INTEGRATING DIABETES GUIDELINES INTO A TELEHEALTH SCREENING TOOL

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Abstract

Diabetes is the seventh leading cause of death in the United States and contributes to long-term complications that are costly to healthcare systems. Twenty-five percent of all veterans in the Veterans Health Administration (VHA) have diabetes. The purpose of this article is to describe the development and implementation of a quality improvement project to embed an evidence-based diabetes screening tool, based on Veterans Affairs/Department of Defense diabetes clinical practice guidelines, into the VHA electronic medical record. The objectives of the screening tool were threefold: to promote evidence-based care, to standardize care coordination, and to promote self-management and proper utilization of resources. Record reviews were conducted to evaluate the effectiveness of the screening tool. Results showed an 88 percent increase in the assessment of annual exams and/or labs, a 16.5 percent increase in disease management assessment and offering of services, and a 50 percent increase in goal-setting activity.

Key words: diabetes, guidelines, telehealth, screening tool

Introduction

Diabetes is the seventh leading cause of death in the United States and contributes to long-term complications that are costly to the healthcare system.[1] The total estimated healthcare cost related to diabetes care for the general population in the United States in 2013 was $245 billion.[2] Diabetes is the leading cause of blindness in adults age 20 to 74 years, and diabetic retinopathy is linked to 12,000 to 24,000 new cases of blindness each year.[3] In 2008, an estimated 202,290 diabetic patients had dialysis or kidney transplants.[4] Also, 60 percent of all nontrauma lower extremity amputations are in patients with diabetes.[5]

Diabetes is equally prevalent and costly among veterans. Twenty-five percent of all veterans in the Veterans Health Administration (VHA) have diabetes.[6] Maciejewski and Maynard (2004) reported that in 1998 the Veterans Administration (VA) incurred $214.8 million in outpatient expenditures and $1.45 billion in inpatient expenditures for veterans receiving diabetes care.[7] Chumbler et al. (2005) reported that two-thirds of veterans with diabetes had lower extremity amputations, and these individuals also had 1.6 times more hospitalizations than veterans without diabetes.[8] Veterans who have diabetes receive 30 percent of all VHA pharmacy prescriptions.[9] Pharmacy expenditures for oral hypoglycemic medications increased from $68 million in 2001 to $103 million in 2002, and more than

$45 million was spent on home glucose-monitoring strips.[10]

The VHA home telehealth program is the world's largest telehealth program. In 2012 the VHA telehealth program provided disease management, monitoring, and education to approximately 70,000 veterans.[11] The VHA defines home telehealth as the use of telecommunications technology to provide clinical care and promote patient disease self-management.[12] Telehealth has been successful in managing diabetes care because it provides for ongoing assessment, monitoring, and case management of patients from their homes and provides the appropriate information to providers and the healthcare system to enable "just in time" care. The use of telehealth technology, combined with case management, increases patient satisfaction, improves outcomes, raises work efficiency, and enhances disease management through collaboration between the patient, care coordinator (CC), and other healthcare team members.[13] Part of the success of the program is the synchronization of each veteran's biometric data into an electronic medical record (EMR). However, EMRs cannot improve outcomes unless they are combined with standardization and best care practices.[14] A well-defined, evidence-based, trackable documentation tool embedded in the EMR can help ensure that veterans receive quality care.[15] Until this project began, the VHA's telehealth program had no documentation tool that integrated standards of practice into the EMR. The purpose of this article is to describe the development and implementation of a quality improvement project to embed a diabetes screening tool based on the Veterans Affairs/Department of Defense (VA/DoD) diabetes clinical practice guidelines (CPGs) into the EMR.

Veterans enrolled in home telehealth submit biometric data through a home monitoring device. For diabetes, the biometric data include glucose readings, blood pressures, and weights. Veterans also submit responses to assessment questions such as "Do you have any new sores on your feet or legs?" and "Are you taking your diabetes medications as ordered?" The data are transmitted to a secure portal where they are reviewed by assigned registered nurse CCs. Each CC interprets the data, integrates individual clinical judgment, provides interventions as needed, and documents the interaction in the veteran's EMR. While the VHA home telehealth program does have current and appropriate diabetes CPGs, they were not routinely utilized by CCs to guide disease management decisions. Also, no screening tool that integrated the VA/DoD diabetes CPGs into practice was available. CCs used their own clinical judgment and experience when performing and documenting diabetes services. This practice can lead to potential gaps in coordination and standardization of care. Therefore, the CPGs needed to be embedded into daily practice to promote evidence-based care, enhance standardization of care, and support proper utilization of resources.[16]

In this project, a screening tool that included diabetes standards of care was developed. The tool was designed and embedded into the EMR to prompt CCs to evaluate each veteran's need for diabetic services (annual labs, eye exams, foot exams, smoking cessation, etc.) and guide the CCs to

facilitate the required care in a timely manner. Integration of the CPG-based screening tool into the current EMR can provide ease and convenience of use and ensures that biometric data are available to all healthcare providers.

