Improving Diabetes Care Delivery in an Integrated Health Clinic

By

Jane Robinson, MSN
University of Kansas School of Nursing

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Dr. Diane Ebbert
_____
Faculty Project Committee, Chair

Dr. Moya Peterson
_____
Faculty Project Committee, Co-Chair

Libby Graham, APRN
_____
Faculty Project Committee, Co-Chair

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_____
Date Project Proposal Accepted

The DNP Project committee for Jane Robinson certifies that this is the approved version of the following DNP Project:
Improving Diabetes Care Delivery in an Integrated Health Clinic

Dr. Diane Ebbert

_____

Co-Chair

Dr. Moya Peterson

_____

Co-Chair

Date Approved:
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Abstract

People with serious mental illness (SMI), as a population, are typically underserved and likely to have barriers to accessing primary care services. When these patients do seek primary care, it is often fragmented and communication between multiple providers lacks efficiency and coordination. A co-located primary care clinic was recently established in a large behavioral health setting to improve access to primary care for this population. Prior to opening the clinic, of 499 client survey respondents, 82 indicated they needed help managing their diabetes. Multiple providers with varied backgrounds are providing care in the new clinic setting where potential gaps in the delivery of diabetes related care are likely. The purpose of this project is to evaluate the care provided to patients with type 2 diabetes mellitus in the primary care clinic by multiple providers compared to the standard of medical care for diabetes management according to the American Diabetes Association (ADA) 2015 guidelines. A retrospective chart review using a standards checklist based on the ADA guidelines was implemented to evaluate care provided by a number of different providers. Identified gaps in care, potential improvements in documentation and use of the checklist as a tool for improving delivery of care to meet standards were shared with providers in a post-study discussion.

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Statement of the Problem

The clinical question this project addresses is whether primary care providers at a select behavioral health clinic are demonstrating use of best evidence in diabetes management. In a large behavioral health setting, a co-located primary care clinic was established three years ago by a three party community coalition. The behavioral health organization, a community health care system and a school of nursing partnered to establish a co-located primary care clinic with the purpose of improving access to primary care for the behavioral health patient population. This community behavioral health center provides care for people with diagnoses such as psychosis, schizophrenia, bipolar disorder, personality disorder, mood disorders and substance abuse disorders.

People with serious mental illness (SMI), defined in the literature as people with diagnoses such as these, as a population, are typically underserved and likely to have barriers to accessing primary care services (Bradford et al., 2008; De Hert, Correll, et al., 2011). When these patients do seek primary care, it is often fragmented and communication between multiple providers lacks efficiency and coordination (SAMHSA, 2014). In the county where the clinic is located, in 2012 an estimated 4,631 residents had an SMI diagnosis (KanCare, 2015). The behavioral health center, a part of this primary care coalition, is where many of those residents seek and obtain their mental health care.

The behavioral health management team surveyed their clients before the primary care clinic opened three years ago to ask what health problems they needed help managing. Of 499 client responses, 82 indicated that they needed help managing their diabetes (Valeo Behavioral Health, 2013). The identification of this need is consistent with current research noting an increased prevalence of type 2 diabetes mellitus as well as other cardiometabolic disorders in the

behavioral health population. A variety of reasons are cited in the literature that contribute to this phenomenon including: side effects of pharmacological therapies, loss of energy, greater concern for mental health over physical health, high smoking rates and cognition changes to name several (Buhagiar, Parsonage, & Osborn, 2011; Cimo, Stergiopoulos, Cheng, Bonato, & Dewa, 2012; De Hert, Correll, et al., 2011; Richardson et al., 2005)

Purpose Statement

The purpose of this project is to evaluate the care provided to patients with diabetes in the primary care clinic by multiple providers compared to the standard of medical care for diabetes management according to the American Diabetes Association 2015 guidelines.

Concept Definition

The primary concept in this project statement is "the standard of medical care for diabetes management". This concept is defined in the literature as a care standard based on recommendations by the American Diabetes Association (ADA) for both diabetes mellitus type 1 and type 2. The primary reference is the current American Diabetes Association (2015) document of evidenced-based recommendations for meeting standards of medical care for patients with either type of diabetes. These recommendations are updated annually by a professional practice committee of medical and health care professionals based on literature reviews of the strongest and most current research evidence related to diabetes care and management. Recommendations for blood glucose levels, appropriate lab testing, annual dilated eye exams, foot care and education support, as examples, are all addressed in the 2015 document.

The subject of the project is the group of primary care providers who are providing care for the physical needs of this patient population in this integrated clinic. The three primary care providers are certified nurse practitioners who have a variety of backgrounds in adult health

management. This project will not include those providers in the clinic who are focused on the behavioral health management concerns of the patients. There is a clear distinction in the clinic between the management of behavioral health concerns and physical health issues. The project emphasis on disease management leads to a purpose focused on the care that providers are delivering to the patient population rather than particular patient responses. That is, this project will focus on what providers are doing or not doing in their provision of care for patients with diabetes rather than on patient responses to particular treatments or interventions.

Operational Implementation

The care standard concept will be operationalized by a checklist based on the 2015 ADA standards of care. In order to organize the ADA recommendations, a checklist was developed to evaluate each primary care visit that involves a patient with diabetes. The goal was to keep things clear, simple and in short format making the checklist more likely to be used and endorsed by providers (Watkins et al., 1999). The checklist can then be utilized as an ongoing auditing tool employed for chart reviews to determine the extent to which care standards are being met in the care provided and documented in patients' charts with each follow-up visit for diabetes care. A literature review was undertaken to identify any similar checklist already in use. Two research studies were identified with checklists and are highlighted in the literature review. With this background and based on the ADA 2015 standards of care, a tool was created to guide the chart review (see Table 1).

