

**MULTIPRONGED APPROACH TO IMPROVE DIABETES CARE MANAGEMENT IN  
THE HOME HEALTH SETTING**

by

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## **Abstract**

New care delivery models and approaches to integrated care have emerged across the country to reduce health disparity, improve outcomes, and address care delivery fragmentation. Home health agencies (HHAs) and the millions of homebound adults in the U.S. are often in the middle of this fragmentation. This article describes a multipronged quality improvement (QI) approach taken by an Illinois HHA to reduce variation and improve the care management of its diabetic population. The agency was experiencing variations in care that misaligned with the parent health system, inconsistent documentation, and higher than desired emergency department (ED) utilization, rehospitalizations, and percentage of patients discharged with fasting blood glucose (FBG) levels outside of their target ranges. A team was formed to identify system gaps of care and develop multipronged mitigating interventions. Based on available data, post-intervention the agency had a 29% increase of patients discharged with FBG levels within target range, and a 15.0% reduction in ED utilization. The agency did not improve its rehospitalization rate. The identified limitations that may have impacted project results include the short implementation period, limited timeframe patients are enrolled in home health, agency operational dynamics, and electronic health record (EHR) barriers.

## **Introduction**

Diabetes has emerged as a substantial health problem in the U.S. Approximately 29 million people have diabetes (Centers for Disease Control and Prevention [CDC], 2014). The prevalence of diabetes increases with age. In comparison to 9.3% of the general population, approximately 26% of adults 65 years of age and older have diabetes (American Diabetes Association [ADA], 2016; CDC, 2014). As health care delivery has been shifting from the acute to a variety of ambulatory settings, Medicare-certified home health agencies (HHAs) have experienced increases in census and percentages of homebound older people with more complex chronic diseases and conditions, such as diabetes (Dey, Johnson, Pajeroski, Tanamore, & Ward, 2011). The growth of chronic disease has necessitated the development of new models of care to enhance access and coordination of care delivered across all settings (Brown, Carrara, Watts, & Lucatorto, 2016). Likewise, with the prevalence of diabetes and costs of care on the rise, integrated health care delivery systems must leverage system resources, use evidence based practices, and shift care delivery models to effectively manage the care of homebound diabetic populations. The American Diabetes Association (ADA) has established guidelines of care for outpatient settings; however, due to barriers and care fragmentation these guidelines may not be fully implemented across a health system (ADA, 2016). The millions of homebound adults in the U.S. are often in the middle of this fragmentation (Leff, Carlson, Saliba, & Ritchie, 2015).

## **Problem Identification**

As patients are enrolled in HHAs across the U.S., many are found upon admission to have blood glucose levels outside of acceptable ranges. Patients are commonly referred to agencies to have a specific comorbid condition managed under the direction of a specialist; subsequently, blood glucose monitoring and other diabetes-related interventions may not

consistently be included in a plan of care (POC). This notion is compounded by challenges that the homebound population has accessing traditional primary care due to frailty and functional limitations; thus, people who are homebound often obtain their care through emergency department (ED) visits and hospitalizations (Leff et al., 2015).

The project site, a Medicare-certified HHA located in Illinois, is no exception to national diabetes concerns. Over the last decade the agency experienced a notable increase, from 10% to approximately 29%, of enrolled patients having a known diabetes diagnosis. The agency also had higher than desired ED utilization and rehospitalization rates. Of the patients who received ED services or were rehospitalized, 40.5% were found to have a known diabetes diagnosis.

In addition to higher than desired ED and rehospitalization rates, variations in processes and care delivery were also observed. Although the HHA is a component of a vertically integrated health system, the provision of diabetes care was found to be misaligned and suboptimal in the home health care setting. The HHA did not: (a) define or identify high risk diabetic patients; (b) have primary care consistently engaged in the care of diabetic patients while enrolled in home care; (c) have a formal process to manage care transitions or coordinate care between the hospital and primary care settings; (d) have standardized, evidence-based protocols in place that were used by other parts of the health system for diabetes care management; or (e) have consistent practices for assessments, care planning, and documentation associated with diabetes related activities. In addition, an audit of agency patients with diabetes revealed that only 49.1% of patient records had documented fasting blood glucose (FBG) levels prior to patients transitioning from the agency, and of those that were documented, only 32.1% had documented FBG levels within the 80-130 mg/dl range.

