



The Interdisciplinary Approach to the Implementation of

A Diabetes Home Care DISEASE MANAGEMENT PROGRAM

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Diabetes is a national epidemic and a leading cause of hospitalizations in the United States. Home care agencies need to be able to provide effective Diabetes Disease Management to help prevent avoidable hospitalizations and assist patients to live a good quality of life. This article describes one organization's journey toward providing patients with better diabetes care resulting in an improved quality of life.

Diabetes Mellitus: The Enormity of the Epidemic

Diabetes affects nearly 26 million people of all ages (Centers for Disease Control and Prevention [CDC], 2011). Nearly 10% of the entire U.S. population has diabetes, including more than 25% of seniors (CDC, 2011). An estimated 79 million American adults have prediabetes, of which 50% are 65 years and older (CDC, 2011). As many as one in three American adults are projected to have diabetes in 2050 if present trends continue (CDC, 2011).

Diabetes contributes to direct and indirect healthcare costs, morbidity, and mortality. It is the leading cause of kidney failure, nontraumatic lower-limb amputations, and new cases of blindness among adults in the United States (American Diabetes Association [ADA], 2011). Diabetes is a major cause of heart disease and stroke, and is the seventh leading cause of death in the United States (ADA, 2011). Diabetes kills more Americans every year than AIDS and breast cancer combined (ADA, 2011).

Fostering Self-Management

In the United States, approximately 5% of the population with diagnosed diabetes has been diagnosed with Type 1 diabetes; approximately 90% to 95% has been diagnosed with Type 2 diabetes (ADA, 2011). Effective diabetes self-management is dependent upon a person's current lifestyle and may require the person to make a few to numerous behavioral changes for success. The American Association of Diabetes Educators (AADE) is a multidisciplinary association empowering healthcare professionals to deliver exceptional diabetes care. Effective disease management requires collaboration of an interdisciplinary team, a focus on prevention, patient and caregiver self-empowerment, psychosocial support, and use of evidence-based best practices. Active listening skills are an essential skill for home care clinicians. Active listening is a structured form of listening and responding that focuses the attention on the speaker so that the listener can gain knowledge about the speaker's goals and

readiness to change (Huffman, 2009).

Chronic illnesses are largely self-managed with approximately 99% of the care becoming the responsibility of patients and those involved in the daily

management of their illnesses. Although the responsibility for outcomes, such as metabolic control and chronic complications, is shared with the healthcare team, the daily patient decisions and behaviors clearly have a strong influence on their future health and well-being (Funnell, 2010). Magee et al. (2011) identified in the African-American population, community health disease management leads to improved clinical outcomes. The goal of Disease Management is to empower the patient with the skills to drive his or her own healthcare management. It is only through effective positive behavior change that improvement in clinical outcomes can be seen.

Development and Implementation of a Disease Management Program for Diabetes Mellitus

In this model, Disease Management begins in the hospital and continues along the continuum of care and back into the community. However, patients oftentimes may not feel well in the hospital and so learning is difficult in a crisis situation. "Survival skills" for diabetes are commonly the focus of education while a person is in the hospital. It is therefore imperative that patients have access to community-based disease management programs to transition successfully once back at home. Fortunately, providing care in the patient's home gives the team an important perspective about patients and their support system. The home milieu provides a great opportunity to teach diabetes management right from the central hub of day-to-day life and tailor plans to what the patients feel addresses their needs.

Development of a diabetes-specific home care disease management program was initiated in 2011 and took 2 years to complete. It was implemented in multiple home healthcare agencies under the umbrella of a major home care network. These agencies are inclusive of certified home health agencies, a licensed agency, and an infusion home care. The Home Care Network is part of a nonprofit healthcare system that serves more than 7 million



The seven self-care behavior framework from the American Association of Diabetes Educators are (a) healthy eating, (b) being active, (c) monitoring, (d) taking medication, (e) problem solving, (f) reducing risks, and (g) healthy coping.