Once a baseline of care is determined in the chart review, gaps in care can be identified and the evidence-based checklist help guide providers in addressing those gaps with subsequent visits. Pertinent lab work and follow-up can be determined based on those pieces already documented in the patient's chart as done while identifying those parts of the recommended care that still need to be addressed.

Further implications might include that each provider carry out the same checklist of items by dialoguing and follow-up with the patient over each item related to their diabetes care and management. The checklist would not be a permanent part of the patients' chart but rather a tool to guide the encounter so that all areas of the standard care could be addressed or checked off if already done for that time frame. Patient care for diabetes standards is often considered over a one year timeframe because various exams happen on a yearly cycle (i.e. dilated eye exam).

Importance of the Project

The importance of this project to improve diabetes care in this patient population coincides with the potential of the integrated primary care clinic in this behavioral health setting to increase access to primary care services for thousands of residents in Shawnee County with SMI who may not be getting quality, routine primary care services. Indeed, research has shown that mental health clients die as much as 25 years earlier than the general population, primarily due to medical causes rather than suicides and accidental deaths (Parks et al, 2006). The barriers to care and the fragmentation of care in the current system make navigation for care particularly challenging in this population as has been noted. In fact, the ADA (2015) professional practice committee has identified these three priorities for improving patient care 1) optimize provider and team behavior 2) support patient behavior change and 3) change the care system.

With this effort to design work flow for effectiveness and efficiency while collaborating to systematically solve problems and enhance improvement as promoted in a lean business model (Mazzocato, Savage, Brommels, Aronsson, & Thor, 2010), and by systemizing the standards of care for diabetes management into a user friendly provider checklist, this project addresses the first ADA objective as it relates to providing care for a complex chronic process like diabetes. The second objective can be targeted with this project by focusing on care standards in order to produce better outcomes for patients with co-morbid diabetes and SMI. The integration, it is

hoped, will increase the intensity and regularity of follow-up visits as the team establishes relationships in the primary care clinic with patients that have been historically and likely, in reality, underserved. The third ADA objective is addressed through this novel approach of the integration of primary care into the behavioral health center to maximize the potential to primary care access for this population. Integration of care is enhanced when co-location of services is offered to patients with SMI (Druss, Rorhbaugh, Levinson, & Rosenheck, 2001).

Literature Review

A systematic review of the literature related to diabetes care management in primary care and in the population of patients with an SMI diagnosis was done. The databases CINAHL, Medline and ERIC were searched with the search terms of diabetes mellitus type 2, intervention, education, behavioral health and mental health. The search was refined to capture academic journals, peer reviewed research articles and dissertations from 2010 to the present. The Cochrane Library was also searched for potential systematic reviews related to the topic. Eighteen articles were identified and reviewed for findings pertinent to this project. In addition, a search was taken from the same databases to identify any diabetes care standards, tables or checklists used in research by adding the search terms standards, tables and checklists. Two research articles were identified from this further search.

Diabetes in the Seriously Mentally Ill Population

The SMI population were found to be at increased risk for diabetes, obesity and pronounced modifiable risk factors related to lifestyle choices (Buhagiar et al., 2011, Cully, 2014, De Hert et al., 2011). There is also evidence that these modifiable risk factors are often not addressed by providers during routine patient primary care visits (De Hert, Cohen, et al., 2011). The literature does suggest that in the treatment of diabetes in patients with the specific SMI of schizophrenia, diabetes education is effective when targeting diet and exercise by addressing challenges like

cognition, motivation & weight gain (Cimo et al., 2012). Intensifying support with standardized visits and case management can significantly improve patient diabetes related outcomes in the SMI population (Chiverton et al., 2007). The evidence is mixed as to whether a co-located primary care setting significantly impacts patient outcomes. Druss et al., (2001) in a randomly controlled trial (RCT) found better integration of care when physical and behavioral health care providers were co-located in the same clinic space.

Long et al.,(2014) found glucose control and diabetes medication adherence among patients with SMI who received collocated care was only slightly better but not significantly improved compared to standard care.

Diabetes Management in Primary Care

The literature review reveals an abundance of research and care standards for type 2 diabetes mellitus. A primary reference for this project is the current American Diabetes Association (2015) document that serves as the evidenced-based standard of care for patients with diabetes in the primary care setting. Other references document the impact of group versus individualized approaches to diabetes related interventions (Weinger et al., 2011). Evidence supports the use of both approaches to impact positive outcomes for patients with a diabetes diagnosis (Duke et al., 2009, Fan & Sidani, 2009). In addition, the use of the patient centered medical home model has proven to have a positive impact on the management of patient outcomes related to diabetes (Jortberg et al., 2012).

Diabetes Care Checklists in the Literature

Two studies were found that utilized checklists to examine and evaluate diabetes related care. A table consisting of 18 distinct items (though cholesterol parameters are five of those items) was developed by Harris et al., (2013) using the Canadian Diabetes Association Practice Guidelines as care standards. These items were then identified with the use of the checklist in the

charts of patients with type 2 diabetes retrospectively and tabulated to determine the level of care delivered in the course of routine primary care follow-up visits for diabetes management. In a separate study, use of multiple clinical guidelines from the International Diabetes Federation to the American Diabetes Association were utilized to define standards of diabetes care. Nine items were included to measure the quality of care provided in diabetes related visits in a post-educational intervention study that was implemented in the primary care setting (Vidal-Prado, Perez-Castro, Lopez-Alvarez, Santiago-Perez, Garcia-Soidan, & Muniz, 2013).

