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## Practice Matters: Prevention and Care of Individuals with Type 2 Diabetes

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A Faith Community Nurse (FCN) is tasked with promoting health within a faith-based community. This is accomplished by providing care that encompasses the spiritual, mental, physical, and social well-being of each individual. As with any nursing role, the FCN must keep abreast of current issues and be aware of informational resources to keep his/her practice relevant. FCNs must be up to date on screening and treatment of common illnesses such as type 2 diabetes. The World Health Organization (WHO) and National Institute of Health (NIH) provide periodic updates on type 2 diabetes which are highlighted in this article. Not surprisingly, the incidence of type 2 diabetes is increasing in adults and children and it is estimated that diabetes will be in the top ten causes of death globally by 2030 (World Health Organization, 2014).

It is interesting to note that FCNs are already working on combatting this problem within the communities in which they serve. These providers are working on equipping people of all ages, genders, and ethnic groups with educational programs to fight obesity since it is a known precursor to many cases of type 2 diabetes. Project TEACH –Transforming, Empowering, and Affecting Congregation Health is a nutrition and exercise program used in a population of African American women (Cooper, King, & Sarpong, 2015). I Choose Health (Elijo Salud) is another interventional program aimed at preventing obesity in Hispanic youth (Oakley & Hoebeke, 2014). Still other programs like Defy Diabetes! (Sheehan et al., 2013) and the Diabetes Prevention Program (Williams et al., 2013) are impacting communities through teaching Healthy Living classes, which include exercise, nutrition, and behavior modifications.

FCNs can play a vital role in type 2 diabetes prevention and management. This article is designed to give the FCN a brief but current overview of diabetes and to include websites where additional resources can be located.

### **Epidemiology**

During 2014, the global prevalence of diabetes among adults was estimated at 9% (WHO, 2014). Diabetes-related deaths worldwide were estimated at 1.5 million in 2012 (WHO, 2014). By the year 2030, the WHO predicts that diabetes will be the seventh leading cause of death (Mathers & Loncar, 2006). In a comprehensive report, the WHO also found that most deaths occur in low- and middle-income countries (WHO, 2014).

In the United States, The National Diabetes Statistics report conducted by the Centers for Disease Control (CDC) in 2014 notes that 29.1 million people (9.3%) have diabetes. Of those, 8.1 million (27.8%) are undiagnosed. This disease

is most prominent in people between the ages of 45 to 64 years of age (24.6 million) and in certain ethnic groups such as Hispanics (12.8 %), Blacks (13.2 %), and American Indians/Alaska Natives (15.9 %). It affects men and women at about the same rate. Approximately 208,000 (0.25%) under the age of 20 are diagnosed with either type 1 or type 2 diabetes. White children/adolescents have the highest rate of new cases of type 1 diabetes while the highest rates of new cases of type 2 diabetes are associated with adolescents aged 10 to 19 years and minority populations (CDC, 2014).

### **Pathophysiology**

Normal glucose metabolism is controlled by two hormones produced by the pancreas: insulin and glucagon. Insulin is secreted at a basal rate and as a bolus when hyperglycemia occurs after the ingestion of food. Insulin allows blood glucose to enter cells to be stored for future use or to be used immediately as an energy source. Without insulin, cells become starved and the symptoms of hyperglycemia become apparent. There are two types of diabetes. Type 1 diabetes is a result of an autoimmune reaction where beta cells in the pancreas are destroyed. Common manifestations are excessive urination, thirst, and hunger. This type of diabetes requires replacement of insulin for survival (Huether, 2000).

The other type of diabetes is type 2 which is more common and most often associated with aging, abdominal obesity, and sedentary behavior. Type 2 diabetes begins insidiously for up to ten years before symptoms become noticeable. Cells become resistant to the action of insulin which means that glucose is not able to enter cells. The end result is sustained hyperglycemia. The pancreas initially responds to insulin resistance of cells by secreting more and more insulin; however, the beta cells eventually wear out. Manifestations of this form of diabetes are recurrent skin infections and delayed wound healing, visual changes, and fatigue. Prediabetes and type 2 diabetes are traditionally treated with oral antihyperglycemics until insulin production wanes to a level where it must be replaced with injectable insulins. Untreated or poorly controlled type 1 and type 2 diabetes results in neuropathies, retinopathy, nephropathy, coronary artery disease, stroke, peripheral vascular disease, and infection (Huether, 2000; National Library of Medicine, 2015).

### **Risk Factors**

There are numerous risk factors for type 2 diabetes including both modifiable and non-modifiable. Non-modifiable risk factors include a hereditary history, age greater than 45 years, and history of gestational diabetes. In addition, some races

have an increased risk factor (American Heart Association [AHA], 2015). Those individuals of African-American, Asian-American, Latino/Hispanic-American, Native American and Pacific Islander descents have a higher risk of developing type 2 diabetes (AHA, 2015). Modifiable risk factors are those that can be altered to prevent type 2 diabetes. These include physical inactivity, weight greater than ideal body weight, hypertension, stress, smoking and abnormal cholesterol levels including low LDL and high triglyceride levels (AHA, 2015).