The HHA leadership identified a significant opportunity to improve the diabetes care management performance of the agency. A project leader was identified, and a team was assembled to identify critical gaps in diabetes care and employ mitigating interventions. This article describes the multipronged quality improvement (QI) approach that was used to reduce system care variation and improve the care coordination and management of the diabetic patients served by the agency. The clinical question the team sought to answer was: For diabetic patients, 18-75 years of age, receiving home care services what effect does a cross-continuum, evidence-based diabetic care management program have on the participants' blood glucose levels and the home health agency's ED utilization and rehospitalization rates over a six-week period of time?

### **Available Knowledge**

The literature review revealed that a variety of approaches are in practice globally to optimize diabetes and other chronic disease management and outcomes. Having an integrated health system and multipronged approach for diabetes care management can result in better clinical and utilization outcomes in comparison to singular approaches. Team-based and coordinated care is a common tenet to achieving optimized self-care management.

**Patient-centered medical homes and patient-centered medical neighborhoods.** A patient-centered medical home (PCMH) is model of care that has been rapidly adopted across the U.S. to gain efficiencies, increase access, enhance patient-centeredness, and improve the quality of care rendered (Ackroyd & Wexler, 2014). Derived from the chronic care model (CCM), the PCMH has been found to be better suited, in comparison to traditional primary care models, to provide proactive, chronic disease management (Ackroyd & Wexler, 2014). The core principles of a PCMH include each member having an identified care provider who leads the medical practice team; high level of accessibility to the team; coordinated care and services

across health care organizations and communities; and high quality, safe, holistic care across the life span (American Academy of Family Medicine, American Academy of Pediatrics, American College of Physicians, & American Osteopathic Association, 2007). In a PCMH the utilization of various disciplines is maximized with a team approach and members functioning at the top of their scopes (Agency for Healthcare Research and Quality, 2012). By using this model, health care team members strive to proactively meet each patient's individualized needs, including prevention and wellness, chronic disease management, and social barriers to care.

The term *patient-centered medical neighborhood* (PCMN) was coined to describe the linkage of PCMHs with other health care providers, organizations, and services that may be used to support care delivery and coordination between entities (Mathematica Policy Research et al., 2011; Spatz & Gabbay, 2014). Specialty service lines, home health agencies, nursing homes, and public health services are all examples of medical neighborhood entities that PCMHs partner with to better manage transitions of care. The ADA (2016) recommends that individuals with diabetes receive coordinated, team-based care comprised of a variety of professional disciplines to achieve care goals. This recommendation aligns with the principles supporting the PCMH and PCMN concepts.

The PCMH model has been identified as a best practice for diabetes care management due to the multidisciplinary team approach, higher level of patient accessibility, more advanced information systems, and provision of integrated, coordinated care with other locales and providers (Patient-Centered Primary Care Collaborative, 2011). In addition, the support and care delivery associated with the PCMH has been found to improve glycemic control as well as decrease hospitalizations and emergency service utilization (Bojadziewski & Gabbay, 2011; Pagan & Carlson, 2013; Watts, Lawrence, & Kern, 2011). Effective communication with

community settings such as home care as well as health system integration can influence care management and outcomes (Nam, Chesla, Stotts, Kroon, & Janson, 2011).

**Case management and care coordination.** Embedding case management professionals with primary care clinicians at practice sites, such as PCMHs, can be an effective approach for improving care coordination across care delivery continuums and clinical outcomes associated with glycemic control, lipid levels, and hypertension (Shaw et al., 2014; Watts et al., 2011; Watts & Lucatorto, 2014; Watts & Sood, 2016). Case management can be provided electronically, telephonically, face-to-face in a clinic or home setting, or a combination thereof.

Supplementing traditional office-based approaches with telephonic interventions has become a common, lower cost, tactic to manage care transitions, improve individual behavior and chronic disease management, reduce readmissions, and reduce ED utilization (Constantino, Frey, Hall, & Painter, 2013; Dennis et al., 2013; Harrison et al., 2011; Johnson, Laderman, & Coleman, 2013).