Background

Diabetes is a complex disease process that requires continuous medical care with multifactorial risk reduction strategies to achieve glycemic control.[17] To achieve tighter glycemic control and improve outcomes, diabetes guidelines provide recommendations for screenings, management, and patient education. These guidelines were developed on the basis of published, peer-reviewed, randomized controlled trials. Two well-respected guidelines, the American Diabetes Association and VA/DoD guidelines, reference landmark studies that substantiate recommendations for tight glycemic control. In the Diabetes Control and Complications Trial (DCCT), patients with tight glycemic control reduced their risk of retinopathy development by 76 percent and reduced their risk of early nephropathy (microalbuminuria) by 39 percent.[18] The second landmark study, the United Kingdom Prospective Diabetes Study, found that patients with tighter glucose control had an A1c level of 7.0 percent (compared to 7.9 percent in the conventional group), a 12 percent lower risk of any diabetes-related endpoint, a 10 percent lower risk of any diabetes-related death, and 6 percent lower all-cause mortality.[19]

To contain costs and improve outcomes, diabetes management has taken many forms in recent years. Telehealth lends itself well to the management of diabetes because it provides more convenient and frequent monitoring than is typically available through regular office visits or phone contacts. A systematic review by Polisena et al. (2009) involved 26 studies (including 5,069 patients) of home telehealth for patients with diabetes. Twenty-one studies evaluated home telehealth, and five randomized controlled trials assessed telesupport. Home telehealth was found to have a positive effect on glycemic control (as evidenced by lower HbA1c levels) compared with usual care patients (weighted mean difference = −0.21; 95 percent confidence interval, −0.35 to −0.08). The telehealth studies also indicated that home telehealth helps to reduce the number of patients hospitalized and also reduces the bed days of care for those that were hospitalized.[20] Luchsinger et al. (2011) found that elderly patients, with the case management intervention of an assigned diabetes nurse and a telemedicine unit in the home, had slower global cognitive decline (p = .01) and improved HbA1c (p = .03) over a five-year period when compared to the usual care group, which only received clinical care from their primary care providers.[21] In 2011, a randomized control study by Bujnowska-Fedak et al. found that patients that were given an in-home wireless glucose monitor and transmitter had lower A1c values, fewer reported hypo- and hyperglycemic episodes, and higher reported quality of life scores than patients receiving conventional care.[22] The Informatics for

Diabetes Education and Telemedicine (IDEATel) project was a large, five-year randomized trial measuring glycemic control. It found that telemedicine interventions including regularly scheduled home telehealth visits with a diabetes educator, review of glucose readings, individualized goal setting, and web access to educational materials can reduce racial/ethnic disparities in glycemic control in older underserved adults.[23]

The VHA implemented home telehealth in 2003 as an initiative to transition from hospital-based care to patient-centered care. Chumbler et al. (2005) found that veterans in home telehealth had a 50 percent reduction in inpatient use, an 11 percent reduction in emergency room use, and a three-day decrease in bed days of care.[24] Barnett et al. (2006) assessed healthcare use among veterans with diabetes in the VHA telehealth program and contrasted it with the healthcare utilization of a comparison group of veterans with diabetes not enrolled in the program. Results showed that the patients in the home telehealth program had reduced avoidable healthcare services for diabetes mellitus (such as hospitalizations) and reduced care coordinator–initiated primary care clinic visits.[25] Chumbler et al. (2009) compared mortality risk for patients enrolled in telehealth (n = 387) with a retrospective control group (n = 387) over four years. Significantly more deaths occurred in the control group (26 percent) compared with the intervention group (19 percent). Also, the intervention group had longer survival compared to the control group (mean survival time 1,348 vs. 1,278 days; p = .015).[26] Stone et al. (2010) compared glycemic outcomes in a randomized controlled study of patients receiving telehealth interventions. One group (n = 73) received home telemonitoring combined with active medication management by a nurse practitioner, whereas the other group (n = 77) received a monthly care coordination telephone call. Baseline results were similar in both groups, with mean A1c of 9.4 percent (care coordination group) and 9.6 percent (home telemonitoring with nurse practitioner management). The home telemonitoring with nurse practitioner management group demonstrated significantly larger decreases in A1c at three months (1.7 vs. 0.7 percent) and six months (1.7 vs. 0.8 percent; $p < .001$ for each), with the most improvement occurring by three months. An overall finding was that both interventions improved glycemic control in patients who previously had inadequate control.[27]

