



# North Carolina's Guide to Diabetes Prevention and Management

# 2020

Diabetes Prevention,  
Diagnosis and Management



North Carolina Diabetes Advisory Council

MANAGE WEIGHT | LIVE TOBACCO FREE | PARTICIPATE IN LIFESTYLE CHANGE PROGRAMS  
PARTICIPATE IN DIABETES EDUCATION | ADHERE TO TREATMENT PLAN | GET ADEQUATE SLEEP





# North Carolina's Guide to Diabetes Prevention and Management 2020

## Introduction

In 2020, nearly one-half of North Carolinians have diabetes (12.5% of the population<sup>1</sup>) or are at high risk for developing diabetes (34.5% of adults have prediabetes<sup>2</sup>). It is also projected that over 3,000 people will die directly or indirectly because of diabetes and its complications, ranking North Carolina as 7th in the nation for diabetes related deaths.<sup>3</sup>

Diabetes is a complex disease and daily self-management can be challenging. Uncontrolled diabetes is associated with serious complications (e.g., heart disease, hypertension, stroke, vision loss, kidney failure, nerve damage, depression, and hearing loss), which negatively impact quality of life for persons with diabetes. In addition to the substantial personal burden of diabetes to those who have it, and the families who also are touched by caregiving, there are substantial financial burdens to individuals, employers, health systems, and communities across the state including multiple levels of government. The annual healthcare cost of diabetes in North Carolina is estimated to surpass \$17 billion by 2025.<sup>4</sup>

In addressing diabetes as a complex disease and the challenges of reducing its burdens, NC must consider personal and environmental factors at individual, relationship, community, and societal levels. Our behaviors as individuals shape and are shaped by our social, economic, and policy environment. Together these terms are often grouped and referred to as the Social Determinants of Health (SDoH). In addition to caring for those who already have diabetes, preventing diabetes and related complications, if not delaying onset of the disease, is important at the individual, community, and systems level.



**North Carolina Diabetes Advisory Council**

This Guide is organized around four levels of social and environmental concepts described by the Centers for Disease Control and Prevention (CDC) and the Socio-Ecological Model of Health (SEM) (Figure 1).

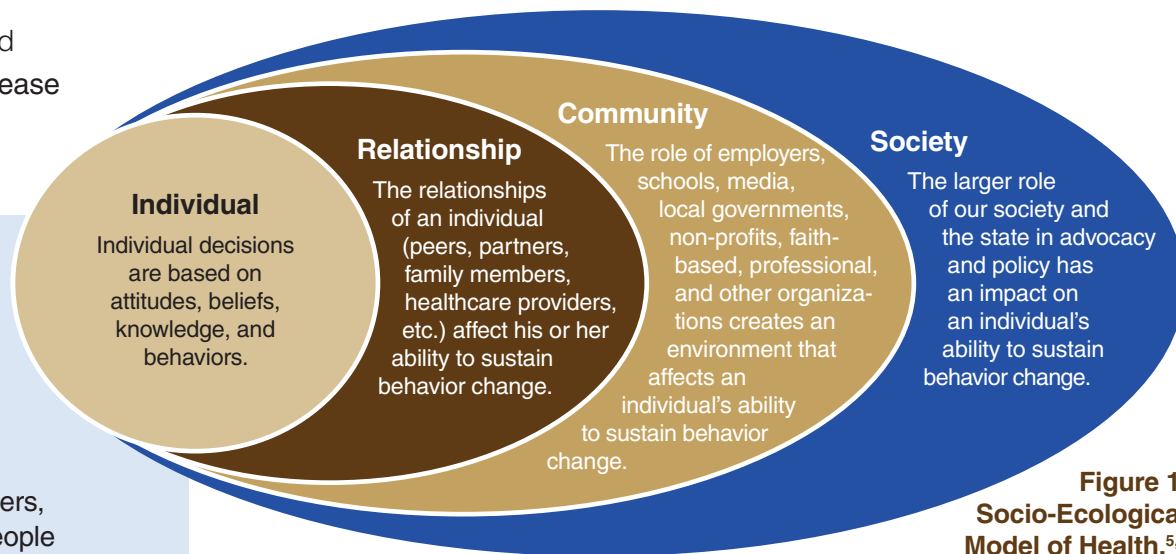
### The Guide:

1. Addresses what diabetes is and what diabetes looks like in North Carolina.
2. Focuses on actions that individuals at risk for diabetes or who have diabetes, families, and peers can implement to improve the health of North Carolinians.
3. Provides specific strategies for community groups, employers, and healthcare providers to implement toward assisting people to manage their risk for developing and/or managing diabetes, including reducing risk of complications.
4. Shares opportunities to focus on what we can do in our various communities to reduce the burden of diabetes, and the evolving role for our broader society including policy and advocacy in North Carolina.

**Statistics Used in this Guide:** Throughout this Guide, we have made every effort to cite the most recent statistics available at the time of going to press.

The Guide's mission is to reduce the burden of diabetes in North Carolina. The **North Carolina Diabetes Advisory Council (NC DAC)** hopes that the information presented in the Guide will increase understanding of the impact of diabetes in North Carolina for our audience (or readers), and what we as individuals, families, and our communities across the state can do to reduce these burdens.