Both of these tables from the literature were used as guides in the development of the checklist for this project. Neither table completely embodied the care standards identified by the American Diabetes Association (2015) though there are many items that are common to all of them such as hemoglobin A1c measures, blood pressure monitoring and foot examinations. The checklist for this project lists 16 items from the ADA guidelines as standards of care including four markers for cholesterol as found in Table 1.

Theoretical Framework

A Continuous Quality Improvement approach to this project was undertaken with a Plan-Do-Study-Act framework (Melnyk & Fineout-Overholt, 2011). The Plan-Do-Study-Act model is a good fit for this clinical project which investigates care delivery by multiple providers compared to an evidence–based standard. Gaps in the care currently provided can be identified as well as areas for potential improvement in the electronic health record (EHR) related to diabetes care and documentation. The checklist itself may prove to be a useful tool to guide future care delivery. While data gathered can help identify gaps, it is likely that further Plan-Do-Study-Act efforts will need to be implemented in a cyclical fashion in order to address the gaps identified

and validate improvements with ongoing effort from staff to improve the quality of diabetes related care delivery.

Author's Assumptions

The author begins this project with a number of assumptions. Multiple providers with varied backgrounds and experience will have more or less experience in managing diabetes mellitus type 2 in the adult patient. Gaps in care provided at the primary care clinic related to diabetes management likely exist as compared to the 2015 ADA standards of care. Evaluating care provided will offer opportunities to identify gaps in care, implement the evidence-based care standards and improve patient outcomes. Additionally, it is assumed that provider staff are motivated to provide diabetes care according to 2015 ADA evidence-based standards of care. Some parts of the standards checklist may be completed by support staff or students (i.e. blood pressure and weight measurement). Care provided will be evaluated in a retrospective fashion through chart review of the documented care.

Project Methods

Project Design and Rationale

The Plan-Do-Study-Act (PDSA) approach to continuous quality improvement with a descriptive, retrospective chart review is the design plan for this project. The project plan was submitted for approval to the Kansas University Medical Center Human Research Protection Program for designation as a quality improvement project for which it gained approval (Appendix 1). The project plan was then submitted to the St. Francis Health Center Pharmacy and Therapeutics Committee and approval was gained for this study to be implemented within the St. Francis Health System. The cyclical nature of the PDSA approach with the rapid implementation of findings is well suited for this clinical problem and care setting. Delivery of

high quality, primary patient care in the context of diabetes management is the goal and the results of the PDSA project will bring the diabetes care standards quickly into focus for the providers and for any students who may also be training in the clinic.

A retrospective chart review of charts identified with the ICD 9 &/or ICD 10 codes for diabetes type 2 have been examined. Those codes include: diabetes mellitus type 2 (DMT2) without complication 250.00, E11.9, E13.9; DMT2 with hyperglycemia 250.02, E11.65; DMT2 with other unspecified complication 250.10, 250.12, E11.69; DMT2 or other unspecified diabetes with hyperosmolarity 250.20, E11.00, E11.01, E13.00, E13.01; DMT2 with renal manifestations 250.42, E11.21, E11.65; DMT2 with ophthalmic manifestations 250.50, 250.52, E11.13, E11.319, E11.321, E11.331, E11.339, E11.341, E11.349, E11.351, E11.359, E11.36, E11.39, E13.311, E13.319, E13. 321, E13.43, E13.44, E13.49, E13.610, E13.329, E13.331, E13.339, E13.341, E13.349, E13.351, E13.36, E13.39; DMT2 with neurological manifestations 250.60, E11.40, E11.41, E11.42, E11.43, E11.44, E11.49, E11.610, E13.40, E13.41, E13.42; DMT2 with peripheral circulatory disorders 250.70, E11.51, E11.52, E11.59, E13.51, E13.52, E13.59; DMT2 with other manifestations not stated as controlled 250.80, E11.618, E11.620, E11.621, E11.622, E11.628, E11.630, E11.638, E11.649, E13.618, E13.620, E13.621, E13.622, E13.628, E13.630, E13.638, E13.649; DMT2 with unspecified complication 250.90, 250.92, E11.8, E13.8.

The retrospective chart review, was done in July 2016 with a look back to July of 2015 in order to capture an entire year's worth of care from the primary care provider team. The review was completed by the project director. A diabetes care standards checklist (see Table 1), based on the literature review, was used to guide the review of charts and systematically identify the items of care provided or omitted. The care can then be compared to the standards as defined by the ADA in the 2015 standards of medical care guideline. A weakness of this approach is that

care may have been provided that was not subsequently documented and, in a busy clinic environment, documentation may be truncated in an effort to save time. An additional weakness is that patients who suffer depression or other mental health conditions have higher 'no-show' rates as compared to those without behavioral disorders (Kaufman, McDonnell, Cristofalo, & Ries, 2012) and this could effect that rate at which diabetes care encounters occur and yearly exams are implemented. All areas in the EHR where the standardized items of interest could have been documented were examined for each visit including the history of present illness, vital signs, physical examination, laboratory ordered and treatment plan sections in order to be thorough in the review of documented care. With the chart review complete, the PDSA model can be followed in an ongoing way to address gaps in care with a continuous improvement approach.

Project Sample

At present, three nurse practitioners (NP) are the care providers staffing the primary care clinic. These providers have a range of experience; two of the providers are trained as family nurse practitioners (FNP) and one as an adult/gerontology NP. All are board certified in their specialty areas. One FNP has 15 years clinical experience as a family nurse practitioner in student health at the secondary and higher education levels, one has seven years' experience in adult primary care and the adult NP has six years' experience in adult acute, chronic care and foot care management.