Care coordination staff from primary care practice sites can help connect community agencies to a PCMH to support the PCMN concept. Integrated approaches have also demonstrated to be effective in managing diabetes in community settings with disparate populations. Lee, Palacio, Alexandraki, Stewart, and Mooradian (2011) evaluated the impact that the PCMH model had on hard-to-reach populations with limited access to care. Having a multidisciplinary team approach, improved access and free or low-cost care, electronic tracking mechanisms such as registries, and standardized protocols resulted in significant improvements in glycemic control. Evidence has demonstrated that using standardized nurse-managed protocols or therapeutic algorithms can positively impact the outpatient management of chronic conditions such as diabetes (Ishani et al., 2011; Prentice et al., 2011; Shaw et al., 2014). Programs that have higher frequency of patient contact and can adjust care per protocol are able

to achieve better glycemic control (Pimouguet, Le Goff, Thiébaud, Dartigues, & Helmer, 2011). Individuals living in rural and remote programs can also benefit from diabetes care management programs. Home visiting community nurses, working under the supervision of a general practitioner, have been found to effectively reduce the A1c levels of individuals living those types of locations (Kirby, Moore, McCarron, Perkins, & Lyle, 2015). Findings of a review of twenty-six randomized control trials suggested that short-term readmission reduction, for adults with chronic illness, requires high-intensity interventions such as nurse facilitated care coordination, communication between providers for each location, and home visits within a few days of hospital discharge (Verhaegh et al., 2014).

**Combination interventions.** Hansen, Young, Hinami, Leung, and Williams (2011) evaluated studies of interventions employed to reduce hospitalizations and found that no single intervention alone could be attributed to rehospitalization reduction. Other studies have found that multipronged approaches that use a variety of tactics are more effective than singular activities. White, Carney, Flynn, Marino, and Fields (2014) found that the primary care practices that employed multiple bridging interventions between settings, such as discharge planning, scheduling office visits before hospital discharge, follow-up phone calls, medication reconciliation, well-timed communication with ambulatory providers, physician continuity across care delivery settings, and the provision of discharge instructions, had a greater impact on readmission reduction than those that did not. Similar findings have also been observed in acute settings. Studies have found that bundled approaches, such inpatient diabetes education, combined with care coordination, transitional care management, follow-up phone calls, or home visits can result in better glycemic control and/or reductions in readmissions (Dungan et al.,



2014; Linertova Ba Econ, Garcia-Perez, Vazquez-Diaz, Lorenzo-Riera, & Sarria-Santamera, 2011; Wong, Chow, Chan, & Tam, 2014).

## **Rationale**

A multipronged, QI methodology was deemed the best approach to address the clinical question. The intent of the QI project team was to translate existing, evidence-based processes and knowledge into the home health practice setting to improve outcomes. This project met basic QI criteria: (a) patients were only involved through use of the medical record review, (b) data was reviewed to improve processes, (c) benchmarks and guidelines were used for comparison, (d) immediate feedback was provided throughout the project (Holly, 2014). The specific QI process used was Plan-Do-Study-Act (PDSA). PDSA is a cyclical process that entails constructing a plan (Plan), implementing it (Do), observing and learning from the interventions (Study), and then deciding what actions should be taken (Act) to meet established outcome goals and objectives (Institute for Healthcare Improvement, 2017). Projects commonly go through multiple PDSA cycles until defined goals and objectives are met. The PDSA process is frequently used by the project site and parent health system; subsequently, the process was familiar to those involved in the project. The team leader guided the QI team through the improvement cycle to implement a change process aimed at improving patients' FBG levels prior to transitioning from the agency, and to decrease the overall ED utilization and rehospitalization rates of the home health agency.

In addition to the PDSA model being the approach used by the QI team, the team also ensured that the underpinnings of the CCM were addressed in the planning phase of the PDSA cycle. The leaders of the parent health system had been actively converting system primary practice sites into PCMHs, with recognition that clinical outcomes can be optimized by

integrating and coordinating care delivery throughout the health system continuum and PCMN. Evidence has demonstrated that care delivery redesign that includes core elements of the CCM results in better outcomes for chronic disease management programs, such as diabetes (Baptista et al., 2016; Bodenheimer, Wagner, & Grumbach, 2002; Coleman, Austin, Brach, & Wagner, 2009). The CCM has six interrelated system components that facilitate goal achievement. Care delivery is transformed to a proactive, planned, population-based approach through health system and community integration strategy and structure, enhanced consumer self-management support, as well as optimized clinical information and decision support systems (Coleman et al., 2009; Philis-Tsimikas & Gallo, 2014).