This Guide is also a **Call to Action** to prevent and manage diabetes. After reading it, we hope you will join the NC DAC in our mission to make a difference.



**Figure 1.**  
**Socio-Ecological Model of Health.**<sup>5,6</sup>

## Modeling the Language of Diabetes

Words matter in diabetes care and management. Persons diagnosed with prediabetes or diabetes communicate and engage with their healthcare team, families, friends, employers, communities, etc., in order to successfully manage their diabetes. Language is the tool that makes effective communication possible and supports the person with diabetes on this journey. All language should be person centric. Words that promote inclusion, respect, positivity, and acceptance without judgment fosters collaboration between persons with or at risk for diabetes and their healthcare team.

Throughout this guide we will model language that enhances written and spoken communication when discussing diabetes. We have added the research recommendations from the joint task force of the American Diabetes Association (ADA) and the Association of Diabetes Care and Education Specialists (ADCES) that addresses language best practices in the delivery of diabetes care and diabetes self-care management education and support (DSMES).<sup>7</sup>



# How Can Diabetes Be Prevented or Delayed?

This section describes how to prevent diabetes from occurring or dramatically delaying it (primary prevention), including special considerations for those at high risk who should aggressively work on reducing their risk, and also be monitored for early onset of diabetes through early detection or screening. In the following section we will address the management of diabetes in persons already diagnosed and strategies to prevent complications through individual and group self-management programs and the importance of persistence with prescribed medical therapy (tertiary prevention).

Primary prevention in Type 1 diabetes remains a topic of intensive research, but few recommendations have emerged on how to prevent this form of diabetes. However, several long-term population studies and clinical trials show that most occurrences of Type 2 diabetes can indeed be prevented or delayed.

While the North Carolina Diabetes Advisory Council supports efforts to find a cure for Type 1 diabetes, a major focus of this Guide and the Diabetes Advisory Council is on Type 2 diabetes because it is more common and is potentially preventable. For the remainder of this document, the use of the word “diabetes” will be referring to Type 2 diabetes unless indicated otherwise.

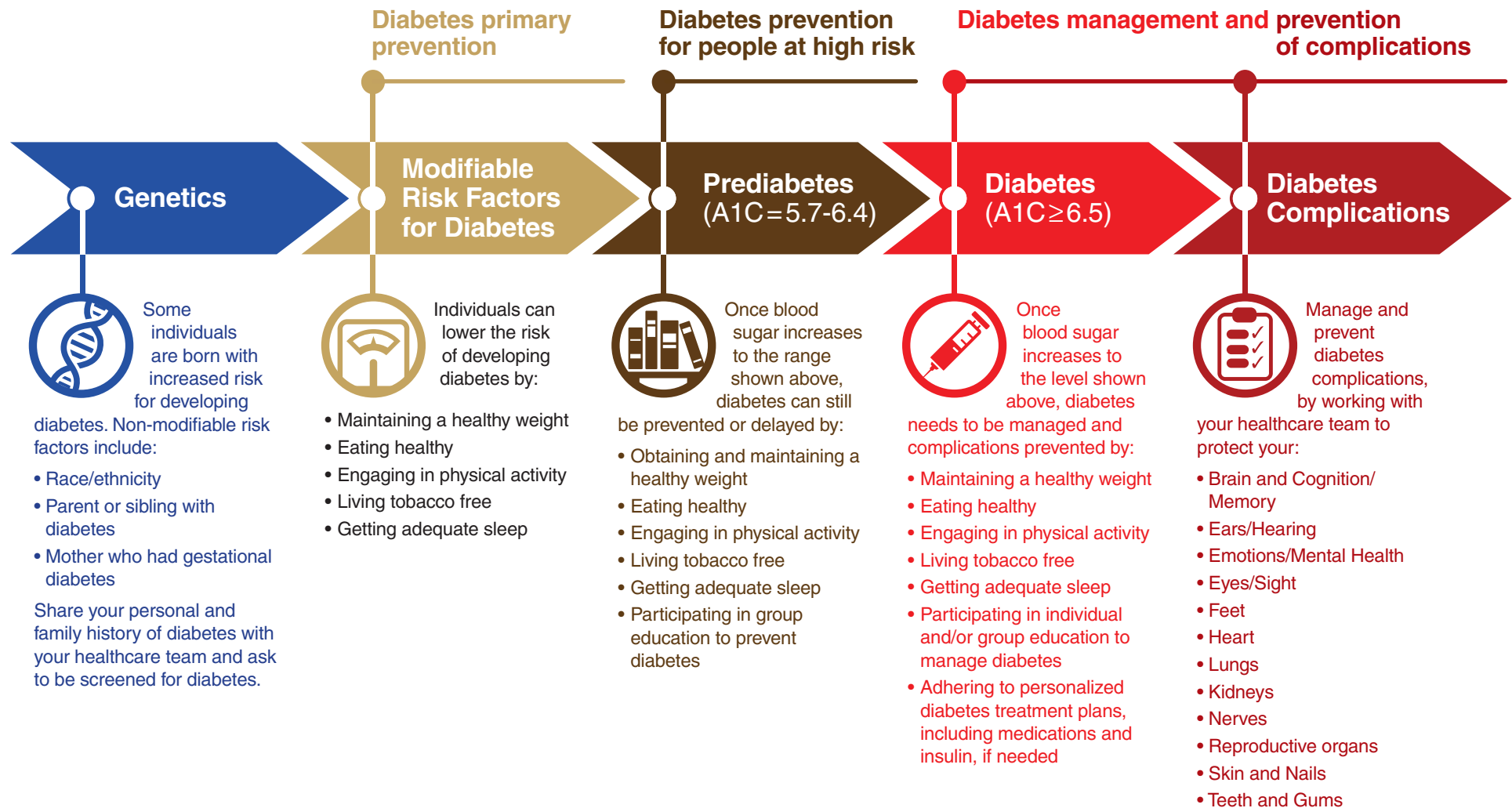
**Figure 2 shows the progression of diabetes and what individuals can do to prevent and manage diabetes at each stage.**