In this clinic setting, one provider staffs the clinic daily on each of four days per week that the clinic operates. Approximately 30 hours of adult primary care is thus provided to consumers each week. Support staff include a clinic licensed practical nurse and a patient care technician. This staff provides support with administrative tasks and basic patient assessments like blood pressure and weight measurements.

An EHR system for documentation of patient care delivered and treatment plans is in place. The current EHR provides no prompts or reminders related to the timing or completeness of diabetes related care. There is a template for documenting a diabetes related office visit in the current EHR system.

Selection Process for Chart Sample

Approximately two patients per day are seen in the clinic with an ICD diabetes diagnosis. Therefore, there is the potential for approximately 32-40 diabetes related care encounters each month that the clinic runs at full capacity. Although the numbers of patients with type 1 diabetes is unclear, by far the majority of the consumers that present with diabetes in this setting are those with the type 2. For this reason, the focus of this project is on the type 2 diabetes care management encounters. Inclusion criteria for chart review is: type 2 diabetes diagnosis, follow-up or initial visits for diabetes management, and adults over the age of 18 years. Charts of patients seen by the project director were omitted from the project sample in order to ensure the validity of the data. Co-morbidities are not considered as exclusionary in this review although number of co-morbidities have been documented for each patient chart included in the review.

Data Collection Methods

As has been noted, the 2015 ADA standards of medical care for diabetes management is the guideline used for identifying the items included in the standards checklist. The studies previously mentioned also served as background for devising the checklist format. Sixteen items are identified for inclusion and are fully described in checklist format on Table 1. These items include: evidence of measurement of blood pressure and weight; screening for depression; counseling for physical activity and smoking cessation; and documentation of biannual hemoglobin A1C testing. Annual documentation of recommended kidney function tests, dilated

eye examination, and foot examination are also listed. Cholesterol testing is recommended to be examined every one-two years and is listed accordingly.

Two local content experts were enlisted to review the contents of the checklist prior to use in order to provide validation for the items included. One is an NP practicing in a primary care clinic that sees a comparable population to that of this study. The other is a practicing NP with seven years' experience caring for adult patients with diabetes in an endocrinology clinical practice.

A simple yes/no approach to the documentation of care items listed on the checklist will be employed. Review of examinations, laboratory ordered, and treatment discussion and planning will be included in the review. In addition, up to one year of patient related care will be examined in order to capture those items on the checklist that are recommended for annual inspection such as foot care, dilated eye exams, and kidney function related lab work. An item must be documented in the chart at least once in order to be counted in the yes category. An "other" category was also enlisted by the project director to note any circumstances that are contributory or unique in the charting that may illuminate the potential for EHR changes that could facilitate charting improvements and to note any unique patient features. The other data collected includes gender, age, number of documented co-morbidities, number of visits within the study timeframe and whether the patient was receiving narcotic pain management.

Access to the EHR system was obtained through the health system administrator. A request was made to identify, with the use of specific ICD codes, the patient population with diabetes mellitus type 2. These include those codes noted earlier in the project design. Strict confidentiality standards were followed in order to maintain patient privacy based on the Health Insurance Portability and Accountability Act standards. All data was de-identified and only data required to determine care as noted on the checklist along with the demographic information

indicated was sought through the review process. Review of charts that reflect care provided by all three of the aforementioned providers were included. Of 127 potential patients identified with an ICD 9 or 10 diabetes mellitus type 2 diagnosis, 34 charts were ultimately reviewed and comprise the chart sample. Some charts were excluded based on care being managed through endocrinology rather than primary care. Others were found to lack current visits. And those patients with documented visits with the project director were also excluded in order to minimize bias. All data collection was performed by the project director in order to provide consistency in an effort to improve reliability.

Data Analysis

Data analysis includes using descriptive statistics to explain the percent of each item of care documented from the standards checklist based on frequency counts. An Excel spreadsheet was devised for frequency counts to be easily recorded while also allowing patterns to be noted. Total percentages of the 16 measures documented are compared in table format in order to identify those items least often performed or documented in the course of diabetes related care (see Table 2). These can then be easily shared with the primary care team in an educational setting with the goal of identifying what is well documented and of improving delivery on those items least often documented. The demographic information gathered is also presented with percentage breakdowns of those variables in Table 3.

Hypothesis tests were conducted using Fisher's exact test and confidence intervals were computed using the Agresti-Caffo method (Agresti & Caffo, 2000). These calculations were done to identify differences in proportions when comparing paired groups. The Fisher's exact test is used when the expected counts in all cells of the 2x2 tables are not at least five, as is the case with this sample. The comparison tables were made using demographic data gathered for gender, age, number of co-morbidities, and number of visits within the study period. For

example, percent of females to males with documented biannual hemoglobin A1c orders were calculated and then compared to identify any significant differences in the care provided based on gender. The Fisher's test was done for all of the care items comparing for differences between female and male patients; 18-40 year olds versus those more than 41 years old; patients with one to three co-morbidities versus four or more; and one to two visits in the study period versus three or more. This allowed for a total of 64 statistical comparisons (see Tables 4-7). If significant statistical differences are found, this could then provide further insight into the variables that may be influencing the implementation of the individual standard items on the diabetes care checklist.