### Blood Glucose – Criteria for Diagnosis

The diagnosis of diabetes can be made based on plasma glucose or Hemoglobin A1C (A1C) criteria. The same tests are used to screen as well as diagnose individuals. These tests will also identify patients with prediabetes. See Table 1 for specific criteria. A1C offers several advantages over a fasting blood glucose such as greater convenience (fasting is not required) and less day to day variabilities. A fasting blood glucose however, does have the advantage of decreased cost and greater availability (Cefula, 2015).

Table 1 <i>Criteria for Diabetes Diagnosis</i>
A1C $\geq$ 6.5% *
Fasting Blood Glucose $\geq$ 126 mg/dl* (fasting defined as no caloric intake for > 8 hours)
Random Blood Glucose $\geq$ 200 mg/dl (with symptoms of hyperglycemia)*
*A single abnormal result is not indicative of a diagnosis of diabetes.

(Cefula, 2015)

A1C reflects the average blood glucose over 3 months. Routine monitoring determines if individual glycemic goals are being met. Correlation between A1C and mean blood glucose levels have been found. Levels of 7% or less have been shown to decrease microvascular complications associated with elevated blood glucose (Cefula, 2015). See Table 2 for A1C conversions.

Table 2 <i>Diabetes Control Chart</i>										
		Excellent			Good			Poor		
A1C		4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0
	13.0 14.0									
Average Blood Glucose		50	80	115	150	180	215	250	280	315
	350 380									

(Cefula, 2015)

### Blood Glucose Testing and Monitoring

Glucose monitoring assist patients with elevated blood glucose to manage their disease and decrease complications. Monitoring allows individuals to make decisions on medication administration, type and amount of foods to consume, and level of exercise intensity. The most common method to assess blood glucose at home is with glucometers. Timing of blood glucose assessments are captured in Table 3. Testing frequency is more important when insulin is used to manage hyperglycemia (Cefula 2015). The FCN can assist individuals in managing their diabetes by educating them on use of their specific diabetic monitoring device, procedures for analyzing the blood glucose, the importance of documenting the obtained readings, and interpretation of blood glucose levels and required action.

Table 3 <i>Insulin and Glucose Monitoring</i>
<u>Encourage patients that are receiving insulin to check blood glucose:</u>
Prior to meals and with snacks
At bedtime
Prior to exercise
When there are concerns for hypoglycemia
After treating a low glucose until glucose normalizes

(Cefula, 2015)

### Lifestyle Recommendations

Healthy lifestyle changes are recommended for both the prevention and treatment of type 2 diabetes. Weight loss can reduce the risk of developing type 2 diabetes by up to 50% (CDC, 2015). Being active is highly recommended for a patient with elevated blood glucose or for someone trying to prevent this disease. Being active not only assists in weight loss, but helps to manage blood glucose levels, stress and blood pressure (American Association of Diabetes Educators, [AADE],

2015). Another recommendation from the AADE is for patients with hyperglycemia to manage their stress through faith-based activities or through meditation (2015). Monitoring blood glucose is also very important. A patient should monitor per recommendations of their healthcare provider and when feeling ill. Keeping a record of these blood glucose levels can assist the patient and the healthcare provider in better management of their diabetes. Healthy eating is another important part of managing diabetes. Eating at regularly scheduled times and adhering to individualized caloric intake with decreased carbohydrates and increased vegetables can help achieve normalized blood glucose ranges (AADE, 2015).

### **Patient Education Resources**

The worldwide web contains many accurate and up to date resources for faith community nurses and their patients. The CDC has partnered with the National Diabetes Prevention Program to offer educational programming that can be implemented in a faith community setting (CDC, 2015). The NIH and AADE also offers education resources in English and Spanish. CDC, NIH and AADE provides current information free of charge. Refer to Table 4 for these websites.

Table 4 <i>Website Resources</i>
<a href="http://www.cdc.gov/diabetes/prevention/stat-toolkit.html">http://www.cdc.gov/diabetes/prevention/stat-toolkit.html</a>
<a href="https://www.nlm.nih.gov/medlineplus/diabetes.html">https://www.nlm.nih.gov/medlineplus/diabetes.html</a>
<a href="https://www.diabeteseducator.org/patient-resources/aade7-self-care-behaviors">https://www.diabeteseducator.org/patient-resources/aade7-self-care-behaviors</a>

### **Conclusion**

Prediabetes and type 2 diabetes affect many people globally. It is important for FCNs to be able to teach others about the disease process, how to check blood glucose, and why adherence to the medication regimen is important. Furthermore, the patient should understand other actions they can take for a healthier life by eating well and exercising regularly. All of these measures may delay the progression of the disease which has devastating consequences. FCNs can play a vital role in promoting health and supporting those with the disease within their faith community.

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