### **Specific Aims**

The aims of the QI project were to increase the percentage of diabetic patients' with stable blood glucose levels prior to transitioning from the HHA, and to reduce the overall ED utilization and rehospitalization rate of the agency. To achieve, the project entailed transforming the daily care of the HHA diabetic patients to a more proactive, planned, and population-based approach that aligns with the CCM philosophies and the rest of the health system. The desired state was for the home health agency to be integrated into the cross-continuum, evidence-based diabetic care management program with other system entities, such as primary care. Care delivery interventions using a coordinated, team approach for chronic disease management have shown to improve health outcomes (Kaufman, Ali, DeFiglio, Craig, & Brenner, 2014).

### **Methods**

#### **Context**

The HHA is part of a comprehensive, vertically integrated health system in Illinois. The agency is Medicare-certified, licensed to provide care in 19 counties, conducts over 35,000 visits

a year, and has an approximate average daily census of 350 patients. Approximately 75% of the agency payer mix is a Medicare product, 15% commercial, 7% Medicaid, and 3% charitable care. Services are delivered 24 hours a day, 365 days a year, in the home environment to recovering, disabled, or chronically ill persons in need of skilled care. The HHA team cares for a variety of populations including those requiring chronic disease management, rehabilitation, post-operative surgical care, wound care, and high tech infusions. Primary referral diagnoses fall into several categories; the most frequent being joint replacement and circulatory system conditions. Other prominent referral diagnoses include a variety of pulmonary conditions, congestive heart failure, wound care, and injury. Diabetes is one of the most common comorbidities of patients enrolled in the HHA. Approximately 29% of the agency patients have known diabetes.

### **Interventions**

The planning phase of the QI project commenced with the formulation of a home care diabetes committee (HCDC). The HCDC project leader was tasked with identifying major system gaps associated with diabetes care management in the home health setting and developing interventions to mitigate them. The mitigating interventions included: (a) expanding the scope of the health system Diabetes Patient Management Protocol and the Treatment of Acute Complications of Diabetes: Hypoglycemia protocol to include home health; (b) identifying high risk home health diabetic patients and integrating the system ambulatory nurse care coordinators (ANCCs) into their care management; (c) managing transitions of care between the hospital, home health, and primary care settings; (d) standardizing assessments, care planning, and documentation of diabetes related activities in the electronic health record (EHR).

In addition to these interventions, the current use of supplemental patient educational materials and diabetes support nurse consultations were also reinforced.

**Staff education and rollout.** Once the workflows were developed a PowerPoint presentation and an online module were created to train applicable staff. The presentation and module provided an overview of the project, goals, workflows, and staff expectations related to diabetes care management. The information was used for both home care and ANCC staff training. The training was also disseminated to applicable staff electronically through e-mail as a reference. Once the project commenced, individualized education was made available as deemed necessary.

Due to all of the HHA locations sharing a common EHR and mobility of staff working across regions, the project was rolled out to all agency locations. An agency supervisor was tasked with providing oversight of all patients with diabetes enrolled in the home health program to ensure that the diabetes protocols were ordered, deficiencies were addressed, and diabetes – related information and interventions were documented. The supervisor was also accountable for providing feedback to applicable home care CMs as practice deficiencies were indicated.

**Summary of process.** When patients with diabetes were admitted to the HHA, the applicable home health case manager (CM) worked with the admitting physician to determine if the system diabetes protocols were appropriate to add to each individual's plan of care. In addition, the CM reviewed each patient's A1c lab and/or blood glucose levels to determine their diabetes risk levels. Patients were deemed high risk if they had at least one of the following: (a) an A1c level greater than or equal to 9, (b) no A1c level checked within the prior 12 months, (c) a pre-meal blood glucose outside of the American Diabetes Association (2016) recommended glycemic control target of 80–130 mg/dl.