Results

The results of the chart review reveal a number of areas on the standards care checklist that are well covered in diabetes related visits in the clinic by the primary care providers. Those items that are implemented and documented at the highest rates are: weight and blood pressure at 100%, biannual hemoglobin A1c measure at 96%, potassium and serum creatinine at 94% and cholesterol markers at 88%. The recommended depression screening is documented on 62% of the sample charts. The most significant identified gaps in care based on the chart review include: measurement of microalbuminuria, an annual recommendation to document kidney function, was found documented on 0% of the charts and annual dilated eye exam found on only 3% of patients' charts. Several other items with potential for improvement are: discussion of recommended physical activity, documented on 30% of charts and smoking cessation, when appropriate, on 19% of the 34 charts reviewed. Annual foot examination for vascular and sensory changes while documented 74% of the time, would have been recorded at a higher percentage if the required two indicators for the standard would have been documented on five charts where only one indicator was documented. (Those indicators include: tuning fork assessment for

sensation, pedal pulse or circulation validation in the feet, ankle reflexes and monofilament response.) Table 2 and 3 show the complete results of the chart review.

The demographic analysis reveals a patient population that is 62% female and older than 41 years of age 74% of the time. This sample population had more than four documented co-morbidities on 79% of reviewed charts. Co-morbidities include those diagnoses that are documented on the problem list that include non-episodic problems like hypertension, hyperlipidemia, asthma, chronic obstructive pulmonary disease, gastroesophageal reflux disease, arthritis as well as behavioral health diagnoses like depression, schizophrenia and bi-polar disorder. 88% of the charts reviewed showed that this group of diabetic patients had more than three visits to the clinic over the studied period. And of particular interest as we are also studying and implementing a new pain management protocol in this clinic, 44% of this population group was on narcotic pain management therapy during the study period.

The Fisher's exact test comparisons revealed two significant findings in the comparison groups. First, the number of visits, if greater than three, within the study period significantly increased the likelihood of discussion and documentation of smoking cessation (*P* value = 0.0351). Second, again, if the number of visits was three or greater during the study period, the implementation and documentation of depression screening increased significantly (*P* value = 0.0033).

Discussion

The results of the chart review and statistical analysis were shared with the primary care team during two informal educational meetings. All providers were in attendance at one of the sessions. The goal of the gatherings was to share study results and discuss the 2015 ADA standards along with the more recent 2016 ADA care standards for management of diabetes mellitus type 2 in the primary care setting. The only notable change in the 2016 standard from

2015 is the option of a dilated eye exam every two years for patients who have had two consecutive eye exams without evidence of retinopathy. The checklist with the itemized recommendations was presented by the project director. In addition, demographic information, number of visits and co-morbidities as related to the chart review and analysis were explained.

Discussion with the staff followed the introduction by the project director. This included identifying possible variables in the system that could be changed to improve documentation and potentially impact patient outcomes. It was pointed out by staff that the lower depression screening percentage level could have been influenced by the fact that there was a staffing change during the months of July, August and September 2015 when the APRN was implementing dual roles and covering the responsibilities of the of the nursing assistant in addition to the provider role. The APRN reports being unaware of the need to document the depression screening as part of that role. When the support staff was back at full force, the depression screening resumed. In addition, it was noted that the provider staff was transitioning into new roles over the study period. Two of the providers were new to the clinic and that may have impacted the documentation of care. The identified gaps in care and improvements for documentation of care with use of the standards care checklist and plans for a follow-up study in 6-12 months were also discussed in the post-study meetings.

Possible additional areas of study suggested for future PDSA cycles may be to assess the use of first line recommended therapies such as statins and metformin, unless contraindicated, in this diabetic population group. Other suggestions from the providers included comparing insulin users to non-insulin dependent diabetics as a contributing factor to quality of care, evaluating the use of diabetic education referrals, and incorporating point of care hemoglobin A1c measures to provide more timely care.

Conclusion

The NP provider staff is noted to be providing a high level of care to this complex population of patients with diabetes in an integrated clinic setting. Complexity is apparent as 79% of this patient group have more than 4 co-morbidities and yet the NP staff is providing the recommended care of hemoglobin A1c measures biannually 96% of the time, measuring BP and weight at 100%, potassium and creatinine at 94%, annual cholesterol levels at 88%, annual foot exams at 74%. Specific areas targeted for improvement are: annual dilated eye exams, annual urine microalbumin/creatinine ratios ordering, smoking cessation documentation and physical activity discussion. Improvements in these measures were identified as potentially making the greatest impact in the provision of ongoing care and patient outcomes while at the same time being realistic areas for improvement over the next 6-12 months. The suggestions for improving care and documentation included inservicing on the diabetes template in the EHR and utilizing the “favorites” options in the EHR to facilitate ordering of annual microalbumin creatinine ratios. Next-steps in the ongoing continuous quality improvement effort in diabetes care delivery with the Plan-Do-Study-Act (PDSA) model will proceed after the re-evaluation in 6-12 months and as indicated by these future findings.

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Tables

Table 1

2015 ADA Recommendations for Diabetes Management Checklist					
	Chart 1	2	3	…	34
DEMOGRAPHICS					
Sex: M or F					
AGE					
# Co-morbidities: 1-3					
4 or >					
# Visits 1-2					
3 or <					
Pain Management: Yes/No					
RECOMMENDATIONS:					
Found documented on chart	Yes, No, N/A	Yes, No or N/A	Yes, No or N/A	Yes, No or N/A	Yes, No or N/A
Bi-Annual A1c					
Quarterly A1c*					
Blood Pressure**					
Weight/BMI					
Annual: Potassium					
Serum Creatinine					
Microalbuminuria					
Annual: Eye Exam					
Foot Exam***					
Every 1-2 years:					
Total Chol					
Triglycerides					
HDL					
LDL					
Recommend: Physical Activity+					
Smoking Cessation					
Depression Screen					

Note. * For those who are not well controlled or after treatment changes. **Lifestyle and pharmacologic TX for those office based >140/90.***Annual assessment with at least 2 indicators: pedal pulses, 10-g monofilament, 128-Hz tuning fork, pinprick sensation, ankle reflexes, or vibratory perception with biothesiometer.+150 minutes of moderate intensity physical activity with twice weekly resistance training, if not contraindicated.

