

Template Implementation to Increase the Rate of Foot Exam Documentation in a Federally Qualified Health Center

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Introduction

- ▶ Diabetes is a growing public health concern
 - 84.1 million (33.9%) adults over the age of 18 years in the U.S. estimated as having pre-diabetes
 - 30 million (9.4%) adults estimated as having diabetes, 7.2 million of whom are not aware of their diagnosis (CDC, 2017).
- ▶ Diabetic foot disease is a significant complication for persons with diabetes
 - 50% of all non-traumatic amputations occur due to diabetic foot complications (Bortoletto et al., 2014).
 - People with diabetes are much more likely than those in the general population to require an amputation

Introduction

Clinicians can disrupt the development and progression of diabetic foot disease using routine clinical foot exams

- ▶ The American Diabetes Association (ADA, 2019) recommends a comprehensive foot exam to identify risk factors for ulcer development and amputation at least annually.
 - Patients with evidence of sensory loss, prior ulceration, or amputation should have an inspection of their feet at every visit.
 - Identified abnormalities require a more in-depth exam

Problem Statement

- ▶ A thorough clinical foot exam is relatively quick and has no significant associated costs.
 - However, despite being effective, fast, and cost-effective, the clinical foot exam rate in persons with diabetes is often suboptimal (ADA, 2019).

Focus of the problem: preventing foot ulcerations that lead to amputations

- ▶ The foot exam was not being completed nor documented in the EMR with lower quality indicator metrics in the Penderlea clinic.
 - This was identified via needs assessment in preparation for a visit from JACHO and HRSA.
- ▶ Parameters of the problem:
 - Lack of performance and documentation of diabetic foot exams impact patients in the Penderlea clinic.

Purpose

- ▶ Purpose of this project:
 - implement an intervention to increase the performance and documentation of foot exams in patients with diabetes at the Penderlea clinic
 - evaluate the effectiveness of the intervention
- ▶ The intervention will target frequent provider-reported barriers to completion and foot exam documentation that were cited in literature (Allen, et al., 2016; Catania et al., 2018; Cooksey, 2020; Mullan et al., 2019; Schoen et al. 2016; Thiyagarajan, 2017; Williams et al., 2018; Wu, et al., 2015)
 - Time
 - Ease of documentation
 - Clinic flow
- ▶ Primary Aim: improve completion and documentation of diabetic foot exams of patients in this clinic to 100% by using a specific diabetic template for diabetic patient encounters.
 - The template that will be used was selected by CWH.

Objectives

- ▶ **Implement a template** for the documentation of the encounters for diabetes mellitus, including foot exams.
- ▶ **Educate office staff** about the value of foot exams at diabetes visits and workflow that may facilitate efficient completion of foot exams.
- ▶ **Revise workflow** to have clinical staff request that patients remove shoes at the beginning of each encounter for diabetes.
- ▶ **Conduct interdisciplinary huddles** at the beginning of each day to identify and plan for shoe removal for appropriate candidates.

Background

- ▶ **Setting:**
 - Commwell Health: interdisciplinary group of 15 Federally Qualified Health clinics spread over several rural counties in Eastern North Carolina
 - Serves as a patient-centered medical home, offering medical, dental, mental health, infectious disease, and residential mental health services
- ▶ **Project site: The Penderlea clinic of Cromwell Health**
 - Medical care team at this clinic: full-time Nurse Practitioner, a part-time office manager, full-time front office staff, a Licensed Practical Nurse, and a Medical Assistant.

Background

- ▶ Foot ulcerations in persons with diabetes typically occur due to a combination of peripheral neuropathy and vascular compromise.
 - Peripheral neuropathy contributes to persons with diabetes having a loss of protective sensation (LOPS), which enables areas of pressure to the feet to go undetected. (Chao and Spry, 2018).
 - The development of a foot ulcer happens along a continuum and not as a single incident. **A foot exam can change the trajectory!**
 - An exam anywhere along the continuum of ulcer development may assist in averting the progression of ulceration and amputation. (Noor, et al 2015).



Background

- ▶ **Patients with diabetes who have had a foot ulcer have a high recurrence rate**
 - There is a 40% risk of recurrence within the first year and a 65% risk of recurrence within five years (Peraj et al., 2019).
 - "Recurrence is so common that patients with closed ulcers are considered to be in remission, as opposed to being healed" (Peraj et al., 2019, p. 242).
 - The combination of delayed discovery and frequent recurrences may result in recurrent infections, which may ultimately become resistant to anti-infectives (Noor, et al 2015).
 - Ulceration progression to affect bone and recurrent, resistant infections are factors that may ultimately lead to amputation (Bortoletto, et al, 2014).

