



Screening for diabetic kidney disease in primary care for the underinsured: A quality improvement initiative



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ABSTRACT

Purpose: Screening rates for DKD in primary care are low, even though diabetes accounts for 44% of all new kidney disease cases. The purpose of this project was to determine if a primary care team for the underinsured improved screening and diagnosis of diabetic kidney disease (DKD) after initiating a quality improvement (QI) process.

Methods: A chart audit with feedback, provider education of clinical practice guidelines, and strategies from TeamSTEPPS™ were implemented with the inter-professional primary care team.

Results: Pre/post-intervention chart audit analysis showed the frequency of ordering microalbumin increased from 50.3% (n = 148) to 75% (n = 148), and diagnosing DKD rose from 3.3% (n = 10) to 10.7% (n = 21) over three months (P = .000).

Conclusion: Implementing a QI process in underinsured primary care centers improved the compliance of proper screening and diagnosing DKD AND introduced inter-professional practice competencies and teamwork strategies not previously recognized at the centers.

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Proper screening and appropriate therapy can prevent or delay many complications of diabetes (American Diabetes Association, 2014; Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group, 2013; National Committee for Quality Assurance, 2014; U.S. Department of Health and Human Services, 2013b). Diabetic kidney disease (DKD), a complication of diabetes, occurs in 20% to 40% of all persons with diabetes and is responsible for 44% of new cases of end stage kidney disease (Centers for Disease Control and Prevention, 2014; Molitch et al., 2015; United States Renal Data System, 2014). Worldwide, the prevalence of diabetes is 9% (World Health Organization, 2012). Low and middle-income countries account for over 80% of diabetes-related deaths (World Health Organization, 2014). For most countries, the largest cost of managing diabetes is hospitalization for diabetes complications (World Health Organization, 2014). Nearly 25% of the US Medicare budget is spent on CKD, end stage renal disease, kidney transplant, and dialysis (National Institute of Health, 2014). As the diabetes epidemic continues, the number of people who develop DKD will increase, further stretching limited healthcare resources (Molitch et al., 2015).

1. Background

International leaders of kidney health recommend yearly screening for CKD in persons with diabetes (Asian Pacific Society of Nephrology,

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2010; British Columbia Medical Services, 2014; Kidney Health Australia, 2015; National Kidney Foundation, 2012). Initial screening should commence five years after the diagnosis of type 1 diabetes and immediately upon diagnosis of type 2 diabetes. Screening should include albumin creatinine ratio (ACR) in a spot urine sample, serum creatinine and estimation of glomerular filtration rate (eGFR). An elevated ACR warrants two additional first void specimens collected in the next three to six months because of ACR's variability, due to metabolic and hemodynamic factors. If the ACR is severely increased (above 300 mg/g), the diagnosis of DKD should be considered. If the ACR is moderately increased (between 30–299 mg/g), the diagnosis of DKD can be made if persons have retinopathy or had type 1 diabetes for the past ten years (British Columbia, 2014; Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group, 2013; Kidney Health Australia, 2015).

Although the prevalence of DKD is staggering, the frequency of screening for DKD in primary care is well below recommended practice guidelines. In a review of the literature, screening rates for DKD, as measured by the frequency of urine microalbumin tests collected in primary care settings, ranged from 0% to 43%. Umar-Kamara and Tufts (2013) assessed the frequency in which micro-albuminuria was collected in a primary care setting to find a total absence of screening for DKD (n = 50). The United States Renal Data System (2014) reports 43% of persons ≥65 years old with diabetes have had the recommended urine albumin test. Other countries that have the largest number of patients with diabetes in the world (China and India) report 11% prevalence of CKD (Jha, Yee-Moon, & Wang, 2012). However, screening rates among large samples (>2000) of community-dwelling persons were 11.3% in Beijing

(Zhang et al., 2007) and 11.8% Shanghai (Chen et al., 2009). Similar reviews of the literature for DKD screening in primary care are congruent with these findings; Anabtawi and Mathew (2013) reported 14% to 49% screening rates in primary care. A *Healthy People (HP) 2020* objective is to increase the proportion of persons ≥ 65 years with diabetes and CKD who receive annually serum creatinine, micro-albuminuria, A1c, lipids, and eye examination to 25.3% (U.S. Department of Health and Human Services, 2013a).

Closely linked to screening is diagnosis of CKD. Ryan, Sloand, Winters, and Corsetti (2007), in a large cross-sectional sample of ambulatory patients, found that 74% of persons ($n = 6895$) with CKD were undiagnosed using two measures of eGFR over three months. Barahimi, Aghighi, Aghayani, and Foroushani (2014) noted a prevalence of CKD diagnosis of 21.5% ($n = 210$) in high-risk patients age 30 and older in rural Iran. Based on these findings in the literature, CKD remains undiagnosed more than 70% of the time.