Table 2

Chart Review Results 2015 ADA Recommendations, n=34			
ADA Recommendations	# of charts Documented or "Yes"/34	# of charts Undocumented or "No"/34	% of charts Documented Care provided
Bi-Annual A1c	32^	1	96%
Quarterly A1c*	4	1	80%
Blood Pressure**	34	0	100%
Weight/BMI	34	0	100%
Annual: Potassium	31^	2	94%
Serum Creatinine	31^	2	94%
Microalbuminuria	0^	33	0%
Annual: Eye Exam	1	33	3%
Foot Exam***	25	9 (5 only 1 marker)	74%
Every 1-2 years:			
Total Chol	30	4	88%
Triglycerides	30	4	88%
HDL	30	4	88%
LDL	30	4	88%
Recommend: Physical Activity+	10	23	30%
Smoking Cessation	4	17 (na=13)	19%
Depression Screen	21	13	62%
Other: ^ indicates 1 patient refused recommended care			

*Note.** For those who are not well controlled or after treatment changes. **Lifestyle and pharmacologic TX for those office based >140/90.***Annual assessment with at least 2 indicators: pedal pulses, 10-g monofilament, 128-Hz tuning fork, pinprick sensation, ankle reflexes, or vibratory perception with biothesiometer.+150 minutes of moderate intensity physical activity with twice weekly resistance training, if not contraindicated. # unique or contributory circumstances of note.

Table 3

Demographic Summary from 34 Chart reviews			
		N of 34 charts	% of Charts
Gender:	Female	21	62%
	Male	13	38%
Age:	18-40 years	9	26%
	41 or older	25	74%
Co-Morbidities:	1-3	7	21%
	4 or more	27	79%
# Visits:	1-2	4	12%
	3 or more	30	88%
Pain Management:	Yes	15	44%

Table 4

Fisher's Exact Test Comparisons by Gender

Group	Test	Level1	Group 1 Results	Level2	Group 2 Results	Risk Difference (%)	Lower CL	Upper CL	P_value
SEX	BiA1cDone	F	20/21 (95.2%)	M	13/13 (100%)	-4.8	-20.2	19.7	1.0000
SEX	QrtA1cDone	F	5/ 6 (83.3%)	M	1/ 1 (100%)	-16.7	-41.5	61.5	1.0000
SEX	BP_Done	F	21/21 (100%)	M	13/13 (100%)	0.0	-14.9	22.4	1.0000
SEX	BMI_Done	F	21/21 (100%)	M	13/13 (100%)	0.0	-14.9	22.4	1.0000
SEX	PotassDone	F	18/20 (90.0%)	M	13/13 (100%)	-10.0	-26.3	16.5	0.5076
SEX	CreatDone	F	18/20 (90.0%)	M	13/13 (100%)	-10.0	-26.3	16.5	0.5076
SEX	MiAlbDone	F	0/20 (0.0%)	M	0/13 (0.0%)	0.0	-22.3	15.5	0.5076
SEX	Eye_Done	F	0/21 (0.0%)	M	1/13 (7.7%)	-7.7	-30.7	11.4	0.3824
SEX	Foot_Done	F	14/21 (66.7%)	M	11/12 (91.7%)	-25.0	-44.1	9.6	0.2062
SEX	TCholDone	F	19/21 (90.5%)	M	11/13 (84.6%)	5.9	-17.2	32.3	0.6272
SEX	TriG_Done	F	19/21 (90.5%)	M	11/13 (84.6%)	5.9	-17.2	32.3	0.6272
SEX	HDL_Done	F	19/21 (90.5%)	M	11/13 (84.6%)	5.9	-17.2	32.3	0.6272
SEX	LDL_Done	F	19/21 (90.5%)	M	11/13 (84.6%)	5.9	-17.2	32.3	0.6272
SEX	PhysRecc	F	8/21 (38.1%)	M	2/12 (16.7%)	21.4	-13.6	43.6	0.2593
SEX	SmkCess	F	2/12 (16.7%)	M	2/ 9 (22.2%)	-5.6	-38.6	27.1	1.0000
SEX	DeprScrDone	F	13/21 (61.9%)	M	8/13 (61.5%)	0.4	-29.1	31.4	1.0000

