Increasing Documentation and Performance of Diabetic Foot Exams at HOPES Clinic Through Implementation of EHR Templates

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Abstract

Introduction: One of the top five diagnoses at the Health Outreach Partnership of Eastern Virginia Medical School (HOPES) clinic in Norfolk, Virginia is diabetes. The clinic's goal is to increase the number of diabetic foot exams performed and documented during diabetic patient visits in an effort to prevent the complications of foot ulcers and amputations. A template, which included the components of the diabetic foot exam, history, and follow up guidelines, was made available in the clinic's electronic health records (EHR) for student clinician teams to utilize with diabetic patients. In addition, training videos were developed to instruct student clinicians on using the EHR and accessing the templates. The purpose of this study is to determine if there was an improvement in documentation of diabetic foot exams after the institution of EHR templates and instructional videos.

Methods: A chart review was performed on all diabetic encounters between August 24th, 2016 and November 10th, 2016. This time period included all diabetic encounters after the implementation of both the EHR template and the EHR instructional videos. A total of 15 diabetic patient encounters were reviewed.

Results: At least one component of the diabetic foot exam was performed in 13 out of 15 encounters. 11 out of 15 encounters recorded at least a visual inspection of the foot for lesions and ulcers. 4 out of 15 encounters had 3 components of the foot exam.

Conclusion: A previous retrospective chart review at HOPES showed that only 27% of diabetic encounters included at least one component of the foot exam.i After the implementation of a template and instructional videos, 87% of diabetic encounters included some component of the foot exam. Utilization of templates and instructional videos has improved the documentation of patient care and, more importantly, the quality of care. While there has been progress in the documentation of these exams, further improvement is possible with more complete foot exams. Future changes include tasking the check-in staff with pre-populating a diabetic patient's chart with the template for a diabetes follow up encounter and including more components of the foot exam in the EHR template. coordinators to our findings to help facilitate EHR utilization with verbal reminders during clinic.

Background

One of the top five diagnoses at the Health Outreach Partnership of Eastern Virginia Medical School (HOPES) clinic in Norfolk, Virginia is diabetes. Currently, 8.8% of HOPES patients have diabetes. This is slightly lower than the prevalence of diabetes in Norfolk, Virginia, which is 9.4% and higher than the national prevalence of 8.1%.[1] In 2010, the age-adjusted death rate due to diabetes in Norfolk was 22.9 per 100,000 people and the rate of hospitalization due to diabetes was 240.9 per 100,000 people. Of the

complications that caused hospitalizations, neurologic sequelae and amputations constituted 87% of cases. The total cost of hospitalization due to neurologic complications of diabetes in Virginia added up to $41,969,672 and the total charges for amputation added up to $64,426,937.[2]

Diabetic also have a 25% lifetime risk of suffering from a foot ulcer, making this a common complication in these patients, which can be prevented through screening and risk assessment.[3] According to the American Diabetes Association (ADA), annual foot exams consisting of relevant history, general inspection, dermatological, musculoskeletal, neurological and vascular assessments should be performed on all patients with diabetes to identify risk factors predictive of ulcers and amputations. Prevention and close monitoring can reduce amputation rates by 49 to 85%.[4] HOPES Clinic is a safety net clinic, and one of its aims is to prevent emergency room visits and hospitalizations due to the complications of diabetes. As such, the clinic's goal is to increase the number of diabetic foot exams performed and documented during diabetic patient encounters in an effort to prevent these known complications of foot ulcers/amputations and their associated burden on the healthcare system.

Electronic health records (EHR) templates have been implemented in many practices to increase documentation of patient information. After implementing a template to document obesity, a primary care clinic found improved documentation of obesity and improved rates of nutritional and physical activity counseling.[5] With the goal of increasing the number of diabetic foot exams performed in clinic, a template including all aspects of the diabetic foot exam, history and follow up guidelines was made available in the clinic's EHR for student clinician teams to utilize with diabetic patients. The template includes important questions that student clinicians often do not ask due to time constraints. Next to the questions, there are guidelines to remind students of best practices and qualifiers to help obtain accurate histories. One study that evaluated physician attitudes and clinical efficiency of embedded guidelines within an EHR showed that charting time was decreased and that physicians delivered higher quality of care.[6] The goal of including guidelines and qualifiers in the template was to decrease the amount of time student clinicians spent looking up information and to ensure that students provided the highest possible standard of care.

In addition to templates, training videos were developed to instruct student clinicians on how to use the EHR and how to access the templates. The purpose of the EHR videos was to eliminate the barriers of in person time constraints so that all clinicians received information about templates before their clinic shift.