FIGURE 2.

## Lifetime Risk Management for Developing and Managing Type 2 Diabetes

The risk of developing diabetes increases with age.





# Diabetes Primary Prevention

Type 2 diabetes is the most common form of diabetes and can indeed be prevented if not delayed—sometimes for many years—by paying attention to the following healthy behaviors:

**Maintain a healthy weight | Adopt healthy eating habits | Be more physically active | Live tobacco free | Get adequate sleep**



## Maintain a Healthy Weight

According to *North Carolina's Plan to Address Overweight and Obesity*, developed by Eat Smart, Move More NC, excess weight can be caused by calorie intake that is greater than energy used, a sedentary lifestyle, and insufficient sleep and stress. Being overweight increases

the chances of developing Type 2 diabetes by eight times.<sup>40</sup> On the other hand, for people who are overweight, losing 5 to 7% of their current weight can cut their chances of developing Type 2 diabetes in half.<sup>41</sup> Effective weight loss programs are those that assist in the implementation of lifestyle changes such as adopting healthy eating habits, being more physically active, getting adequate sleep, managing stress, living tobacco free, and learning how to change behaviors.

## Adopt Healthy Eating

Healthy eating can have a major impact on lowering the risk for prediabetes and Type 2 diabetes. There are a variety of healthy eating patterns which can be tailored to each person that incorporate their favorite foods, traditions, and cultural preferences as well as address

concerns related to religion or socioeconomic factors. Eating patterns represent the total of all foods and beverages consumed in a day.

A registered dietitian nutritionist (RD/RDN) can provide valuable information about how to eat healthy with prediabetes or diabetes, based on the individual's needs, goals, medications, food patterns, and preferences.<sup>42, 43</sup> In this process, the person with prediabetes or diabetes and the dietitian collaborate to design a healthy meal plan which can be integrated into daily life with ease while addressing their specific eating pattern and nutritional needs. All persons with prediabetes or diabetes should be referred to a RDN initially and ongoing to establish their healthy eating meal plan and then modify as needed.<sup>42, 43</sup> There is no single “best” meal plan for people with prediabetes and diabetes; rather a variety for managing prediabetes and diabetes are acceptable. In terms of evidence-based research regarding the comparative benefits of different eating patterns, the outcome data presently is not strong enough to endorse one eating pattern over another.



**Examples of some eating patterns**

- Mediterranean Style
- DASH (Dietary Approaches to Stopping Hypertension)
- Vegetarian or Vegan
- Low Fat
- Low-Carbohydrate
- Diabetes Plate Method



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### Focus on the key factors that are common among the eating patterns:<sup>43</sup>

- Food is comprised of three main nutrients that supply energy to the body—carbohydrates, proteins, and fats. All three should be incorporated into each meal in balance, which helps in improving glucose (sugar) and lipid (fat) levels.
- Emphasize non-starchy vegetables, fruits, whole grains, and dairy products.
- Although the Dietary Guidelines for Americans, 2015–2020, recommend fat-free or low-fat dairy products, current research suggests full fat dairy products do not increase the risk for heart disease, stroke, or diabetes. It is reasonable to have 2 to 3 servings per day of either full fat or low-fat non-sweetened dairy products. Individualized nutrition patterns should include foods that lower the risk for chronic diseases, such as fruits, vegetables, healthy fats, and whole grains. Additional information about healthy eating patterns is provided in Table 1.<sup>44, 45, 46</sup>
- Minimize added sugars and refined grains.
- Choose whole foods over highly processed foods to the extent possible.
- Reduce overall carbohydrate intake for individuals with diabetes has the best evidence for improving high blood sugar and may be included in a variety of eating patterns that meet individual needs and preferences.
- Healthy eating also focuses on reducing trans fats, portion control, avoiding added sugars and sodium.
- Alcohol can be used in moderation if not contraindicated due to other medical issues. As alcohol use in diabetes can lead to hypoglycemia, weight gain and hypoglycemia, it is recommended that individuals discuss the risks with their healthcare providers and limit intake to one drink daily for women and two for men.<sup>42, 43</sup>
- Studies show that one serving of a sugar sweetened beverage (SSB) per day increases the risk for Type 2 diabetes in adults with prediabetes by nearly 25%.<sup>47</sup> Dietary patterns that avoid SSB are encouraged, replacing them with water for fluid consumption. Persons with prediabetes or diabetes are encouraged to avoid SSBs although moderate use of natural and artificial sweeteners is acceptable. While non-nutritive sweeteners (NNS) do not appear to have a major effect on glucose management,<sup>48</sup> there is also evidence that they may actually contribute to excess weight gain and diabetes.<sup>49</sup>
- Daily recommended sodium (salt) intake is <2300 mg/day for all adults.
- For those adults with Type 2 diabetes not meeting their blood glucose targets, or where reducing glucose lowering medications is a priority, reducing overall carbohydrate intake with low- or very low-carbohydrate eating plans may be considered in conjunction with ongoing guidance and follow-up by their healthcare team.
- Occasionally persons with diabetes may need to fast for religious reasons or before a medical procedure. Such fasting should be done carefully and with advice from their healthcare provider especially if taking insulin or medications that might lower blood sugar. Research on the risk and benefits of Intermittent Fasting as a dietary pattern in persons with diabetes remains limited and inconclusive. Persons with diabetes should not adopt this pattern without ongoing dialogue, monitoring and management by their diabetes care provider.<sup>50</sup>