The diabetes screening tool introduced in this project adds another dimension to the VHA's existing telehealth program. It enables evaluation of care coordination interventions for annual screenings, ongoing diabetes education, and patient self-management. In addition, it offers the potential for future research to measure the tool's effectiveness in long-term glycemic control (for example, by measuring follow-up A1c levels).

Approval for this quality improvement project was granted by both the Southeast Louisiana Veterans Health Care System Institutional Review Board and the University of Alabama Institutional Review Board. A password-protected Excel spreadsheet was used to collect and count intervention outcomes; all data were de-identified so that no individual veteran or CC could be identified.

Methods

Organizational Assessment

The Conditions of Participation for VHA Telehealth Services require that each Veterans Integrated Service Network (VISN) telehealth program identify performance indicators for performance improvement. These indicators include such things as resource utilization, clinical outcomes, and patient satisfaction.[28] The telehealth staff in VISN 16's community-based outpatient clinics recognized that the program did not include a standardized screening and reassessment tool to document diabetes care. This issue qualifies as a performance indicator, and an organizational assessment was done using a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis (see Appendix A) to further define the problem.

Population

This telehealth project was implemented in the five VHA facilities in the Gulf Coast region of VISN 16. The five facilities are located in Biloxi, MS; Mobile, AL; Pensacola, FL; Fort Walton Beach, FL; and Panama City, FL. Inclusion data for home telehealth diabetes management includes veterans with A1c levels greater than 8, veterans having difficulties managing their diabetes at home, and veterans expressing a strong desire to improve their diabetes management skills. Veterans also had to have access to a telephone and/or have electric service so that the telehealth monitor could be connected, and they had to have a glucose monitor that interfaces with the telehealth equipment. One CC from each of the five clinics utilized the diabetes screening tool to evaluate 4 patients with diabetes (for a total of 20 patients) who were coming due for a six-month diabetes management review.

Template

The tool was created based on the VA/DoD diabetes CPGs. A hard-copy version of the tool was sent to the information technology (IT) office, and the tool designer and the IT technician collaboratively built a template in the EMR duplicating the information. The template design included simple check items, drop-down boxes, and data input spaces. It had 30 initiatives and was divided into three sections: diabetes care indicators such as annual exams and labs; components of disease management (such as meal planning and exercise); and goal setting (see Appendix B). Several of the template items allowed for autopopulation (such as dates of last labs) or checked marks, with the exception of the goal-setting section, which required narrative descriptive text.

Process

The ten CCs in the Gulf Coast region were e-mailed a letter asking for a volunteer from each clinic to utilize the template, and a CC from each of the five sites was easily obtained. A brief description of how to use the template was given. All CCs were at least baccalaureate-prepared registered nurses. Each CC was given one month to select four patients with upcoming 180-day diabetes evaluations and complete the new screening tool template to document the disease management status versus using the current narrative method of documentation. The project had a total of 20 participants.

After the evaluations were completed, the primary investigator conducted record reviews and counted the number of assessments and/or interventions completed at the previous 180-day evaluation and counted how many were completed after being guided by the screening tool template. The Plan-Do-Study-Act (PDSA) method, also known as the Plan-Do-Check-Act (PDCA) cycle, was used as the quality improvement guide for this project. PDSA works well to verify and prioritize problems because it is a continuous, cyclic process that builds on processes that work and eliminates those that do not.[29]

Outcomes

Section 1 of the screening tool guided assessment of standard diabetes care indicators such as annual labs, immunizations, and/or appointments. Utilizing the screening tool increased the assessment of annual exams and/or labs by 88.12 percent (see Table 1). Prior to guidance by the screening tool, checking for completion of annual exams (other than the A1c) was not routinely assessed by CCs. Section 2 of the screening tool involved diabetes management and assessed items such as A1c trends, blood pressure, and self-management skills such as medication compliance and meal planning. Utilizing the screening tool increased the disease management assessment and the offer of diabetes management services by 16.5 percent (see Table 2). There was a noted increase in assessing for smoking cessation desire, the need for advance directives, and enrollment in My HealtheVet (the VHA's e-health website). Section 3 of the screening tool consisted of assessing the veteran's diabetes concerns and then collaboratively setting measurable goals for the next 180 days. Use of the screening tool resulted in an increase of 50 percent in goal-setting activity (see Table 3). The most noted difference between the pre- and postintervention phases for goal setting was in assessing the diabetes concerns of the veteran.