Table 5

Fisher's Exact Test Comparisons by Age

Group	Test	Level1	Group 1 Results	Level2	Group 2 Results	Risk Difference (%)	Lower CL	Upper CL	P_value
Age_Cat	BiA1cDone	a) 18-40	9/ 9 (100%)	b) 41 +	24/25 (96.0%)	4.0	-27.6	17.5	1.0000
Age_Cat	QrtA1cDone	a) 18-40	3/ 3 (100%)	b) 41 +	3/ 4 (75.0%)	25.0	-38.5	56.3	1.0000
Age_Cat	BP_Done	a) 18-40	9/ 9 (100%)	b) 41 +	25/25 (100%)	0.0	-30.2	13.2	1.0000
Age_Cat	BMI_Done	a) 18-40	9/ 9 (100%)	b) 41 +	25/25 (100%)	0.0	-30.2	13.2	1.0000
Age_Cat	PotassDone	a) 18-40	8/ 9 (88.9%)	b) 41 +	23/24 (95.8%)	-6.9	-38.0	13.2	0.4773
Age_Cat	CreatDone	a) 18-40	8/ 9 (88.9%)	b) 41 +	23/24 (95.8%)	-6.9	-38.0	13.2	0.4773
Age_Cat	MiAlbDone	a) 18-40	0/ 9 (0.0%)	b) 41 +	0/24 (0.0%)	0.0	-13.6	30.1	0.4773
Age_Cat	Eye_Done	a) 18-40	0/ 9 (0.0%)	b) 41 +	1/25 (4.0%)	-4.0	-17.5	27.6	1.0000
Age_Cat	Foot_Done	a) 18-40	8/ 9 (88.9%)	b) 41 +	17/24 (70.8%)	18.1	-19.6	37.8	0.3939
Age_Cat	TCholDone	a) 18-40	8/ 9 (88.9%)	b) 41 +	22/25 (88.0%)	0.9	-32.5	20.9	1.0000
Age_Cat	TriG_Done	a) 18-40	8/ 9 (88.9%)	b) 41 +	22/25 (88.0%)	0.9	-32.5	20.9	1.0000
Age_Cat	HDL_Done	a) 18-40	8/ 9 (88.9%)	b) 41 +	22/25 (88.0%)	0.9	-32.5	20.9	1.0000
Age_Cat	LDL_Done	a) 18-40	8/ 9 (88.9%)	b) 41 +	22/25 (88.0%)	0.9	-32.5	20.9	1.0000
Age_Cat	PhysRecc	a) 18-40	4/ 9 (44.4%)	b) 41 +	6/24 (25.0%)	19.4	-14.3	49.4	0.3999
Age_Cat	SmkCess	a) 18-40	0/ 3 (0.0%)	b) 41 +	4/18 (22.2%)	-22.2	-37.0	39.6	1.0000
Age_Cat	DeprScrDone	a) 18-40	5/ 9 (55.6%)	b) 41 +	16/25 (64.0%)	-8.4	-40.6	24.1	0.7041

Table 6

Fisher's Exact Test Comparisons by Co-Morbidities

Group	Test	Level1	Group 1 Results	Level2	Group 2 Results	Risk Difference (%)	Lower CL	Upper CL	P_value
CoMorbidities	BiA1cDone	a) 1-3	7/ 7 (100%)	b) 4 +	26/27 (96.3%)	3.7	-33.6	16.6	1.0000
CoMorbidities	QrtA1cDone	a) 1-3	1/ 2 (50.0%)	b) 4 +	5/ 5 (100%)	-50.0	-76.1	20.6	0.2857
CoMorbidities	BP_Done	a) 1-3	7/ 7 (100%)	b) 4 +	27/27 (100%)	0.0	-36.1	12.6	0.2857
CoMorbidities	BMI_Done	a) 1-3	7/ 7 (100%)	b) 4 +	27/27 (100%)	0.0	-36.1	12.6	0.2857
CoMorbidities	PotassDone	a) 1-3	7/ 7 (100%)	b) 4 +	24/26 (92.3%)	7.7	-30.7	21.0	1.0000
CoMorbidities	CreatDone	a) 1-3	7/ 7 (100%)	b) 4 +	24/26 (92.3%)	7.7	-30.7	21.0	1.0000
CoMorbidities	MiAlbDone	a) 1-3	0/ 7 (0.0%)	b) 4 +	0/26 (0.0%)	0.0	-13.0	36.0	1.0000
CoMorbidities	Eye_Done	a) 1-3	0/ 7 (0.0%)	b) 4 +	1/27 (3.7%)	-3.7	-16.6	33.6	1.0000
CoMorbidities	Foot_Done	a) 1-3	4/ 6 (66.7%)	b) 4 +	21/27 (77.8%)	-11.1	-48.2	19.9	0.6162
CoMorbidities	TCholDone	a) 1-3	6/ 7 (85.7%)	b) 4 +	24/27 (88.9%)	-3.2	-40.5	18.2	1.0000
CoMorbidities	TriG_Done	a) 1-3	6/ 7 (85.7%)	b) 4 +	24/27 (88.9%)	-3.2	-40.5	18.2	1.0000
CoMorbidities	HDL_Done	a) 1-3	6/ 7 (85.7%)	b) 4 +	24/27 (88.9%)	-3.2	-40.5	18.2	1.0000
CoMorbidities	LDL_Done	a) 1-3	6/ 7 (85.7%)	b) 4 +	24/27 (88.9%)	-3.2	-40.5	18.2	1.0000
CoMorbidities	PhysRecc	a) 1-3	1/ 6 (16.7%)	b) 4 +	9/27 (33.3%)	-16.7	-38.5	27.5	0.6402
CoMorbidities	SmkCess	a) 1-3	2/ 5 (40.0%)	b) 4 +	2/16 (12.5%)	27.5	-12.5	61.3	0.2281
CoMorbidities	DeprScrDone	a) 1-3	3/ 7 (42.9%)	b) 4 +	18/27 (66.7%)	-23.8	-53.0	14.8	0.3868