**Table 1. Healthy Eating Patterns Include:<sup>51</sup>**

**Fruits, vegetables, whole grains and fat-free or low-fat dairy and dairy products.**

There is convincing evidence that meal plans rich in whole grains decrease risks associated with diabetes. Eating patterns rich in refined grains lead to increased risk.<sup>52</sup>

Strong evidence supports a meal plan high in fruits and vegetables for weight management. They are lower in calories and high in volume and fiber. These foods are efficient because they are low in calorie and make you feel full longer.

Additionally, avoid sugar sweetened beverages (SSB).

**Lean meats, poultry, fish, beans, eggs and nuts.**

There is growing evidence that consumption of red meat (beef, pork, lamb) and processed red meat (bacon, hot dogs, deli meats) increases the risk of diabetes, even among people who consume only small amounts.

**Moderate amounts of saturated fats, sodium and added sugars, and no trans fats.**

The types of fats in your meal plan can impact the development of diabetes. Healthy fats, including polyunsaturated or monounsaturated fats found in liquid vegetable oils, nuts and seeds can help decrease risks associated with prediabetes and Type 2 diabetes.

**Calorie needs to achieve and maintain a healthy weight.**

Maintaining a healthy weight requires keeping the number of calories consumed equal to the number of calories expended. Research shows that portion size influences how many calories a person consumes. Understanding portion sizes is important for individuals to accurately assess the number of calories he/she is consuming. Because oversized portions are common in restaurants, supermarkets and vending machines, it is important to be aware of and practice appropriate portions during meal preparation.<sup>53</sup>





Mobile Apps can be a game changer for people living with or working on preventing diabetes. However, when searching under “Diabetes” in an app store there are thousands of possibilities. In 2019, Ahn and Stahl reported on the pros and cons of apps and how these can be integrated into clinical practice.<sup>54</sup> These apps can help with a variety of self-care behaviors and help the person keep track of their goals, progress, and successes. Each app is unique and each person must be part of the selection process, as with any other diabetes technology, as they are the end user. The apps listed below have proved successful for people with prediabetes or diabetes.



### Nutrition and Fitness

- **MyFitnessPal** (Apple/Android); free with in-app purchases
- **Weight Watchers** (Apple/Android); paid program; virtual DPP
- **Fooducate** (Apple/Android); free with in-app purchases
- **Calorie Mama AI** (Apple/Android); free with in-app purchases
- **Calorieking** (Apple and Android) free
- **Lose It!** (Apple/Android); free with in-app purchases
- **Zombies, Run!** (Apple); free with in-app purchases
- **FitBit** (Apple/Android); free with in-app purchases; requires wearable device

### Management, Monitoring, and Education

- **Tidepool** (Apple/Android); free
- **MySugr** (Apple/Android); free with in-app purchases
- **One Drop** (Apple/Android); free with in-app purchases
- **Livongo** (Apple/Android); through employers
- **Omada Health** (Apple/Android); Virtual DPP and DSMES
- **WellDoc/BlueStar Diabetes** (Apple/Android); Virtual

### Stress Management

- **Calm** (Apple/Android); free with in-app purchases
- **Breathe2Relax** (Apple/Android); free

## RESOURCES FOR HEALTHY EATING

### Association of Diabetes Care and Education Specialists (ADCES)

- [diabeteseducator.org/docs/default-source/living-with-diabetes/tip-sheets/aade7/aade7\\_healthy\\_eating.pdf?sfvrsn=16](https://diabeteseducator.org/docs/default-source/living-with-diabetes/tip-sheets/aade7/aade7_healthy_eating.pdf?sfvrsn=16)
- [diabeteseducator.org/docs/default-source/living-with-diabetes/tip-sheets/aade7/aade7\\_healthy\\_eating\\_sp\\_rev.pdf?sfvrsn=6](https://diabeteseducator.org/docs/default-source/living-with-diabetes/tip-sheets/aade7/aade7_healthy_eating_sp_rev.pdf?sfvrsn=6) (Spanish)