Discussion

All three sections of the diabetes screening tool resulted in an increase in diabetes assessments and/or interventions. Section 1 (diabetes care indicators) and section 3 (the goal-setting section) showed the greatest increases in assessments. However, just because an assessment was

completed does not necessarily mean that an action was taken. For example, in the record screening section, each of the components was assessed and a date was entered. In the diabetes management section, the majority of components were assessed and required a “yes” or “no” answer. Often no intervention was offered or documented as being offered. An explanation for this finding may be that prior to the use of the screening tool, the CCs were not given detailed training on how to use this section for coordinating care. In the future, it may be beneficial to provide each CC with a handout on what each service (i.e., the weight management program MOVE!, Clinical Video Telehealth Smoking Cessation, diabetes management by a clinical pharmacy specialist) can provide.

Also, the importance of documenting the services offered (even if rejected by the patient) needs to be stressed to CCs. This documentation will demonstrate care coordination efforts and assist in building a comprehensive plan of care. Additionally, further studies are needed to determine how many of the interventions that were offered and accepted by the patient (such as a dietary consult) were actually completed. The goal section of the screening tool showed a significant increase in patient involvement. Asking patients to identify their diabetes concerns promotes participation in goal setting. Collaborative goal setting is a key component of telehealth services because it promotes patients’ self-management skills. Self-management skills increase patients’ ability to make informed decisions and accept responsibility for their own actions and behaviors, which in turn results in improved adherence to treatment plans that they helped to formulate.[30]

For project evaluation, a telehealth conference was conducted after all coordinators completed veteran reassessments and the primary investigator completed the record reviews. The telehealth conference included the CCs, the IT technician, the lead CC, a nurse educator, a Joint Commission officer, and the primary investigator. The primary investigator discussed the results of the use of the screening tool, that is, how many interventions were assessed and how many interventions were offered. The CCs gave verbal feedback on the use of the screening tool. Each felt that the first section of the screening tool, the record review portion, was too time consuming. The IT technician confirmed that all the annual screening items in section 1 could be configured to be autopopulated with the click of a button. No issues were identified with the second or third section of the tool. Each CC commented positively on the structure and standardization of the tool. The tool was sent back to the IT office for the three revisions: autopopulation of the annual screening dates, the addition of a noncontact box to be checked if the CC cannot reach the patient, and the addition of the five standard patient education assessment questions.

Conclusion

This article describes the development and implementation of a quality improvement project to embed a diabetes screening tool based on the VA/DoD diabetes CPGs into the VHA’s EMR. The current VHA EMR has standard preventive health alerts (smoking cessation, colon screening,

mammography, etc.) built into its system. These alerts are addressed when veterans come in for routine office appointments. Prior to this project, the VHA telehealth program had no documentation tool that integrated preventive health screening data or diabetes standards of practice. The existing VHA EMR preventive health alerts that specifically pertain to diabetes management are now being autopopulated into the screening template (in the record review section). However, the diabetes screening tool goes further than just autopopulating preventive screening data. It includes sections on disease management and mutual goal setting. The screening tool benefits the VHA by providing a standardized documentation tool based on established CPGs and proper utilization of available resources. It benefits CCs by providing an organized tool that is based on evidence-based practice and is easily accessible as a template in the EMR. It benefits patients by providing a comprehensive diabetes assessment and offers them increased involvement in their diabetes management. The screening tool may also contribute to the existing body of telehealth knowledge. Future studies could be done to determine the potential benefits in terms of improved glycemic control, reduction of complications, and expenditure on diabetes care and management by comparing patients whose care is guided by the template to those whose care is completed in the usual manner.

After completion of this project, the screening tool was approved by the Veterans Health Education department and the Informatics Nursing Committee. It was also formally presented to the Performance Improvement and Research Committee as a telehealth process improvement initiative. The screening tool has been added to the EMR and is now being used by the telehealth CCs in the Gulf Coast clinics. After one year, the primary investigator will assess the CCs' endorsement (or lack thereof) of the screening tool. If the tool is well received, the next step will be to formally present the screening tool to the VISN 16 Office of Telehealth Services for acceptance as a national telehealth template within the next year.

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