. Less than \$10 was needed to prepare information handouts for physicians and support staff and to create reminder signs for diabetic patients that were placed in each exam room.

The dramatic response rate to the educational campaign occurred for several reasons. We emphasized the remarkable incidence, prevalence, morbidity and even mortality, along with the economic impact of diabetes-related foot disease as a means to encourage performance of foot exams by primary care physicians. Another factor that contributed to our dramatic response was involving the support staff in the educational campaign. Instructing

support staff to have diabetic patients remove their shoes and socks along with the reminder signs for patients in the exam rooms almost certainly had a considerable effect. On the basis of a study by Cohen,³⁰ diabetics who present with bare feet in the exam room are 3 to 4 times more likely to have their feet examined as those wearing shoes and socks. We realize that even with our intervention, 38% of diabetics did not have foot examinations at routine appointments. However, based on current ADA recommendations, only those patients with peripheral neuropathy or other high-risk conditions require more frequent examinations than simply on an annual basis. Stamps in the progress notes providing space for documentation of the diabetic foot exam, flagging charts, additional educational seminars for physicians, patients, and support staff, and providing a Semmes-Weinstein monofilament or a 128-Hz tuning fork in each exam room would be additional methods of further improving compliance.

Only 2 previous studies have addressed the components of a proper foot examination, and physician compliance rates in these studies ranged from <10% to 52%.^{22,24} In 1986, the Indian Health Service (IHS)²² established diabetes care standards and an assessment process to evaluate adherence to those standards using medical record review. We chose a similar process to document adherence to proper foot examination in our study. It is encouraging to see that physician performance of foot examination actually increased over time in our study. This has the potential to be a durable response given

Table 4. Risk Factors for Foot Ulceration and the Likelihood of Foot Examination at Baseline*

Risk Factor for Foot Ulceration	Total Number of Patient Visits	Patient Visits With Proper Foot Exam, <i>n</i>	Percentage With Proper Foot Exam	<i>P</i> Value
Microangiopathy—none	289	35	12.1	
1 Organ system affected	121	21	17.4	
2 Organ systems affected	93	13	14.0	.55†
3 Organ systems affected	53	9	17.0	
No known peripheral vascular disease or history of a foot ulcer	493	69	14.0	.95†
Known peripheral vascular disease or history of a foot ulcer	63	9	14.3	

* All percentages rounded to the nearest decimal point.

† χ^2 result from comparison of groups.

FIGURE 1. Improvement in performance of a proper foot exam over the course of the study (Baseline, 3 and 6 months post intervention). All percentages rounded to the nearest decimal point; $P < .001$ for comparison to baseline foot exam by χ^2 analysis.

the 52% compliance rate in the IHS model 6 years after the implementation of their program.²² Furthermore, Wylie-Rosett et al.²⁴ have demonstrated that having a foot examination in the preceding year doubles the chance of having a foot examination in the following year. Both of these studies support the cautious optimism we have for continued physician compliance with diabetic foot examination at our institution. Finally, we felt that discussing the components of a proper exam with physicians would further emphasize the risk factors and pathophysiology for foot complications in diabetes, which would then translate into increased examination, improved patient education, and potentially increased referrals to foot specialists.

Previous intervention studies by Deeb et al.²⁵ and Litzelman et al.²⁷ indicate that a systematic approach to patient care improves rates of foot examination. Our study took this systematic approach one step further by directly involving physicians. It is difficult to assess which component of the intervention had the most significant impact

Table 5. Level of Training and the Performance of Proper Foot Examination at Baseline and After the Educational Intervention*

Level of Training	Baseline, %	3 Months, %	6 Months, %
PG-1	22.8	60.5	71.8
PG-2/3	6.8	59.3	52.1
	($P < .0001$) [†]	($P = .844$) [†]	($P = .0138$) [†]
Staff	18.5	55.0	74.5

* All percentages rounded to the nearest decimal point.

[†] Fisher's exact test result from comparison of groups.

on physician behavior. Additionally, given the limited follow-up time and design of our study, we were unable to ascertain if this behavioral change led to improvements in long-term patient outcomes. However, several uncontrolled studies have found that the implementation of improved foot care programs can significantly reduce lower-extremity complications in patients with diabetes, demonstrating a 44% to 85% reduction in the rate of lower-extremity amputation.^{19,34-36} Involving physicians in the interventional process will improve patient education in the long term. As Reiber et al.³⁷ have shown, patients with diabetes who had not received outpatient education were more than 3 times likely to have a lower-limb amputation. We did not follow referral patterns to podiatry, orthopedics, or vascular surgery, but based on 2 previous studies by Wylie-Rosett et al.²⁴ and Bailey et al.,³³ it appears that foot examinations by primary care providers and subsequent referrals are closely related.

Some potential limitations of our study deserve consideration. We believe that our results can be reproduced in nonmilitary, nonhospital-based patient care settings. As demonstrated by Jackson et al.,^{38,39} patient characteristics, diagnoses, and procedures, in military and civilian internal medicine are more similar

FIGURE 2. The improvement in all 3 components of diabetic foot examination over the course of the study (Baseline, 3 and 6 months post intervention). All percentages rounded to the nearest whole number; $P < .001$ for comparison to baseline for each component of the foot exam by χ^2 analysis.

than they are different, whether the context of care occurs in the inpatient or the outpatient setting. Similarly, previous studies^{22,25,27} have found that physician performance and documentation of proper foot examination can be improved with an educational intervention regardless of patient, physician, or clinic characteristics. Performance and documentation of proper foot examination are not necessarily concordant. It is likely that foot examination was performed in the pre-intervention and post-intervention phases and not documented. However, the fact that only 21% of new-patient appointments had a documented foot exam and that follow-up appointments had an even lower documentation rate suggests that performance and documentation may be closely related.

The effect on level of training and the likelihood of performance/documentation of a diabetic foot examination during a patient visit is another interesting finding in our study. At baseline, PG-1 residents and staff were more likely to perform foot exams than were PG-2/3 residents. At the 3-month interval, all groups performed foot examination to a similar degree; however, at the 6-month follow-up period, PG-1 residents and staff were more likely to perform foot examination than were PG-2/3 residents. On the basis of these data, it appears that residents may actually be less likely to perform a diabetic foot examination as they advance through residency training. Similarly, we do not feel that the marked improvement in performance of foot examination was related to improved practice patterns as residents gained experience in the outpatient setting, since this was not apparent during our baseline retrospective review or at the 6-month follow-up period. It appears that the improvement in performance/documentation of diabetic foot exams was due solely to the educational intervention. Future studies should focus on techniques to ensure that a high level of foot examination is maintained throughout residency training.

This study confirms the relatively poor compliance of primary care physicians in performing adequate diabetic foot screening. Our results add evidence to support the role of continued interventional campaigns to improve the likelihood of a proper diabetic foot examination. In particular, a predominantly physician-directed intervention appears to be an important component in improving comprehensive diabetic care. In conclusion, further investigation is needed to determine the impact of such an intervention on the long-term morbidity and mortality of diabetic foot disease.

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