(Huffman, 2005). When patients have a recent exacerbation of their disease process, or are newly diagnosed with diabetes mellitus, they may be more receptive to learning. Therefore, every patient hospitalized for diabetes, or a diabetes-related complication, should be referred to a community or home care disease management program. In addition, a large portion of the home care population constitutes an older, very

people. Diabetes programs were implemented throughout the health system. A diabetes taskforce was developed to prevent avoidable hospitalizations and render quality care to the growing population in need of diabetes-related home healthcare services. The diabetes taskforce consists of members throughout the healthcare system, and they ensure best practices for diabetes care. Home care joined the taskforce and worked along this continuum of care to offer the highest standard of diabetes care in the community.

Learning About the Seven Self-Care Behaviors for Success

The seven self-care behavior framework from the AADE are (a) healthy eating, (b) being active, (c) monitoring, (d) taking medication, (e) problem solving, (f) reducing risks, and (g) healthy coping (AADE, 2013). The Diabetes Home Care Disease Management Program was designed to be culturally competent and age-specific while providing individualized patient education directed toward self-management. The overall goals of the program are to prevent disease progression, complications, and hospitalizations and provide patients with a better quality of life. The Home Care Network has a Heart Failure Disease Management Program that has shown to decrease hospitalizations and improve quality care since implemented in 1999. The structure of the diabetes program was modeled after this program while using the AADE-7 Framework.

Timeliness is a key component of care operations (Chabanuk, 2012). The timely start of a diabetes disease management program is an important predictor of patient self-management success. People who self-manage their chronic diseases can prevent or delay disability, and many disease management efforts have shown promising results

sick, and vulnerable group of patients often with several comorbid conditions to manage (King & Galuppo, 2011).

Interdisciplinary Model

Following the AADE7 framework, care is delivered across the continuum from hospital to community to optimize transitional care.

A patient manual for diabetes self-management, best-practice guide for nurses, critical elements for diabetes, and PowerPoint presentation for classroom education and discussion were designed and developed by the diabetes home care team to promote a consistent evidence-based approach to home care diabetes disease management. The materials were developed for more than 1.5 years; weekly meetings were held to monitor the development timeline and occurred more frequently toward the end of the project.

The interdisciplinary home healthcare diabetes disease management team consists of the patient, physician, nurse practitioner, educators, registered nurses, therapists, social workers, and home health aides. Also contributing to the work of the team is the system-certified diabetes educator, information technology, and various office staff. Depending on the patients' needs, not all disciplines will service all patients. The visiting nurse makes an initial visit and determines each patient's individual needs. The visiting nurse is involved in assessment, education, and management of care for each patient. This includes medical nutrition therapy, medication management, glucose monitoring, problem solving, and risk reduction. The visiting nurse coordinates the care of the patient. The social workers address psychosocial needs, financial issues, and lifestyle and mental health issues to ensure healthy coping. Therapists assist with rehab, exercise,

orthotics, and adaptive devices as necessary to ensure appropriate activity and self-care. Home care therapists, along with nurses, are involved in the prevention and management of foot ulcers.

Role of Social Work in the Diabetes Program Development and Implementation

Social work (SW) is one of the disciplines covered in a 60-day home care episode as identified by the Centers for Medicare & Medicaid Services (CMS). The SW role in diabetes disease management focuses on the psychosocial needs of the patient. Psychosocial interventions can support a patient's ability to manage their physical and emotional health. It is well documented that when care is provided without an understanding of a patient's psychosocial profile, outcomes are poorer (Hunt et al., 2012). When patients feel clinicians do not understand their struggle to manage their care, it increases their sense of hopelessness and despair. Being aware of and understanding the impact of a person's belief regarding his or her specific disease and the associated treatments, such as medication adherence, may lead to improved outcomes (King & Galuppo, 2011).