If a patient was deemed high risk, the CM sent a referral to the system ANCC team to monitor progress, ensure the primary care team was engaged in care management while enrolled in home care, and assist with care transitions. Approximately 10% of diabetic patients were found to be high risk. Upon receipt of the referral, an ANCC contacted the patient and/or applicable legal caregiver of the patient to confirm his/her interest in participating in care coordination services. If a patient and/or legal caregiver declined services, his/her wishes were respected and noted in the EHR. While patients received care coordination services, an alert banner displayed across the EHR system that was viewable to all care team members. The banner contained basic impressions of the care coordinator as well as his/her contact information. The care coordination impressions could also be viewed by opening up each patient's interdisciplinary care plan. The ANCCs used a mix of standardized scripting and motivational interviewing techniques when conversing with patients. They telephonically discussed any concerns and every patient's POC with the primary home care case manager, and served as a liaison to the patient's primary care team. The POC was reviewed, revised, and communicated to other members of the patient's care team as needed.

Once enrolled in home health, the CM further assessed each patient's diabetes status by completing a standardized diabetes assessment template. The responses received through the assessment process enabled the CM to develop an individualized, patient-centric diabetes POC for each patient. The POC was documented the diabetes documentation template in the EHR.

As high risk diabetic patients transitioned from home health, the ANCCs continued to coordinate care and monitor patient progress based on individual need. The HHA had been sending, for many years, discharge summaries to primary care providers when transitioning from home health; however, the HCDC did not find this to be sufficient communication for high risk

diabetic patients. To mitigate, the ANCCs adopted the use of a diabetes discharge assessment template that was being used by a hospital team when diabetic patients were discharged from the inpatient to the home setting when not receiving home health services. The template was based off of post-acute transition recommendations set forth by the American Diabetes Association (2015). The template has an algorithm design that generates additional questions, based on patient response to prior questions. When the ANCC identified issues, appropriate system resources were contacted to assist with resolution as indicated. In addition, each patient's primary care team provider received an automatic electronic summary of the assessment after completion.

### **Study of the Interventions, Measures, and Analysis**

Having a systematic measurement system enables leaders to determine if efforts are successful or if additional interventions are required (Varkey, Reller, & Resar, 2007). The interventions should be refined with each incremental cycle of improvement until goals are achieved and sustained. Due to limited resources, project timeframe, and timeframe patients are enrolled in home care, system administrative leadership requested that measures be realistic, easily retrievable, and preferably already measured by the agency. The HCDC recommended that the measures assessed be the FBG levels of patients with diabetes prior to transitioning from home health overall agency ED utilization rate without hospitalization, and overall agency rehospitalization within 30 days rate.

**FBG levels.** A retrospective chart review was conducted to assess the FBG levels pre- and post-intervention of applicable home health patients prior to transitioning from the agency. Specifically, the percentage of patients with FBG levels within the 80-130 mg/dl range, prior to transitioning from home health, was assessed. A dedicated assistant abstracted the most recent

patient FBG levels, up to three days from discharge, from the EHR and entered into an Excel spreadsheet. Patients were excluded from the audit if they were outside of the 18-75 age range or were discharged from the agency against medical advice.

**ED utilization without hospitalization and rehospitalization within 30 days.** The overall agency ED utilization without hospitalization as well as rehospitalization within 30 days data was collected pre- and post-intervention using a reporting feature from a national web-based data analytics and benchmarking program. The program is specific to home health agencies and automatically pulls data from the agency EHR system. The data for both measures are displayed in 12-month run graphs. The program also transmits the data to the Centers for Medicare and Medicaid Services for public reporting purposes.

### **Ethical Considerations**

Ethical concerns must be considered for all patient care and services rendered. Although this QI initiative did not require institutional review board approval, the health care community has an important responsibility to protect people; subsequently, the core concepts of beneficence, autonomy, and justice were preserved throughout the QI project. Patients enrolled in home health programs may be considered a vulnerable population; they are commonly older aged and dependent on nurses and other adults, such as family members, to provide their basic care needs. All HHA employees were expected to uphold the system ethical standards that address the rights associated with patient decision making, privacy, and confidentiality. All applicable patients were provided the opportunity, ongoing, to decline or accept participation with care and services on a voluntary basis. Processes were established to safeguard anonymity and confidentiality. Participants were de-identified by name and replaced by a number. The project data was encrypted within a password protected computer system.