### American Diabetes Association (English and Spanish)

- [diabetes.org/nutrition](https://diabetes.org/nutrition)

### National Diabetes Education Program (English and Spanish and adapted for Chinese, African Americans, Southeastern and South Asian Americans, Filipino Americans, and Korean Americans)

- [cdc.gov/diabetes/ndep/toolkits/choosing-healthy-foods.html](https://cdc.gov/diabetes/ndep/toolkits/choosing-healthy-foods.html)

### Center for Disease Control—Nutrition for Diabetes and Healthy Weight

- [cdc.gov/diabetes/managing/eat-well/meal-plan-method.html](https://cdc.gov/diabetes/managing/eat-well/meal-plan-method.html)
- [cdc.gov/healthyweight](https://cdc.gov/healthyweight) (English)
- [cdc.gov/healthyweight/spanish](https://cdc.gov/healthyweight/spanish)



## Be More Physically Active

Increased physical activity plays a major role in the prevention and improvement of insulin resistance, prediabetes, gestational diabetes, Type 2 diabetes and diabetes-related health complications. Insulin resistance can be present in both those who have obesity and are overweight, as well as those at a healthy weight (lean diabetes mellitus).<sup>55</sup> Aerobic,

resistance training and intentional stretching improve insulin action and can assist with long-term management of blood glucose levels, lipids, blood pressure, cardiovascular risk, mortality and quality of life.

The ADA and the National Academy of Sports Medicine (NASM) recommend at least 150 minutes of moderate intensity, mostly aerobic physical activity, per week, spread over at least three days per week with no more than two consecutive days without exercise. According to the CDC, moderate activity can be assessed using a rating of perceived exertion (**Borg rating**) or how hard one feels they are working based on:

- Increased heart rate.
- Increased sweating.
- Increased respiration or breathing rate.
- Muscle fatigue.<sup>56</sup>

Unless your healthcare provider recommends otherwise, resistance training should also be included at least twice per week, with one or more sets of at least five different resistance training exercises.<sup>8</sup>

Efforts to promote physical activity should focus on developing self-efficacy and fostering social support from family, friends and healthcare providers and working with communities on accessible, affordable physical activity options. Encouraging mild or moderate physical activity may be most beneficial to adoption and maintenance of regular

physical activity participation. Joining a gym or health club might be motivating and enjoyable, but everyone can increase their level of activity and physical fitness at home, including cardio and strength, with minimal resources and equipment.

## Live Tobacco Free

Smoking is a proven risk factor for diabetes, with people who smoke being 30–40% more likely to develop Type 2 diabetes than those who don't smoke.<sup>57</sup> The more someone smokes, the greater the chance of developing diabetes.<sup>58</sup> While smoking can increase the risk of developing diabetes, it can also make diabetes management more difficult. Among those with diabetes, people who smoke are more likely to have problems maintaining proper blood sugar levels and may require larger doses of insulin to manage their blood sugar.

Most importantly, people with diabetes who smoke are at a heightened risk of premature death and morbidity from serious complications such as heart disease and stroke, circulation problems, nerve damage, eye problems leading to blindness and kidney disease.

The American Diabetes Association advises all people not to use cigarettes and other tobacco products or e-cigarettes. In recent years e-cigarettes have gained public awareness and popularity because of perceptions that e-cigarette use is less harmful than regular cigarette smoking. Nicotine can raise blood sugar regardless if delivered by smoking or vaping.<sup>59</sup> However, in light of recent CDC evidence of deaths related to e-cigarette use, no persons should be advised to use e-cigarettes, either as a way to stop smoking tobacco or as a recreational drug.<sup>60</sup>





## Get Adequate Sleep

Sleep is a complex and essential biological process that is required daily for all of us. Learning, memory processing, cellular repair and brain development are among the important functions of sleep.<sup>61</sup> In addition to maintaining normal brain functioning, sleep has important



roles in controlling the functions of many other body systems. Reducing the total hours of sleep can lead to serious consequences for almost all bodily organs and systems.<sup>62</sup>

Getting adequate sleep is important. Sleep deprivation can contribute to the development of glucose intolerance, insulin resistance, diabetes and metabolic syndrome. A distinct rise and fall of blood sugar

levels during sleep appears to be linked to sleep stages. Not sleeping at the right time, not getting enough sleep overall or not getting enough of each stage of sleep disrupts this pattern. For most adults getting seven to eight hours of quality sleep a day is needed to perform adequately, avoid a sleep debt and not have problem sleepiness during the day.<sup>63</sup> Those who work night shifts, or change shifts frequently, are at a higher risk of Type 2 diabetes.<sup>64</sup>

Poor quality sleep may also be associated with overeating and making unhealthy food choices by stimulating hunger signals or suppressing signals of fullness. In turn, overeating especially before going to sleep/going to bed makes it harder to fall asleep or remain asleep.

