Implementation of a Diabetic Visual Foot Assessment in a Primary Care Setting

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Citation

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Abstract

Purpose: The purpose of this project was to implement a visual foot assessment by health care providers at every visit for patients with diabetes. The objective was to identify common foot conditions that may predispose patients to further complications that might lead to amputation. Methods: The Plan-Do-Check-Act (PDCA) cycle was implemented in an internal medicine clinic. The records of fifty-two patients with a diagnosis of type 2 diabetes that were seen in the clinic during a two week period were reviewed to determine the percentage of foot assessments completed and the type of foot conditions identified. Results: At the office encounter, 86.5% of patients received a visual foot assessment during the two week period. Twenty-three of the fifty-two patients had at least one foot condition or complication identified. Conditions identified were acute swelling, skin breakdown, callus, digital deformity, amputation, dystrophic nails, and dry skin. Conclusion: The recommendation is that health care providers follow standards of care by performing a visual foot inspection at every encounter. The implication for practice is that foot conditions can be identified early, thus allowing for proper implementation of interventions in an effort to decrease amputations.

INTRODUCTION

According to the Center for Disease Control (CDC), diabetes and its associated complications cost the United States (US) $174 billion in direct and indirect costs in 2007 [1]. An estimated 24 million people in the US have diabetes, and the number is expected to double by the year 2030. A person with diabetes spends $11,744 annually on health care costs compared to $5,095 for a person without diabetes [1]. According to the Amputee Coalition of America [2], diabetes-related amputations cost approximately $3 billion per year or $ 38,077 per amputation procedure. Lower extremity amputations (LEAs) and ulcerations are major causes of morbidity [3], and a potent predictor of all-cause and cardiovascular mortality in patients with diabetes [4]. Although the monetary cost is evident, the cost to patient quality of life is a compelling reason to address the complications that arise from not identifying risk factors or early signs of tissue damage, especially tissue damage of the feet.

According to the CDC [1], in 5 years a comprehensive foot care program can save $1200 in health care costs for a person with previous foot ulceration or amputation. Sixty-seven percent of amputations in the United States are related to diabetes; and in 2003, 75,000 LEA hospital discharges were documented [2]. The lower extremity amputation rate is 10 to 15 times higher in people with diabetes, in males, and increases with age [5]. Health care costs associated with diabetes have steadily increased and have placed an economic burden on society. As a result of rising health care costs, the concept of pay for performance has gained momentum.

Pay for performance functions under the premise that health care providers deliver the right care to the right patient under the right circumstances in order to meet national benchmarks for outcomes [6]. Medicare has been instrumental in advocating for pay for performance as a means of controlling rising health care costs. If health care providers are to be reimbursed according to patient outcomes, implementation of a visual foot assessment protocol represents a business case for change. Reduced amputation rates have been recommended as indicators of quality of care [7], and are likely to be used as the indicator in pay for performance. Patients might prefer to seek health care providers who have lower rates of LEA or complication rates [8], and these providers could receive financial incentives or rewards.

Lack of comprehensive foot examinations has been identified as a risk factor for LEA [8]. Foot care programs that include routine foot assessments and patient education can prevent up to 85 % of diabetes-related amputations [1]. The American Diabetes Association (ADA) Standards of Medical Care in Diabetes include recommendations for annual comprehensive foot examinations including monofilament testing. A visual foot inspection at every visit is also part of the current practice recommendations [9]. According to the Texas Diabetes Council [10], Texas has a 68.4 % age adjusted rate for annual foot examinations as compared to the national target of 91 %. Statistical information regarding the percentage of visual foot exams is not available. The risk of developing a foot ulcer or requiring a second amputation increases after an initial amputation, and 50 % of patients with diabetes die within 5 years after undergoing an amputation [11].