Because both social support and social problem solving are related to higher levels of self-confidence, enhancing social support and social problem-solving skills may be important components of diabetes self-management interventions (Hunt et al., 2012). At times SW will bring patient concerns to the team. The SW will clarify these concerns and questions with the team. For example, a patient may not be able to afford or access medications. The SW will develop strategies to access financial resources with the patient and team to address this.

Dealing With Mental Health/Depression in Diabetes Mellitus

Learning to live with diabetes is a complicated lifelong journey. The reality of having a serious chronic illness that affects major organs can be terrifying. Persistent anxiety, distress, and depression are common. As part of their role in home care, SW may provide mental health and cognitive screenings of patients to identify depression, and cognitive and memory problems such as dementia and Alzheimer disease.

Metabolic changes caused by diabetes increases the risk for depression. Depressed patients have been shown to have poorer glycemic

control and a higher incidence of disease-related complications (Aikens, 2012). Depression affects the ability to care for oneself, monitor glucose, eat healthy, and take medication (Weinger, 2007). SW may provide support and encouragement to patients to seek assistance with mental/cognitive issues as part of the plan of care. Discussion includes treatment options and any assistance needed to implement a plan.

Lifestyle Changes

Optimizing health for patients with diabetes may involve important lifestyle changes. Most difficult can be changing one's diet (Peyrot & Rubin, 2007). Practical problems include understanding diet restrictions, food shopping, meal preparation, and food costs. A disruption in the patient's personal relationship with food and ethnic identity can cause stress for the patient and family. Navigating change involves problem solving and use of coping skills. SW intervention can guide a change process. It may involve a family meeting to provide education, answer questions, and share important resources. Using a collaborative problem-solving approach has other benefits such as startup of a support system, reduction in stress, stabilization of care, and achievement of clinical goals.

Role of Therapy in the Diabetes Program Development and Implementation

Being active is one of the components of the AADE7 self-management behaviors. Physical therapists (PTs) play a primary role in educating patients in the importance of exercise. PTs are also a covered discipline in a 60-day home care episode (CMS). In addition to regulating blood glucose (BG) levels, exercise increases the efficiency of insulin (Teixeira-Lemos et al., 2011). Exercise is a useful adjunct to the control of diabetes because it can reduce body fat, lower blood pressure, increase weight loss, and improve lipid profile. Initiation of an exercise program needs to include the monitoring of BG levels before, after, and, at times, during exercise. Because exercise affects the amount of medication needed and caloric requirement, the team management approach is of utmost importance. The physician, nurses, therapists, and social workers need to be informed of the patient's increased activity level and its potential adverse impact on BG stability, medication need, and dietary management.

The “exercise prescription” or in other words, the frequency, intensity, time, and type of activity can have a major impact on diabetes disease management. The best method of exercise is one the patient will perform on a routine basis (Hall, 2008). Unfortunately, if exercise is performed incorrectly, it can lead to poor control of BG, dehydration, and an increased risk of nerve injury. It is therefore imperative that the physician and PT work in conjunction to devise the optimum aerobic conditioning program of correct intensity and type based on individual evaluation. Some patients may have limited ability to exercise secondary to comorbidities. It is still important that these patients maintain a consistent maximal activity level within their range of ability. For patients who have difficulty exercising, active range of motion activities with the upper and lower extremities, with minimal weight bearing may be recommended (Hall, 2008).

PTs also play an important role in patient education for the prevention of diabetes-related foot ulcers. Patients are informed and instructed regarding their sensory deficits and how to accommodate by using principles of skin care and routine skin inspection. The construction of the shoe should match the patient’s foot shape to ensure optimal fit. Patients are taught to perform a daily foot check using mirrors particularly following lower extremity weight-bearing activities. If warranted, patients may be given recommendations for follow-up evaluations with podiatrists/orthotics for specialty footwear or orthotics. Orthotic devices can contribute to unloading pressure of metatarsal heads (Mueller et al., 2006).