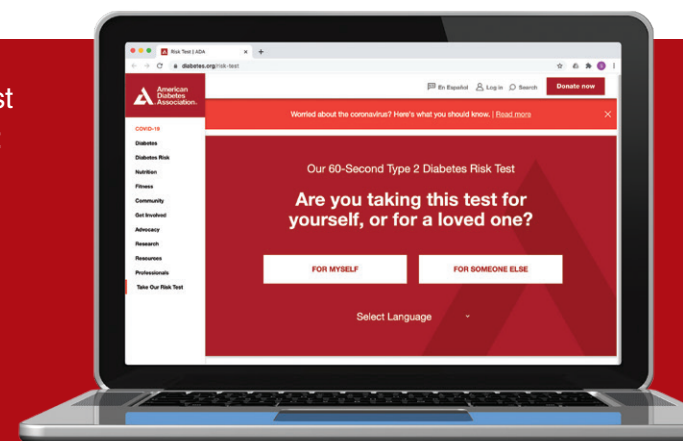
Obstructive sleep apnea (OSA) is a risk factor for cardiovascular disease, and is very common in those with obesity. People with symptoms suggestive of OSA such as excessive daytime sleepiness, snoring, and/or episodes of not breathing while sleeping, should

discuss these symptoms with their medical team. Sleep apnea treatment (lifestyle modification, continuous positive airway pressure, oral appliances, and surgery) significantly improves quality of life and blood pressure management and even the risk of sudden death.<sup>65</sup>

## Risk Factor Identification, Early Detection, and Screening<sup>8</sup>

Individuals at high risk for developing diabetes should seek annual screening to detect diabetes at its earliest stages when lifestyle and medication options might be most effective in preventing further progression or complications. Individuals who have one or more of the following: body mass index (BMI) greater than or equal to 25 kg/m<sup>2</sup>; family history of diabetes; member of certain racial and ethnic groups; or history of gestational diabetes are particularly at risk for developing diabetes.<sup>66</sup> Even without identifiable risk factors, early detection or screening recommendations for Type 2 diabetes suggest that non-pregnant adults 45 years or older be screened, regardless of risk. If screening results are normal, repeat testing should be completed every three years; sooner if adults have any of the risk factors mentioned above or if symptoms of hyperglycemia develop (e.g., excessive urination and thirst, blurred vision, frequent yeast infections, non-healing wounds).

ADA Diabetes Risk Test  
[diabetes.org/risk-test](https://diabetes.org/risk-test)



# Diabetes Prevention for People at High Risk

Some people are at higher risk than others of developing diabetes. In this section we will touch on preventing Type 1 diabetes, prediabetes—which is often considered a precursor to Type 2 diabetes, gestational diabetes that can occur in some pregnant women, and some of the other conditions associated with diabetes or special risks.

## 1

### Preventing Type 1 Diabetes

People at highest risk for **Type 1 diabetes** are those who have a parent, brother, or sister with Type 1 diabetes. While

Type 1 diabetes can develop at any age it most commonly starts in children or young adults. This type of diabetes is thought to be the result of an autoimmune reaction where the body's immune system mistakenly attacks itself. Risk factors for Type 1 diabetes are not as clear as for prediabetes and Type 2 diabetes although Caucasians are more likely to develop Type 1 diabetes than African Americans and Hispanic/Latinx Americans. Currently, no one knows how to prevent Type 1 diabetes.<sup>67</sup>

## pre

## 2

### Preventing Prediabetes or Early Type 2 Diabetes

You're at risk for developing **prediabetes**<sup>21</sup> that can lead into Type 2 diabetes if you:

- Are overweight
- Are 45 years or older
- Have a parent, brother, or sister with Type 2 diabetes
- Are physically active less than 3 times a week
- Have ever had gestational diabetes (diabetes during pregnancy) or given birth to a baby who weighed more than 9 pounds
- Are African American, Hispanic/Latinx American, American Indian, or Alaska Native (some Pacific Islanders and Asian Americans are also at higher risk)

Middle-aged and older adults are at the highest risk for developing Type 2 diabetes,<sup>11</sup> particularly if they have prediabetes, or women who have had gestational diabetes during any of their pregnancies.

Once an individual is diagnosed with prediabetes, the main treatment goal is to delay or prevent progression to Type 2 diabetes primarily through behavioral changes and if indicated, medications. Losing a modest amount of weight (five to seven% of total body weight) through healthy eating and moderate physical activity (such as brisk walking 30 minutes a day, five days a week), within the context of a lifestyle change program, has proven to be effective.<sup>11</sup> Programs like the CDC-led **National Diabetes Prevention Program** can help you make healthy changes that have lasting results. North Carolina has over 75 CDC-recognized Diabetes Prevention Program providers that offer either online or onsite classes. Visit **DiabetesFreeNC** to find a program near you.