METHODS

SETTING AND IMPLEMENTATION

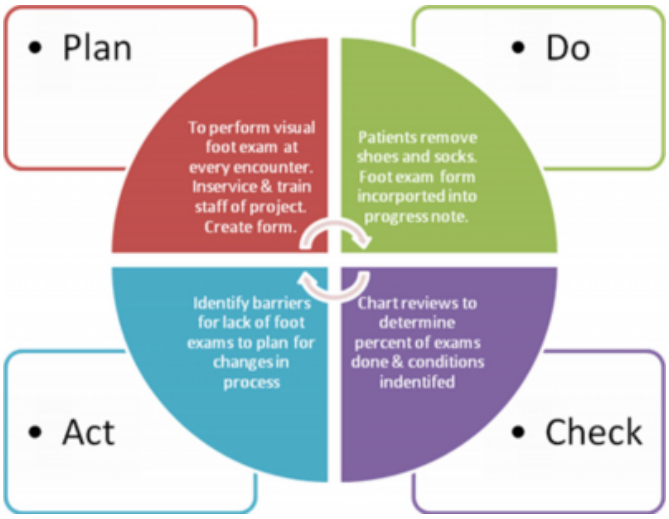
The practice site is an internal medicine clinic located in South Texas. Prior to implementation of this project, patients seen in the clinic did not have a visual foot inspection at every visit. Patients only had a visual foot assessment performed if the patient or caregiver brought up a concern during routine office visits. An initial analysis into reasons foot exams were not being performed at every visit was conducted. The medical staff, physician, and nurse practitioners were unaware that a visual foot assessment at every visit was considered current standard of care. The medical assistants stated that having patients remove shoes and socks was time-consuming and that patients voiced reluctance to remove their shoes and socks due to foot hygiene concerns.

PLAN-DO-CHECK-ACT CYCLE

The change was implemented using the Plan-Do-Check-Act (PDCA) cycle as described by W. Edwards Deming [12]. The PDCA cycle is described as a continuous cycle for learning and improvement. The premise of this cycle is that a plan is implemented, tested, and action is taken based on the outcomes. The PDCA cycle is continuous because interventions that are not yielding desired results give rise to the opportunity to begin the cycle once again. The two nurse practitioners, the physician, and medical assistance were in-serviced regarding the purpose and use of the PDCA cycle (Figure 1). Based on staff recommendations discussed during meetings, the author developed a modified foot assessment form that was placed on the back of the existing progress note (Figure 2).

Figure 1

FIGURE 1. PDCA Cycle for Foot Assessments



The “Plan”, which was developed by the author, was to perform visual foot assessments at every visit for patients with diabetes who met the criteria. The inclusion criterion required a diagnosis of type 2 diabetes. Patients with diabetes with diagnoses of neuropathy, peripheral vascular disease, and foot conditions in the medical record were also included. Patients with bilateral below or above the knee amputation were excluded. The plan did not include a monofilament test because this exam would add additional visit time at each appointment. The current ADA recommendations for foot care includes an annual comprehensive exam, foot inspection, and monofilament testing [9]. A compromise was reached with the health care providers to implement a program that would add no more than 1-2 minutes to each visit. The health care providers see approximately 35 patients per day and adding 35-70 minutes to the workday was acceptable. The rationale for identification of foot conditions is that a high percentage of amputations are preceded by a non-healing ulcer in a patient with neuropathy or peripheral vascular disease [13]. The plan included creating the form and training the clinic staff on the project and how the form was to be used.

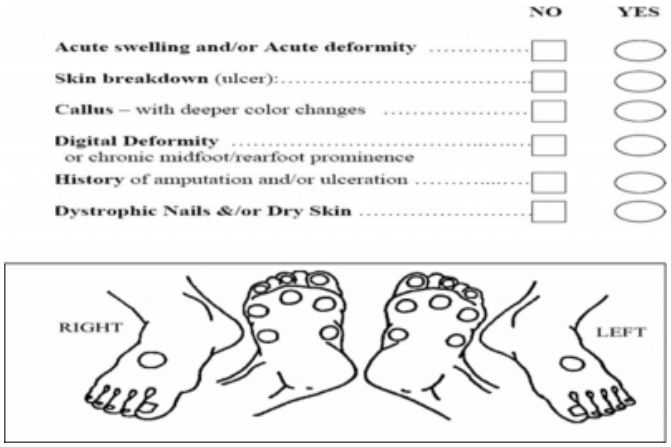
In the “Do” phase, the medical assistant folded the progress note so that the health care provider would see the tool upon opening the chart. The form was to be completed by marking whether or not the condition was present. The circles on the foot diagram are where the health care provider would document the monofilament testing if and when this assessment was performed. However, the monofilament test

was not a requirement for this project in order to minimize the time that was added to the encounter with the health care provider. Next, fliers were placed in the area where vital signs are collected to remind the medical assistants to have patients remove shoes and socks once in the exam room. Bilingual fliers were also placed on the inside of the exam room doors to remind patients to remove shoes and socks.

The "Check" phase of the cycle included weekly meetings to review charts of patients who were seen the previous week. An Excel spreadsheet was developed to track the number of patients with diabetes who had a visual foot assessment performed by the health care provider. The "Act" phase included identification of barriers to visual foot assessments in those patients who did not receive a foot screening.