The purpose of this study was to determine if there was an improvement in documentation of diabetic foot exams after the institution of EHR templates for diabetic patient encounters and instructional videos that show students how to access these templates.

Methods

A retrospective chart review was performed on all diabetic encounters between August 24th, 2016 and November 10th, 2016. The encounters during this time period were directly after the implementation of both the diabetes EHR template and the instructional EHR videos. 15 diabetic encounters were checked for completeness of the foot exam as well as documentation of multiple components of the exam, including visual inspection, monofilament testing, vibration testing, pinprick testing and ankle reflexes. The template included questions such as:

- How frequently do you monitor your blood glucose?
- What is your fasting blood glucose?
- What is your random blood glucose?

- When was your last diabetic foot exam?
  - When was your last eye exam?
  - Do you have a family history of diabetes?
  - What is your diet like?
  - How much and what exercise do you do?
  - How much do you or have you smoked?
  - How much alcohol do you and have you consumed?

The physical exam portion of the template included general description, head, respiratory, cardiovascular, abdominal, neurological and musculoskeletal findings. Finally, a thorough foot exam was included in the physical exam as follows:

- Skin status: (color, thickness, dryness, cracking)
- Signs of infection/ulceration/calluses/ blistering
- Deformities
- Monofilament test
- Vibration sense
- Pinprick sensation
- Ankle reflexes
- BIL dorsalis pedis pulse
- Normal wear on shoes, fit properly

Three training videos were developed using the screen capture software Camtasia (Version 2.10.6, TechSmith, Okemos, Michigan, USA) and were uploaded to YouTube (Google Inc., Mountain View, CA, USA). The links to the YouTube videos were e-mailed to students the weekend prior to their Wednesday or Thursday shift in clinic. The videos review various aspects of the EHR and explain how to access templates (including the diabetes template) and how to populate the patient note with the template.

Results

A total of 15 diabetic patient encounters were reviewed. Table 1 lists a breakdown of patients by

Number of Foot Exam Components Completed	Diabetic Patient Encounters *(n =15)*	Percentage Of Total Encounters Reviewed
None	2	13.3%
1	3	20.0%
2	6	40.0%
3+	4	26.7%

Table 1: Breakdown of Patient Encounters Based on Number of Foot Exam Components Completed

Foot Exam Component	Number Completed *(n =15)*	Completion Rate
Visual Inspection	13	86.7%
Monofilament Testing	9	60.0%
Vibratory Sensation Testing	6	40.0%
Pinprick Sensation	4	26.7%
Ankle Reflexes	1	6.7%

Table 2: Summary of Completion Rates by Foot Exam Component

the number of foot exam components completed. At least one component of the diabetic foot exam was performed in 13 out of 15 encounters. Four out 15 encounters had three components of the foot exam recorded. Six out of 15 encounters had two components of the exam recorded. Three encounters had one component of the foot exam recorded. Two encounters did not have a foot exam recorded.

Table 2 shows a summary of completion rates by each foot exam component. 13 out of 15 encounters recorded at least a visual inspection of the foot for lesions and ulcers. Monofilament testing was recorded in 9 out of 15 encounters. Vibratory sensation testing was recorded in six out 15 encounters. Pinprick sensation was tested in four out of 15 encounters. Ankle reflexes were tested in one out 15 encounters.

Conclusions

A previous retrospective chart review at HOPES (prior to the implementation of the diabetic template and instructional videos) showed that only 27% of 274 diabetic encounters included at least one component of the foot exam.i Between August 24th and November 10th, 87% of diabetic encounters included at least one component of the diabetic foot exam. However, opportunities for improvement still exist. While visual examination of the foot has been fairly consistent, other exams such as ankle reflexes were only documented in 7% of encounters. Vibratory sensation and pinprick sensation were each documented in less than 50% of encounters. Checking vibratory sensation with a tuning fork is especially important as loss of vibratory sensation is an early predictor of neuropathy.[2]

Utilization of templates and instructional videos have helped improve the documentation of diabetic foot exams. While there has been progress in the documentation of these exams, improvement in completeness of foot exams still remains. Future changes include tasking the check-in staff with pre-populating a diabetic patient's chart with the template. The template can also be expanded to include a more thorough foot exam that requires the assessment of proprioception testing of the toes. Finally, student clinicians should be encouraged to complete the entire diabetic foot exam as outlined in the template to improve quality of care by preventing the costly complications of peripheral neuropathy and amputations.

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