## Preventing Gestational Diabetes

You're at risk for developing **gestational diabetes**<sup>14</sup> (diabetes while pregnant) if you:

- Had gestational diabetes during a previous pregnancy
- Have given birth to a baby who weighed more than 9 pounds
- Are overweight
- Are more than 25 years old
- Have a family history of Type 2 diabetes
- Have a hormone disorder called **polycystic ovary syndrome (PCOS)**<sup>69</sup>
- Are African American, Hispanic/Latinx American, American Indian, Alaska Native, Native Hawaiian, or Pacific Islander

Gestational diabetes usually goes away after the baby is born but increases the mother's risk for prediabetes and Type 2 diabetes later in life. Babies born from mothers with gestational diabetes are also more likely to become obese as a child or teen and are also more likely to develop Type 2 diabetes later in life. Before someone gets pregnant, they may be able to prevent gestational diabetes by losing weight if overweight, by eating healthier, and by getting regular **physical activity**.<sup>67, 70</sup>

## Other Conditions Associated with Diabetes

Other conditions can cause the body to gradually become more resistant to working with the insulin it produces causing a higher risk of developing Type 2 diabetes. Here we will touch on only some of the more common conditions associated with diabetes. A constellation of metabolic abnormalities known as the Metabolic Syndrome include high LDL (bad) cholesterol and triglycerides (another lipid) and low HDL (good) cholesterol, elevated blood pressure, excessive body fat especially around the waist, and insulin resistance that can lead to high blood sugar. The Metabolic Syndrome can be one of the most common causes of Prediabetes where resistance to our own insulin gradually increases to the point that we cannot fully metabolize the glucose we take in. If we cannot keep pace with the amount of insulin required to overcome that resistance, our blood sugar levels rise enough until we are diagnosed as having Type 2 diabetes. The good news is the Metabolic Syndrome, Prediabetes and many of the conditions listed below can be managed with diet, exercise and sometimes medications to prevent the onset of complications including diabetes.

Other metabolic states associated with insulin resistance include medical conditions such as Polycystic Ovary Syndrome, Cushing's Syndrome (an excess of cortisol hormones), Acromegaly (growth hormone excess) and liver disorders called nonalcoholic fatty liver disease (NAFLD)/nonalcoholic steatohepatitis (NASH).<sup>71</sup>

NAFLD is characterized by increased fatty deposits in the liver and is present over half of those with Type 2 diabetes.<sup>72</sup> Some individuals with NAFLD further develop an inflammatory reaction that can lead to liver scarring, called NASH, which can further progress to cirrhosis. Because NAFLD/NASH either co-exists with or is just a different way that the underlying metabolic syndrome presents, as our population becomes more obese, these fatty liver disorders become part of the epidemic of Type 2 diabetes across all age groups world-wide. Currently the American Diabetes Association recommends that patients with Type 2 diabetes and elevated liver enzymes or fatty liver on an ultrasound should be evaluated for the presence of NASH and liver fibrosis.<sup>8</sup>

People with other autoimmune diseases such as celiac disease and autoimmune thyroid disease as well as those infected with the hepatitis C virus are also at higher risk of developing diabetes, probably due to additional insults on the pancreas by an overactive immune system reducing the proper output of insulin when needed. Therefore, people with autoimmune diseases should be monitored for developing diabetes through periodic screening.<sup>8</sup>



## Medication Options to Prevent Diabetes among People at High Risk

As previously mentioned, there are currently no known strategies to prevent Type 1 diabetes. Those at high risk for prediabetes or Type 2 diabetes, and who already have underlying medical conditions also known to increase the risk of diabetes such as Polycystic Ovary Syndrome (PCOS), Cushing's disease, Acromegaly, NASH, etc., should seek medical care for adequate management of these disorders including medication and/or surgery as needed.

Persons with prediabetes might also consider medication supplements to reduce obesity in addition to health dietary patterns and exercise. Although not approved by the FDA for the purpose of preventing Type 2 diabetes, several clinical trials suggest that a drug called metformin may be beneficial in preventing progression of prediabetes to Type 2 diabetes.<sup>8</sup>



## Getting Help Through Education and Diabetes Prevention Programs

Healthcare providers, Diabetes Care and Education Specialists, registered dietitian nutritionists (RDN), pharmacists, lifestyle coaches, and other healthcare providers can assist in individual and group diabetes prevention education.

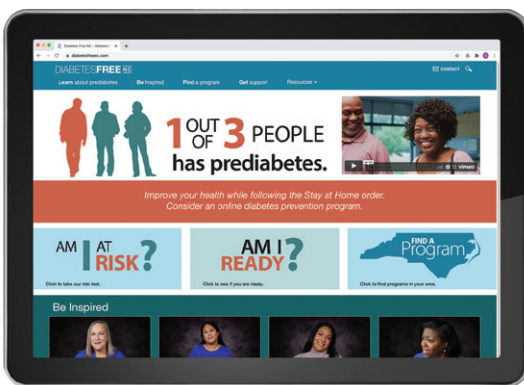
In 2010, The Centers for Disease Control and Prevention (CDC) created The National Diabetes Prevention Program (National DPP) to address prediabetes and Type 2 diabetes prevention through a CDC-recognized lifestyle change program. This yearlong lifestyle change program is evidence-based and helps people who have prediabetes and/or are at risk for Type 2 diabetes make achievable and realistic lifestyle changes and reduce their risk of developing Type 2 diabetes by up to 58%.<sup>7,9</sup> Diabetes Prevention Program (DPP) classes are designed to empower people with prediabetes to take charge of their health and well-being. Participants learn ways to incorporate healthier eating and moderate physical activity, as well as problem-solving, stress-reduction and coping skills into their daily lives. The DPP classes are delivered either in-person or virtually with a trained lifestyle coach for at least 16 sessions in the first 6 months, then at least 6 follow-up sessions in the next 6 months. The CDC recognition assures that DPPs deliver quality and evidence-based support.