Concepts

▶ *Diabetic foot Ulcers*

- wounds that penetrate the full thickness through the dermis below the ankle level in persons with diabetes. When left untreated, lead to infection and ultimately amputation (ADA, 2019).

▶ *Foot care/diabetic foot exam*

- includes obtaining a foot complication history, foot inspection for acute problems and the annual comprehensive foot (ADA, 2019)

▶ *Workflow*

- entails tasks that are to be done in chronological order by persons in an organization to get the organization's work done (Cain & Haque, 2008)

Concepts

► *Quality measures*

- tools that help in determining the quality of the health care delivered to patients. Quality measures quantify outcomes and how patients perceive the care that they receive. (Center for Medicare and Medicaid Services, 2019)

► *Nurse provider collaboration*

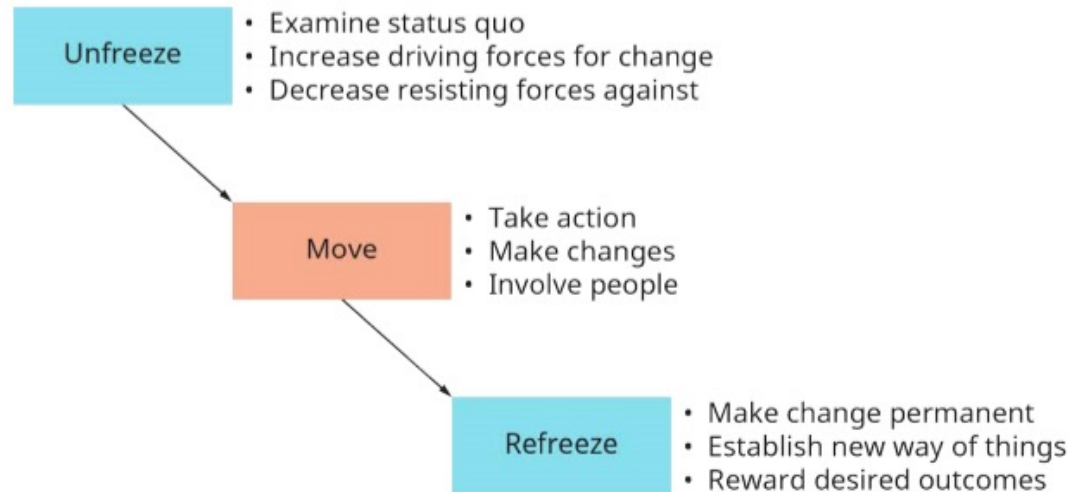
- a collaborative work relationship between the physician/provider and the nurse who works cooperatively, sharing responsibilities for solving patient problems, decision making, and carrying plans to improve patient care. Nurse patient collaboration can improve patient outcomes (Elsous, Radwan, & Mohsen, 2017)

Concepts

► Standardization of Documentation

- The use of different documentation modalities within the studies
- In the various studies individual authors used different terms to clarify what documentation modalities they used.
 - Many of the studies did not contain examples of these documentation modalities therefore, however, the overarching theme is that the team used the same format to meet the documentation need of the whole group in a standardized document.
 - It is likely that these terms could be used interchangeably in the body of evidence and it seems that using *standardization of documentation* to describe them would be sensible.

Framework: Kurt Lewin's change theory



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- ▶ Will help guide this project by encouraging employee input from the beginning to unfreeze the status quo successfully; requires buy-in
- ▶ Change is the 2nd step.
- ▶ The project proceeds forward with foot exams being performed and documented per ADA guidelines in the identified template.
 - We would expect to see improvements in number of documented diabetic foot exam and quality indicators.
- ▶ Refreeze step is important
 - Would ensure that new behaviors remain and that the change continues (Hussain, 2018)

Synthesis of the Evidence: Evidence Search

► *PICOT Question*

- Will implementing a designated diabetic foot exam template to be used in conjunction with each diabetic foot exam on each diabetic patient enhance quality indicators and meaningful use in a Rural Health Clinic within 4 weeks?