Figure 2

FIGURE 2. Foot Assessment Form



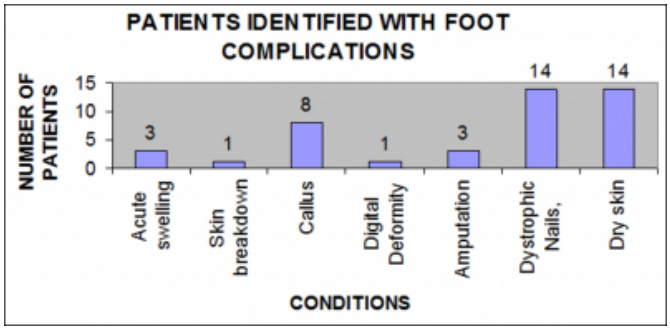
RESULTS

Fifty-two patients with diabetes were seen during the two week period in which the visual foot assessment pilot project was implemented. Twenty-nine patients were female (55.8%) and 23 patients were male (44.2%). The age range was 39 to 95 with a mean age of 67 years. Figure 3 shows the number of conditions identified. Ten patients had two or more conditions identified. Seven patients did not have a visual foot assessment performed, yielding an 86.5 % completion rate. The physician did not perform four foot assessments and the nurse practitioners did not perform three assessments each. Reasons identified by the health care providers for not performing foot assessments were forgetting to perform the assessment or not having ample time to perform during the visit. The health care providers stated that assigning a "diabetes foot assessment" day might be a solution to ensure compliance with the recommendations for foot care. The cost of implementing the change was negligible, but the cost of not implementing the change could be detrimental. Benefits of implementing the change were evident in identification of complications and risk factors predisposing patients to negative outcomes.

The cost incurred for implementing of the change was not significant. New forms or tools were not purchased. The existing progress note was modified by copying the foot assessment on the back. Three of the top ten diagnoses for which Medicare spends the largest amount of money are related to diabetes [6]. Diabetic wounds represent 80 % of all chronic wound costs with an estimated cost of $8.5 billion [6].

Figure 3

FIGURE 3. Foot Conditions Identified



DISCUSSION

The initial goal was to have a 100 % compliance rate for visual foot assessment. The goal was not met, but the desired outcome of performing a visual foot assessment to identify conditions and avoid complications was achieved in 45 out of 52 patients. A visual foot assessment is a simple intervention that is quick and easy to perform. However, foot assessments are routinely not done at every encounter in this primary care setting as evidenced by an 86.5 % compliance rate. The practice saw an increase in identification of foot complications that might have otherwise been missed. Revenue for the practice also increased through identification of risk factors for complications and subsequent diagnostic evaluation for peripheral neuropathy through neurometer testing and peripheral vascular disease through ankle-brachial index (ABI) testing. Neurometers and ABIs are considered in-house testing in this practice. During the two week period four neurometer tests and one ABI were done. Routinely, one neurometer test is averaged monthly and one ABI test is averaged every four months.

CONCLUSION AND RECOMMENDATIONS

This quality improvement pilot project had several limitations. The sample size was small, monofilament testing

was not performed, and data were collected for only two weeks. The convenience sample limits the generalizability of the findings. Additionally, only those patients with an appointment during the two week period were included in the quality improvement project. The project outcome, which was to identify common foot conditions in patients with diabetes, was met. The PDCA cycle continues to be used in this medical clinic. The flyers remain in the exam rooms to remind patients to remove shoes and socks during visits. However, the providers decided to document findings on the progress note rather than using the foot diagram.

Amputations in patients with diabetes are a common complication. Health care providers are in a unique position to intervene by performing visual foot assessments at every encounter to identify complications early and prevent further deterioration. A visual foot assessment is one aspect of a comprehensive approach to diabetes management. The incidence and prevalence of diabetes and the complications associated with diabetes are increasing. Health care providers have a responsibility to implement evidence-based practice recommendations and are in a unique position to perform a visual foot assessment at every patient encounter.

Recommendations for change in the future include scheduling an appointment for yearly comprehensive foot examinations. The plan for this practice is to schedule patients for additional appointment time to allow the health care provider to perform a comprehensive foot exam. The next part of the change process is to inquire about billing codes that health care providers can use to bill for the annual foot exam. Implementation of these changes provides for an increased quality of care for patient with diabetes.

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