Table 7

Fisher's Exact Test Comparisons by Number of Visits

Group	Test	Level1	Group 1 Results	Level2	Group 2 Results	Risk Difference (%)	Lower CL	Upper CL	P_value
Num_Visits	BiA1cDone	a) 1-2	19/20 (95.0%)	b) 3 +	14/14 (100%)	-5.0	-21.0	18.3	1.0000
Num_Visits	QrtA1cDone	a) 1-2	1/ 2 (50.0%)	b) 3 +	5/ 5 (100%)	-50.0	-76.1	20.6	0.2857
Num_Visits	BP_Done	a) 1-2	20/20 (100%)	b) 3 +	14/14 (100%)	0.0	-15.5	21.0	0.2857
Num_Visits	BMI_Done	a) 1-2	20/20 (100%)	b) 3 +	14/14 (100%)	0.0	-15.5	21.0	0.2857
Num_Visits	PotassDone	a) 1-2	17/19 (89.5%)	b) 3 +	14/14 (100%)	-10.5	-27.5	15.0	0.4962
Num_Visits	CreatDone	a) 1-2	17/19 (89.5%)	b) 3 +	14/14 (100%)	-10.5	-27.5	15.0	0.4962
Num_Visits	MiAlbDone	a) 1-2	0/19 (0.0%)	b) 3 +	0/14 (0.0%)	0.0	-20.9	16.1	0.4962
Num_Visits	Eye_Done	a) 1-2	1/20 (5.0%)	b) 3 +	0/14 (0.0%)	5.0	-18.3	21.0	1.0000
Num_Visits	Foot_Done	a) 1-2	13/20 (65.0%)	b) 3 +	12/13 (92.3%)	-27.3	-46.4	6.7	0.1077
Num_Visits	TCholDone	a) 1-2	16/20 (80.0%)	b) 3 +	14/14 (100%)	-20.0	-36.5	8.7	0.1261
Num_Visits	TriG_Done	a) 1-2	16/20 (80.0%)	b) 3 +	14/14 (100%)	-20.0	-36.5	8.7	0.1261
Num_Visits	HDL_Done	a) 1-2	16/20 (80.0%)	b) 3 +	14/14 (100%)	-20.0	-36.5	8.7	0.1261
Num_Visits	LDL_Done	a) 1-2	16/20 (80.0%)	b) 3 +	14/14 (100%)	-20.0	-36.5	8.7	0.1261
Num_Visits	PhysRecc	a) 1-2	6/20 (30.0%)	b) 3 +	4/13 (30.8%)	-0.8	-31.5	27.6	1.0000
Num_Visits	SmkCess	a) 1-2	0/11 (0.0%)	b) 3 +	4/10 (40.0%)	-40.0	-73.8	-4.9	0.0351
Num_Visits	DeprScrDone	a) 1-2	8/20 (40.0%)	b) 3 +	13/14 (92.9%)	-52.9	-67.8	-15.5	0.0033

Appendices

Appendix 1

The University of Kansas Medical Center

Human Research Protection Program

Date: April 28, 2016

Project Title:	Improving the Standard of Diabetes Related Care in a Co-Located Primary Care Setting
Institutional Contacts:	Jane Robinson
Sponsoring Department:	School of Nursing

Quality Improvement Determination

Thank you for your submission. The KUMC Human Research Protection Program (HRPP) has conducted a review of the above referenced project.

The current proposed project plan falls under one or more of the following quality improvement activities:

- Determine if a previously-implemented clinical practice improved the quality of patient care
- Evaluate or improve the local implementation of widely-accepted clinical or educational standards that have been proven effective at other locations
- Gather data on hospital or provider performance related for clinical, practical or administrative uses
- Conduct a needs assessment to support changes that will improve care delivery to the local population
- Measure local efficiency, cost or satisfaction related to standard clinical practices
- Develop interventions or educational strategies that improve the utilization of recognized best practices
- Implement strategies to improve communication within our local healthcare environment
- Improve tools for patients that promote education, health literacy or treatment plan compliance

Any presentation or publication resulting from this project should explicitly state that it was undertaken as quality improvement.

At this time, IRB review is not required. If a quality improvement protocol is revised to undertake a systematic investigation designed to answer a research question or produce knowledge that would be generalizable beyond the local setting, the HRPP will re-evaluate your project's regulatory status. More information about distinguishing quality improvement from research is available on the OHRP website at: http://www.hhs.gov/ohrp/policy/faq/quality-improvement-activities/index.html

Very truly yours,

[redacted]

Karen Blackwell, MS, CIP
Director, Human Research Protection Program

Mail-Stop 1032, 3901 Rainbow Blvd., Kansas City, KS 66160
Ph0ne: (913) 588-0942 Fax: (913) 588-5771
kblackwe@kumc.edu

Appendix 2

Proposed Timeline and Budget				
Date	**Who**	**Objectives**	**Implementation**	**Budget**
Nov-15	Jane	Enlist Dr. Ebbert, Chair Capstone Committee		
Dec-15	Jane	Complete NRSG 911 and project proposal		
Feb-16	Dr. Ebbert	Submit for HSC approval		
		Identify other faculty for Capstone committee	*Assist* of Dr. Ebbert	
Summer 2016	Jane	Enroll Capstone		
	Jane	Request feedback from experts re: checklist	*Assist* Dr. Ebbert, Rene Johnson, Stormont Vail	
	Jane	Edit and finalize proposal	*Assist* of Dr. Ebbert, committee	
	Jane	Present proposal for approval		
	Jane	Begin data collection at St. Francis	*Assist* of Paula Ellis and computer access	
June/July 2016	Jane	Data collection		40 hours x 50.00/hr= $2,000.00
Fall 2016	Jane	Enroll Capstone		
	Jane	Project data organization, interpretation		20 hours X 50.00/hr= $1,000.00
	Jane	Initial writing of results		20 hours X 50.00/hr= $1,000.00
Spring 2017	Jane	Final paper with revisions	*Assist* Committee	20 hours X50.00/hr= $1,000.00
	Jane	Oral presentation of project findings		20 hours X50.00/hr= $1,000.00