Population- Diabetic patients in a Rural Health Federally Qualified Health Center

Intervention- Implement diabetic foot exam template in conjunction with each diabetic foot exam

Comparison- standard of care or having no documentation for foot examination vs. use of template

Outcome- improved quality indicators due to adherence to the guideline as laid out by the American Diabetic association, including proper documentation at the correct interval

Synthesis of the Evidence

- ▶ A comprehensive literature review was conducted between January 2019 and January 2021
- ▶ Used various combinations of MeSH headings and terms including:
 - "diabetic foot exams"
 - "compliance"
 - "diabetes"
 - "diabetic foot ulcers"
 - "workflow"
 - "technology"
 - "foot exam documentation"
 - "technology in health care"
 - "quality indicators"
- ▶ Google Scholar was utilized as the initial search engine, followed by PubMed.
- ▶ The initial searches returned 1470 articles.
- ▶ Inclusion criteria:
 - articles focusing on diabetic foot exams
 - diabetic foot exam documentation
 - healthcare technology

Synthesis of the Evidence

- ▶ Review of title and abstract of the initial 1470 studies
 - 10 articles contained inclusion criteria of including English with full text available and exclusion of duplication.
 - Another search using diabetic foot exam compliance resulted in 2889 results; using the above criteria, the search was narrowed to 13 articles. Four more relevant articles were obtained via cross-referencing.
- ▶ **The final review included 27 articles**
- ▶ The level of the evidence is low, particularly since only 1 article was RCT, 1 PRISMA and the remaining were mostly of QI reports.

Synthesis of the Evidence

► Themes:

- There was consensus about missing foot exams and lack of documentation. The difference lay in how to correct the issue.
- Barriers for not completing and documenting foot exams
 - Time
 - Ease of documentation
 - Clinic flow
- Methods for overcoming foot exam and documentation apathy included use of electronic reminders and/or standardization of documentation
 - Flowsheets in the EMR and on paper to be scanned into the EMR
 - Templates
- Audits

Synthesis of the Evidence: Summary of Evidence

- ▶ Evidence contained mostly quality improvement articles
 - There are a few high-quality articles to support the performance and documentation of foot exams, however again, most of the articles are not of high quality.
- ▶ This provided a clear framework for the design of this project; however, quality improvement projects do not lend to strength when it comes to high quality evidence.
- ▶ Evidence is current
- ▶ Weakness
 - Each entity used a tool to unify the documentation of the organization represented
 - The reader is told what tool they used and what they called it
 - There was likely some overlap in the tools used

Methods

- ▶ **Project Design: Quality Improvement**
- ▶ **Participants: Patients with Diabetes Mellitus (DM) at Penderlea clinic**
 - Patients will be screened to identify those with a diagnosis of diabetes mellitus (DM) listed in their problem list
 - All patients with DM will be included in the project unless they have had a double amputation.
 - Penderlea staff

Methods: Plan for Implementation

The project will use the **Plan/Do/Study/Act framework** for support.

► In the **Plan** phase...

- The investigator engaged the stakeholders including formal leadership and board members.
- IT personnel identified a template in the EHR that could be used to document all foot exams and would allow the required documentation to be captured.
- The team agreed to use the newly identified template and the implement the changes outlined in the project.
- An action plan was developed, including a plan for data collection and analysis. The project leader submitted an IRB application and the project was launch.

Methods: Plan for Implementation (continued)

► In the Do Phase...

- The lead met with the IT personnel, who advised on how to access the template and how to best utilize the template to capture quality indicator requirements and reimbursement optimization.
- The team implemented the change, a small-scale quality improvement project, including documentation and recording, collection and analysis of the data.
- The plan for change included the use of a designated template in the EMR to document foot exams and other parts of the diabetic visit in an easily accessed template.

Methods: Plan for Implementation (continued)

- ▶ The plan was implemented with the following steps:
 - The nursing staff and provider met in the morning in a huddle to identify anticipated flow for the day and discuss project goals, team roles, and expectations.
 - The huddle also included a review of problem lists to identify patients with diabetes. Nursing staff and provider reviewed protocol for the nurse to have the monofilament and the tuning fork out for provider, as well as have the patient remove socks and shoes.
 - The schedule was monitored throughout the day by the project leader for add-ins who meet the criteria to have a foot exam.
 - The provider performed the foot exam on identified patients based on the patient history, e.g., patients with prior amputation require additional maneuvers including vibration testing using the tuning fork in addition to inspection, palpation, and monofilament testing.
 - The foot exam was documented in the designated template.

Methods: Plan for Implementation (continued)

► In the Study phase...

- The team reflected on what occurred and any changes for further improvement. Each member of the team was given the opportunity to reflect upon what went well and what needs improvement.
- The team considered what to keep and what to discard.
- Data was analyzed and compared to initial predictions/aims
- Data was summarized

► In the Act phase...

- The team reviewed the data and decided whether to repeat the same cycle, modify the current cycle based on observations/data, or develop a different cycle.

Data Collection

- ▶ The data collection plan was for IT to extract foot exam data early in the implementation period and at the conclusion of the project; however, the IT department experienced unexpected circumstances and were unable to participate in data collection.