## Results

### FBG Levels

The pre-intervention audit results revealed that the HHA had deficient documentation of FBG levels for diabetic patients; only 49.1% of records had a documented FBG prior to patient transitioning from the HHA. Of those that were documented, 32.1% patients had a documented FBG level within the target range. The initial PDSA cycle goals were to improve documentation of FBG levels, and to have 50% of patients within the 80-130 mg/dl FBG range prior to patients transitioning from the HHA. This goal aligned with existing knowledge that 50% of patients enrolled in home health programs across the country are discharged without meeting evidence-based criteria for controlled blood glucose levels (Dalton, Garvey, & Samia, 2006). The post-intervention audit revealed a marked improvement in documentation, with 73.2% of diabetic patients having a documented FBG level prior to their agency transition (see Figure 1).

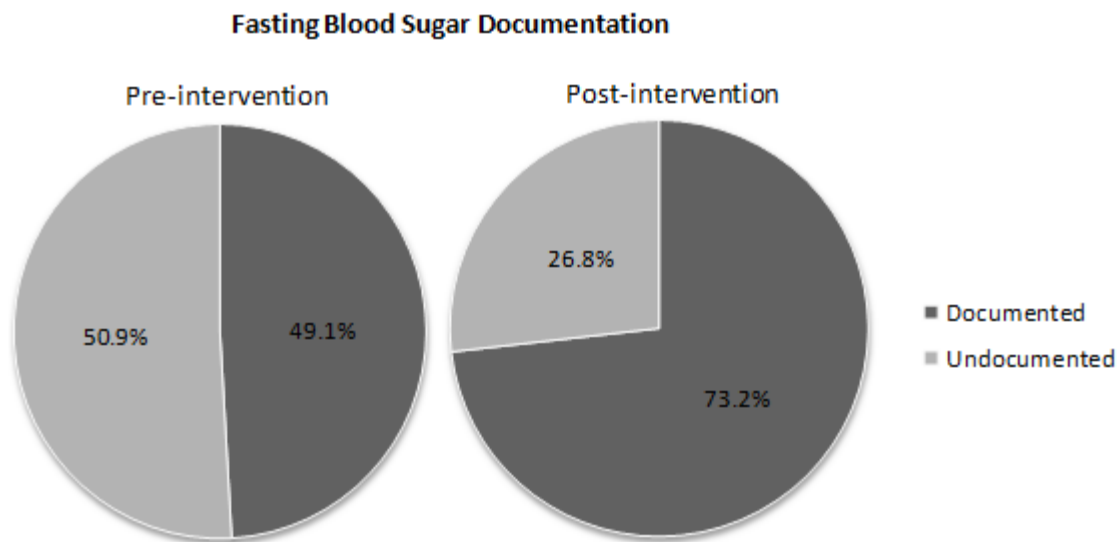


Figure 1. Pre- and post-intervention percentage of patients, with type 2 diabetes, whose fasting blood sugars were documented within three days of transitioning from the home health agency.



Of those that were documented, 41.5% had a documented FBG within the 80-130 range (see Figure 2). Although this did not meet the 50% goal, of the patients who had documented FBGs prior to transitioning from home health, this translates to a 29% increase in patients who transitioned within the target range.