1.1. Local problem

The majority of persons with diabetes seek healthcare in primary care which is well suited for acute illness and injury, but less equipped to manage chronic conditions such as diabetes and CKD (Corser & Xu, 2009; Greer & Boulware, 2015; Jortberg, Miller, Gabbay, Sparling, & Dickinson, 2012), and may explain the low screening rate of DKD (Goderis et al., 2009). Additionally, those who are underinsured have a higher prevalence rate of diabetes than the general public (Centers for Disease Control and Prevention, 2014; World Health Organization, 2012). Research has shown that QI measures targeted at improving screening rates of DKD in primary care do in fact improve diagnosing DKD (Akbari et al., 2004; Umar-Kamara & Tufts, 2013). Appreciating these healthcare challenges, two primary care centers for the underinsured anticipated gaps in their practice for screening and diagnosing DKD. The primary care centers in this project did not have an established QI process, which further inspired their movement to implement a QI project for detecting DKD. Because there are several laboratory tests and steps in the decision making process when diagnosing DKD, multiple variables were assessed. Each step in the National Kidney Foundation Kidney Disease Outcome Quality Initiative (NKF-KDOQI)TM Clinical Practice Guidelines (CPG) (2012) was assessed for gaps in practice, to establish practice goals. Once the goals were determined, interventions were developed that targeted the weakest performing areas to improve overall screening and subsequent diagnosis of DKD. This project established the QI process at the primary care centers by incorporating strategies of teamwork and interprofessional practice not commonly noted at the centers before the project.

1.2. Intended improvement/study question

The aim of this project was to improve the accurate diagnosis of CKD in those with diabetes, known as DKD, in two underinsured primary care centers. The study question was, “will a primary care team for the underinsured improve screening and diagnosis of diabetic kidney disease (DKD) after initiating a quality improvement (QI) process?”

2. Methods

The university institutional review board approved this project. The charts were number coded and only aggregate data were reported so that persons could not be identified.

2.1. Sample and setting

The project was conducted in two Midwest primary care clinics for the underinsured. The primary healthcare team included Nurse Practitioners (NP), physicians, medical residents, physician assistants, NP students, medical students, nurses, medical assistants, and receptionists. As

a first step, records of all non-pregnant patients with diabetes ($n = 503$) were identified from the adult population of 4397 patients at the two centers. Of these, 24 patients were excluded because they had been referred to nephrology, and 26 were excluded because they did not return for a second visit within 18-months. The resulting pre-intervention project sample was 453 patients. Patient visits during the post-intervention three-month period were cross-referenced to the pre-intervention sample of patients, resulting in a post-intervention sample of 196 patients that returned for a second visit to the clinic. When a patient was seen in the post-intervention period for an issue totally unrelated to diabetes, the visit was counted only if the provider included the diagnosis of diabetes in the assessment or plan sections of the electronic medical record (EMR).

2.2. Planning the intervention

The primary care centers for the underinsured functioned in the context of minimal financial resources and dependence on philanthropic donations. This left little to no resources for a QI program. The leadership style was *laissez-faire* in which many of the primary care providers were part time and volunteered. The full time associates were the nurses, medical assistants, and receptionist who were subservient to the providers. The extent of teamwork was the act of providers delegating to others in which the providers had the final authority on all matters. The providers worked parallel to one another and there were no practice meetings.

A NP-provider led the project by introducing the structure and procedures of the QI process to all associates at both primary care centers. The process was described in sequential steps as: 1) a pre-intervention chart audit to determine gaps in practice, 2) goal setting, 3) interventions specific to gaps in practice, and 4) a post intervention chart audit and analysis to determine if goals were met (Talyor et al., 2013). The structure was described as: 1) a QI process owned by all associates, 2) new behavioral expectations were incorporated based upon the core competencies of interprofessional practice from the *Interprofessional Education Collaborative Expert Panel* (2011), and 3) teamwork strategies from *TeamSTEPSTM* (Agency for Healthcare Research and Quality, 2014). The expectation was established that all associates were to speak up when practice standards were not being met. Team members incorporated new behaviors into daily work flow: medical assistants who triaged persons with diabetes handed out a brochure about the importance of screening for DKD and contributed to patient education; receptionists reminded patients and stressed the importance of having their lab work completed prior to their visits; and providers were open to feedback and ways to improve practice. Mutual respect was encouraged. It was accepted that QI not only creates practice change, it offers change in human behavior and social policy and is impacted through experiential learning (Ogrinc et al., 2015).

After the QI structure and process was implemented at the primary care centers, the NP-provider gave an educational slide presentation describing the practice guidelines for screening DKD (*Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group, 2013*) and presented a summary of the pre-intervention chart audit data in aggregate form, not by provider or provider type. The educational setting took place in one large gathering in a safe environment in which all associates were encouraged to participate.

To maintain the momentum smaller group meetings of providers, medical assistants, nurses, students and receptionists were held every three to four weeks throughout the project. The NP-provider facilitated these meetings encouraging mutual respect, common language and role clarification (Agency for Healthcare Research and Quality, 2014; *Interprofessional Education Collaborative Expert Panel, 2011*). Further interventions included weekly email reminders about the practice guidelines of DKD and the Centers' performance measures, along with journal articles. The medical assistants served as the data abstractors, which enhanced their role in the QI process. It was a way to use their unique and complementary abilities in the QI process (*Interprofessional Education Collaborative Expert Panel, 2011*).

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