Occupational therapists (OTs) can address physical, cognitive, and sensory deficits. Patients with limited ability to exercise and decreased endurance are referred to an OT to assess and train in energy conservation and work simplification. The OT will elicit self-management behaviors by having patients describe the hardest and easiest activities. The OT may also instruct patients in how to organize medications, use low-vision devices to draw up and measure insulin, use adaptive/talking glucose meters, and incorporate protective techniques for peripheral sensory losses.

Clinician Education

Clinicians need to be empowered with the knowledge and skills needed to care for patients with diabetes. To meet this need and support the program, a 6-hour class is provided for all home care clinicians.

The 6-hour class agenda comprises:

- pathophysiology of diabetes;
- complications of diabetes; and
 - management of diabetes, specifically:
 - disease management,
 - the AADE7 self-care behaviors,
 - medical nutrition therapy,
 - medication management, and
 - patient and clinician tools.

The class is interactive with mandatory participation in assignments, demonstrations, and case studies. There is a focus on physical, family, and environmental assessment. Assessment skills are critical for clinicians because it is only with skillful and accurate assessments that appropriate planning and interventions can be implemented. There is also an emphasis on problem solving, meal planning, glucose monitoring, and managing medications.

Each clinician participant is given:

- An outline of the course with objectives.
- A PowerPoint presentation.
- A diabetes guide consisting of best practices for hypoglycemia, sick days, glucose monitoring, insulin administration, screenings, blood tests, foot care, and exercise. This guide can easily be carried by clinicians and is uploaded to the clinician’s computer.
- A form called “Critical Elements for Diabetes.” This form is reviewed each visit to cue the clinician into asking the questions critical to the care of diabetes, along with the appropriate interventions.

Teach back and a pre- and posttest is given during the 6 hour classes for the clinicians to ensure clinician understanding of the material. Class participants, through teach back, demonstrate and verbalize skills taught in the class. This also gives clinicians practice to do the same with patients. Education is provided to other disciplines as well including social workers, therapists, and home health aides.

In addition, an area in the clinician’s note was developed to meet the standard of care for diabetes mellitus. In the computerized note, if a patient does not have diabetes, the clinician clicks “N/A,” and the area grays out (e.g., no completion needed). See Table 1 for what the clinician needs to know.

Patient Education

Patient education material is often not written from the patient's perspective and not easy to understand. A lack of proper education increases nonadherence or a lack of self-care. (See Table 2.)

The patient education material developed for this diabetes management program is evidence-based and from the patients' perspective. The program is logically organized to follow the 7 AADE self-care behaviors. The appearance of the text in the educational materials is important and affects readability. The font size used is at least a 14-point font (National Institutes of Health, National Institute on Aging, 2008). Serif font is used as it is usually easier to read. Serif makes the individual letters more distinctive and easier for the brain to recognize (CDC, 2009). Paragraph size is limited to small groups of text, making a large amount of information manageable. There is a considerable amount of white space showing, making the material less dense. Use of all upper case letters is avoided as the reading cues provided by word shapes are lost when using all upper case letters (Mayer & Villaire, 2009). Headings are placed so there is more spacing above the heading than between the heading and the related text that follows it. Illustrations are used to aid in learning and retention and are placed as close to the text as possible. The text is left justified.

The content of the material and how it is phrased is important so that the reader will understand, remember and act on the message. Simple language and short words are used. The range of the material is approximately on a 5th to 6th grade reading level. The material went to a system health literacy committee for evaluation and approval. Important information is written first to engage the reader. Pages are designed so the material is easy to read. The number of messages is limited to 3 or 4 main ideas per topic. Bulleted lists replace long sentences. Desired actions are clearly stated using active voice. Actions are written in the positive. The benefits of the desired behavior are emphasized (Mayer & Villaire, 2009). Meaningful headings help the readers select content that is relevant to their need.