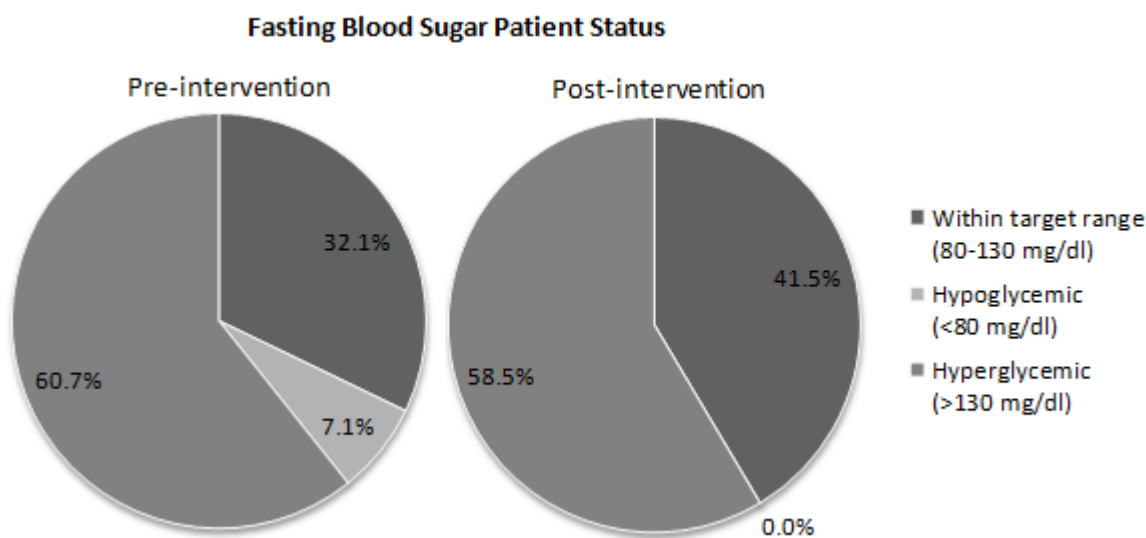


Figure 2. Pre- and post-intervention fasting blood glucose (FBG) status of patients, with type 2 diabetes, who had a documented FBG level within three days of transitioning from the home health agency.

### ED Utilization without Hospitalization

The pre-intervention data revealed that the HHA had an overall ED utilization without hospitalization rate of 6.0%, exceeding both the Illinois (3.6%) and national (3.9%) rates. No percentile ranking was available for this measure. The goal for the initial PDSA cycle was to reduce, by 10%, the overall ED utilization rate from 6.0% to 5.4%. Post-intervention the agency achieved a 5.1% overall ED utilization rate for November, 2016; this was a 15.0% reduction from baseline. The rate was 5.3% for 4<sup>th</sup> quarter, 2016, and 4.3% for 1<sup>st</sup> quarter, 2017 (see Figure 3).

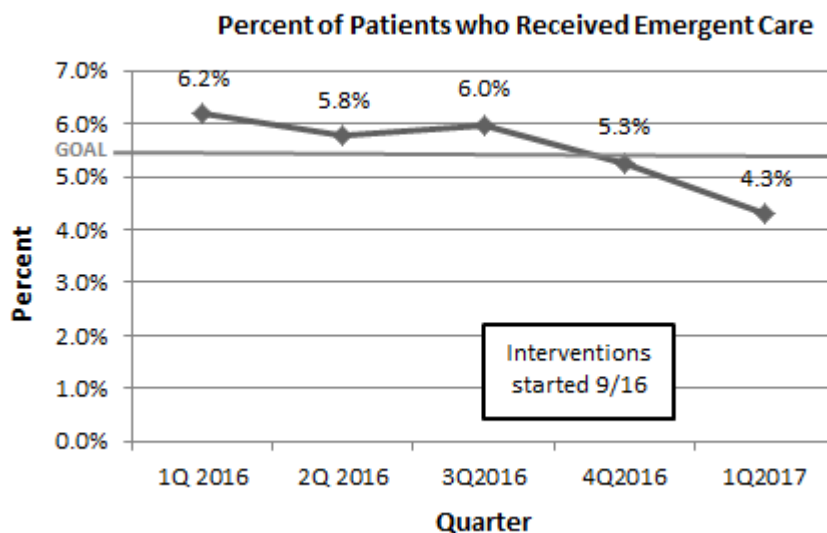


Figure 3. Percent of all patients enrolled in the home health agency who received emergent care without hospitalization.

### Rehospitalization within 30 Days

The pre-intervention data revealed that the HHA had an overall rehospitalization within 30 day rate of 10.4%, placing the agency in the 60<sup>th</sup> percentile. The pre-intervention rate was already lower than both the Illinois (10.6%) and national (11.4%) rates; however, the long-term goal of the parent system is be a top decile performer. The initial PDSA cycle was to reduce the rehospitalization within 30 day rate to 9.4%; an approximate 10% reduction. Post-intervention the rehospitalization within 30 days rate was 10.6% for November, 2016; subsequently, the HHA did not meet the established goal. The rehospitalization rate was 12.7% 4<sup>th</sup> quarter, 2016, and 12.2% 1<sup>st</sup> quarter, 2017 (see Figure 4).