Data Collection (continued)

- ▶ The project leader performed a retrospective chart audit for the implementation period. Inclusion criteria were persons who were billed for any CPT code for diabetes during the implementation period. Exclusion criteria were persons who had double amputations.
- ▶ Variables collected included:
 - Age
 - Race/ethnicity
 - Whether or not foot exam was documented in the template
 - Relevant foot exam findings such as ulcerations

Data Collection (continued)

- ▶ The project leader kept a journal of observations throughout the implementation period.
- ▶ Feedback was solicited from nursing staff through the Do/Study/Act phases.

Data Analysis

- ▶ Demographic characteristics of the participants were analyzed using descriptive statistics.
- ▶ The rate of foot exam completion/documentation during the implementation period was calculated by dividing the number of foot examinations documented in the EHR using the template by the total number of eligible visits.
 - This number was compared to the pre-implementation rate of foot exams-33%.

Data Analysis (continued)

- ▶ The number of abnormal foot exam findings was tallied.
- ▶ The project leader reviewed the journal and staff feedback for themes and ideas to inform future cycles.

Budget

- ▶ Implementation of the diabetic template was done at *no additional cost* to the organization.
 - The planning meeting was held during an already established huddle time.
 - The supplies for a comprehensive diabetic foot exam are already in the clinical setting.
 - There was not be an additional need for staff reinforcement.
 - However, for a project that would be conducted outside confines of work environment, the cost could be estimated as detailed in the following budget...

Budget

Item	Number	Cost
Nurse Practitioner	Average NP salary in NC is 62.00/hour x15 hours	930.00
Information Tech.	Average salary in NC is 68.00/hour x 3 hours	204.00
Monofilaments	25 per pack	64.00
New tuning forks x 3	Pack of 3	8.99

Results

- ▶ Project implementation occurred as planned from March 30 through April 30, 2021.
 - Morning huddles
 - Foot exams as indicated
 - Documentation in template

Results: Demographics

- ▶ 55 patients were eligible for a foot exam during the implementation period.
- ▶ Age: 33-94 years
- ▶ Race/ethnicity:
 - *30 AA (54.5%)
 - 23 Caucasian (41.8%)
 - 2 Hispanic (3.6%)

Results

- ▶ 45 of 55 eligible patients (81.8%) had documented foot exams using the template.
 - Most exams were comprehensive with monofilament, vibratory, and visual exam
 - 2 ulcerations to ankles, 1 small ulceration to left foot were noted.
- ▶ Of the 10 eligible that were not done:
 - 4 refused
 - 5 were forgotten, one of which was a walk-in
 - 1 was diagnosed on day of exam

Results

- ▶ Observations from project leader journal revealed barriers to full implementation:
 - Time for sock and shoe removal and replacement
 - Nursing staff forgot put out monofilament (cue for exam)

Results

- ▶ The team met together to discuss next steps.
 - Decided that the project aims were met and decided to keep going with the current flow.
 - In the next cycle, will add teaching self foot exams.

Discussion

- ▶ The change resulted in an improvement from 33% to 81.8% (45 of 55) documented foot exams
- ▶ 3/45 completed foot exams revealed ulcerations. (2) ankle (1) foot
- ▶ Foot exam not done on 10 patients
 1. 4 refusals- embarrassed since feet not looked at in a while.
 2. 1 diagnosed with diabetes at the encounter
 3. 5 forgot (we just got off the process)

Discussion

Strengths	Weaknesses
Project encouraged us to resume foot exam after the worst of the COVID-19 crisis	Vaccine rollout was under way and we still had to be cautious not to linger in the rooms
Huddles encouraged good communication, correction, and redirection	I was not able to have data tabulated via the IT staff due to cyber attack and computer updates.
Manual tabulation (more intimate with numbers)	Manual tabulation of data

Discussion

- ▶ General observations:
 - Most foot exams performed with gradual improvement
 - Nurse forgot to prepare room using the planned process, i.e., monofilament out; this process improved with refinement.
 - Huddle critical part of already strong team. Encouraged us to review process and engage in open dialogue.
 - The template saved time by putting documentation components in one location and preventing jumping around.
 - Journal was helpful. It allowed reflection and encouraged leader to review process with team based upon reflection.

Conclusion

- ▶ 81.8 %- foot exam completed--up from 33%. Although less than 100% goal achieved.
- ▶ Template centralized documentation and will make data collection for quality indicators and reimbursement easier.
- ▶ **Lessons learned:**
 - Everything will not go as planned: Be pliable.
 - Manual data tabulation was strength and weakness of the project. It allowed closeness with numbers while being a lot of work

Conclusion

- ▶ Meet with IT prior to project initiation to make sure data collection possible.
- ▶ Great first cycle! 3 ulcers addressed that did not proceed to amputation, which was the goal of the project.

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