Case Scenarios Demonstrating How the Program Shows Improved Clinical Outcomes

Each case scenario will illustrate an example of how a patient might be handled without employing best practices. Then an illustration will be

Table 1. What Clinicians Need to Know

■ Standards of care for diabetes
■ AADE Self-Care Behaviors <ul style="list-style-type: none">○ Healthy eating<ul style="list-style-type: none">• Meal planning• Carbohydrate consistent meal plans• The Plate Method○ Being active○ Monitoring<ul style="list-style-type: none">• Correct use and care of meters• Frequency• Making decisions based on results○ Taking medications<ul style="list-style-type: none">• Insulin administration• Use of syringes and pens
■ Problem solving
■ Healthy coping
■ Reducing risks <ul style="list-style-type: none">○ Prevention and treatment of hypoglycemia, hyperglycemia, complications○ Rule of 15 for treatment of hypoglycemia○ Sick day management
■ Complications of diabetes
■ ADA standards of care <ul style="list-style-type: none">○ Every visit<ul style="list-style-type: none">• Review BG• Blood pressure• Weight• Foot exam• Physical activity• Glucose monitoring review○ Every 3–6 months<ul style="list-style-type: none">• Hemoglobin A1C• Dental exam○ Annual<ul style="list-style-type: none">• Kidney and liver function tests• Urinalysis for microalbumin level dilated eye exam• Comprehensive foot exam• Flu vaccine
■ Excellent assessment skills
■ Ability to assess and intervene for nonadherence (lack of self-care)
■ Interdisciplinary case management

Note. A1C = glycosylated hemoglobin; AADE = American Association of Diabetes Educators; ADA = American Diabetes Association; BG = blood glucose.

given on how the same scenario is handled after program implementation.

Case scenario: A 78-year-old patient is hospitalized for hypoglycemia three times in the last 6 months. The patient is on a Sulfonylurea. The patient forgets to eat regular meals.

Post program: The clinician has the knowledge that a Sulfonylurea can cause hypoglycemia and can be a dangerous medication in an older adult who forgets to eat regular meals. She collaborates with the physician on possible medication change. She also collaborates with the daughter who will call patient and remind patient to eat.

Case scenario: An 82-year-old patient was put on Lantus insulin 24 units every evening. The clinician instructs the patient to dial the pen and administer the insulin. The insulin dose is slowly increased over the next few days until the BG is regulated.

Post program: The clinician teaches the patient to prime the pen with 2 units of insulin after placing the needle on the pen, and counting to 10 after the insulin is injected and before the needle is removed. This ensures the pen is working, dispels any air, and ensures accurate insulin administration without leak back. There is extra insulin placed in each pen so that patients can prime the pen with each injection. Before the program, patient was not getting the full dose because the patient did not prime or count to 10 post injection. Postprogram, patient received the correct dose of insulin and the dosage did not have to be increased.

Case scenario: A patient is on home care for 3 weeks. The visiting nurse has instructed the

patient on foot care; however, the patient still gets a foot ulcer.

Post program: The clinician assesses the patient's shoes and instructs the patient to shake his shoes out before putting the shoes on. The patient shakes a rock out of the shoe. No foot ulcer develops. The clinician further instructs on proper foot care.

Case scenario: A patient has diabetes, Type 2 and congestive heart failure. The patient is on Glyburide and coreg. The patient is hospitalized with hypoglycemia because the beta-blocker masked the signs of hypoglycemia. The clinician is surprised because instructions on the signs of hypoglycemia and the actions to take were given.

Post program: The clinician collaborates with the physician to order glucose monitoring. The patient's BG is low and medications are adjusted. This clinician knows that a beta-blocker can mask the signs and symptoms of hypoglycemia.

Case scenario: A patient is nonadherent with nutritional guidelines. The clinician tells the patient how bad this is and that the patient has to eat smaller portions. On subsequent visits, the BG is normal in the logbook; however, the patient is hospitalized with hyperglycemia. The patient wrote glucose levels in the logbook that would please the clinician.