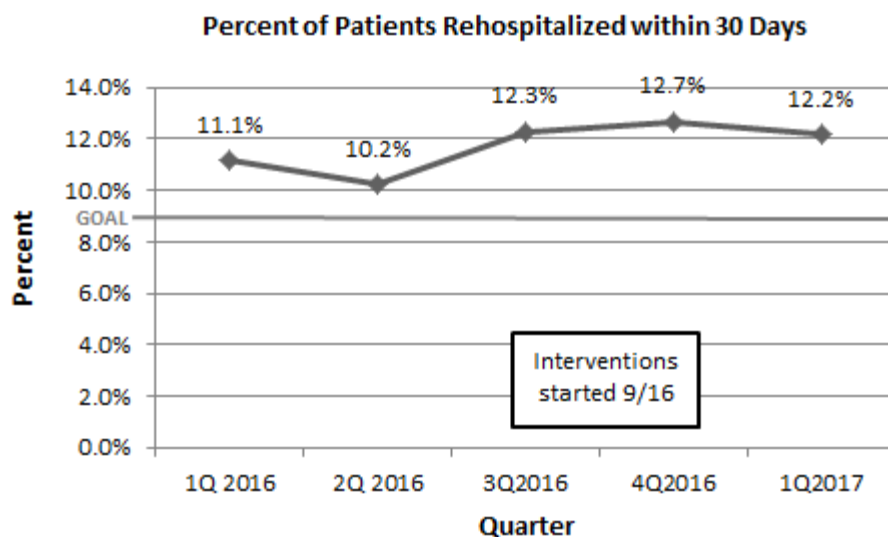


Figure 4. Percent of all patients enrolled in the home health agency who were rehospitalized within 30 days of their hospital stay.

## Discussion

### Summary and Interpretation

The initial clinical question the HCDC team sought to answer was: For diabetic patients, 18-75 years of age, receiving home health services what effect does a cross-continuum, evidence-based diabetic care management program have on the participants' blood glucose levels and the home health agency's ED utilization and rehospitalization rates over a six-week period of time? Due to substantive missing data, this question cannot be sufficiently answered. The primary strength of this QI project was the development of an evidence-based infrastructure that standardized the care management of patients with diabetes. In relation to clinical question, the initial PDSA six-week cycle was not sufficient in resolving documentation issues; thus, impacted the analysis of FBG levels prior to discharge. During the improvement cycle, the documentation of FBGs prior to patients transitioning from the agency increased from 49.1% to 73.2%. Although there was significant documentation improvement, 26.8% of EHRs were still missing

FBG data. Of the FBG levels that were documented, the preliminary results do suggest that the newly employed care management infrastructure may be influencing better glycemic control and associated reduced ED utilization. The pre-intervention data showed 32.1% had FBG levels in the target range, 7.1% had hypoglycemia, and 60.7% had hyperglycemia. Post-intervention data improved with 41.5% of patients having FBG levels in the target range, none with hypoglycemia, and 58.5% with hyperglycemia. Additional PDSA cycles will need to ensue to mitigate the documentation gaps, and enable more in-depth analysis to be conducted. The rehospitalization rates did not appear to be influenced with the multipronged QI interventions.

### **Limitations**

This project had a number of important limitations that should be brought to attention. The primary limitations were the short timeframe in which it was implemented as well as the short timeframe that patients receive HHA services. The timeframe also limited the amount of comparative data that could be generated. Home health patients usually receive services for less than 60 days; the length of the episode of care typically approved by payers for services. Although the system uses a common EHR platform, some module barriers prevented key information from automatically flowing between the home health and ambulatory realms. The agency also experienced a change in leadership that may have impacted FBG documentation compliance. Although documentation did notably improve, the significance of FBG levels was impacted due to incomplete records.

### **Conclusions**

The limitations encountered during this project were real and happen every day in HHAs. These unplanned events should not deter home health leaders from pursuing improvement efforts. A multipronged approach was taken to develop an evidenced-base care management

infrastructure for this particular HHA to reduce variation and improve the care rendered to its diabetic population. Quality improvement is about building upon small, incremental changes. Although missing data prevented in-depth analysis from occurring, the agency leaders have assumed oversight of this QI project, have continued with additional PDSA cycles of improvement, and will continue to refine approaches until goals are achieved and sustained. In addition, this project has paved the way for the evidence-based care management of other chronic diseases and conditions.

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