Post program: The clinician delivered patient-centered care and created an atmosphere that the glucose readings were information, not bad or good. It was just information to guide the care and keep the patient safe. This patient felt comfortable about writing high levels in the logbook, and was motivated to make behavior changes.

Case scenario: An elderly woman refuses many home care nursing visits. The patient often gets angry at the nurse and the nurse comes less often. The patient is hospitalized.

Post program: The nurse is aware of the high incidence of depression with chronic illnesses and refers the patient to SW. Short-term counseling is done and patient is more receptive to the nurse's visits.

Case scenario: An 84-year-old patient is alert and appears to be managing her diabetes but is hospitalized with hyperglycemia. She had difficulty with BG and insulin management.

Post program: The visiting nurse along with the OT screened for adaptive devices to foster management. Patient is able to manage BG monitoring and insulin administration.

Table 2. How to Empower Patients and Caregivers

■ Create an environment that builds rapport
■ Collaborate with the patient and family
■ Put the patient and family in the center
■ Allow the care to be patient driven
■ Assess what the patient and/or family knows
■ Use teaching tools that are patient centered
■ Allow for a "teach back"
■ Take culture into consideration
■ Give psychosocial support

Case scenario: A 72-year-old patient keeps getting hospitalized for hyperglycemia. The patient verbalized how to give the insulin and how to rotate sites.

Post program: The clinician asked to look at these sites and found the abdomen had hypertrophied tissue and the patient was injecting into these sites where the insulin was not absorbed well. The clinician instructed on alternate sites and had patient demonstrate administration.

Case scenario: The clinician instructs a patient with diabetes to have smaller servings to lower BG. The clinician is not comfortable teaching nutrition therapy. This patient is hospitalized with hyperglycemia.

Post program: The clinician along with a dietitian is able to teach the patient a carbohydrate consistent diet following the plate method. This patient is successful in managing the diabetes.

Case scenario: The clinician walks in on a patient that is showing signs of hypoglycemia. The clinician checks the capillary BG that reads 64. The clinician gives the patient a candy bar that is nearby and rechecks in 10 minutes. The BG is 60, and 911 is called.

Post program: The clinician follows the American Diabetes Association (ADA) rule of 15 and instructs the patient to drink a 1/2 glass of fruit juice and rechecks in 15 minutes. The clinician gave 15 g of carbohydrates and rechecked the BG every 15 minutes until the BG was above 80 without symptoms. The clinician then notified the endocrinologist. This patient was not hospitalized.

Case scenario: A 78-year-old patient was ill and not eating. The clinician instructed the patient not to take insulin. This patient was hospitalized with hyperglycemia.

Post program: The clinician instructed the patient to take insulin, and drink caloric liquids equal to the grams of carbohydrates prescribed in a day, and check BG every 4 hours. This patient was not hospitalized. When a patient is ill, there are hormones secreted that will increase glucose.

Summary of Findings

Nurses and other home care clinicians verbalize an increase in confidence in caring for patients with diabetes. The more confident and knowledgeable the staff is, the more likely they are to empower patients. Although not all clinicians pass the pretest, 100% of clinicians pass a posttest.

The hospitals verbalize confidence referring patients to the home care disease management



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program. Patients and families verbalize satisfaction in the care they receive. Home care may not be able to change everything, but sometimes even a small change will make a significant difference in clinical outcomes.

Future Implications

A performance improvement project will be developed to measure outcomes. Changes will be made according to outcome results and analysis of findings. Ongoing education will be given and feedback obtained from patients and clinicians will guide any changes to the classes, tools, or educational material. New or updated information will also be provided. Patient charts will be reviewed and any hospitalizations will be analyzed to see if there were any avoidable causes. Two members of the home care team, a nurse practitioner and an educator will be working toward diabetes certification. ■

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