## Diabetes Prevention Programs in North Carolina

North Carolina has over 75 CDC-recognized Diabetes Prevention Program providers that offer either online or onsite classes. Diabetes Prevention Programs are offered in varied community locations such as local health departments, YMCAs, community centers, faith-based organizations, hospitals and worksites. In 2016, the North Carolina General Assembly made funding available to the North Carolina Division of Public Health (NC DPH) for the North Carolina Office of Minority Health and Health Disparities (NC OMHHD) to establish and administer an evidenced-based diabetes prevention program targeting African-Americans, Hispanic/Latinx and American Indians (HB 1030, 2015-241, Section 12E.3). The goal of the North Carolina Minority Diabetes Prevention Program (NC MDPP) is to establish a statewide framework to decrease the incidence of diabetes in minority communities. The NC MDPP strives for health equity in all practices and policies, and was created to address the many barriers and challenges that exist within minority communities to seek and receive equitable programs and services.

**NC Prevents Diabetes** is a partnership between NC State University and the NC Division of Public Health with Blue Cross and Blue Shield of North Carolina to offer diabetes prevention programs to all North Carolinians regardless of insurance status. This project is made possible through \$5 million in funding from Blue Cross and Blue Shield of North Carolina. This funding supports both online and onsite programs across the state by covering the program registration fee (current average cost = \$430) as well as providing participant incentives and optional transportation and childcare supports. The goal of the project is to remove the barrier of cost to participate in a diabetes prevention program. Visit **DiabetesFreeNC** to find a program near you.



## Medicare Diabetes Prevention Programs<sup>74</sup>

Medicare's Diabetes Prevention Program expanded model is a structured behavior change intervention that aims to prevent the onset of type 2 diabetes among Medicare beneficiaries with an indication of prediabetes. It differs from other DPPs in that Medicare requires that a diabetes prevention program has received CDC Diabetes Prevention Recognition to be eligible for reimbursement. Check with your local Medicare Office if you have questions.

Medicare Part B (Medical Insurance) covers the costs of a diabetes prevention program once, if all of these conditions apply to you:

- You have prediabetes or are at risk for developing Type 2 diabetes hemoglobin A1C between 5.7 and 6.4%, or fasting plasma glucose of 110–125 mg/dL, or 2-hour plasma glucose of 140–199 mg/dL on an oral glucose tolerance test within 12 months before attending the first core session.
- You have a body mass index (BMI) of 25 or more (BMI of 23 or more if you are Asian).
- You've never been diagnosed with Type 1 or Type 2 diabetes or End-Stage Renal Disease (ESRD).
- You have never before participated in the Medicare Diabetes Prevention Program.

**The program begins with 16 core sessions offered in a group setting over a 6-month period focused on**

- Training to make realistic, lasting behavior changes
- Tips on how to get more physical activity
- Strategies for controlling your weight
- A behavior coach, specially trained to help keep you motivated
- Support from people with similar goals

**Once you complete the core sessions, you are eligible for**

- 6 more months of less intensive monthly follow-up sessions to help you maintain healthy habits
- An additional 12 months of ongoing maintenance sessions if you meet certain weight loss and attendance goals

## Common Terms and Acronyms Used for Diagnosing Prediabetes and Diabetes<sup>75</sup>

**A1C:**  
Hemoglobin A1C

**BMI:**  
Body Mass Index

**FBG:**  
Fasting Blood Glucose

**FPG:**  
Fasting Plasma Glucose

**GDM:**  
Gestational Diabetes Mellitus

**IFG:**  
Impaired Fasting Glucose

**IGT:**  
Impaired Glucose Tolerance

**OGTT:**  
Oral Glucose Tolerance Test

**TIR:**  
Time in Range

# Diagnosing Diabetes

## Recommended Screening Guidelines for Prediabetes and Diabetes

Providers should consider testing in overweight or obese individuals with a BMI  $\geq 25$  kg/m<sup>2</sup>, or 23 kg/m<sup>2</sup> in Asian Americans, with *one or more of the risk factors identified below*.<sup>76</sup>

- First degree relative (parent or sibling) with diabetes
- High risk race/ethnicity (African American, Hispanic/Latinx, Native American, Asian American, or Pacific Islander)
- Age
- History of cardiovascular disease
- Hypertension (BP  $\geq$  to 130/80 mm/Hg /or on therapy for hypertension)
- HDL Cholesterol  $\leq$  35 mg/dl and /or Triglycerides  $\geq$  250 mg/dl
- Women with Polycystic Ovarian Syndrome (PCOS)
- Physical inactivity
- Insulin resistance associated clinical conditions as noted above, acanthosis nigricans, pregnancy, or women who are overweight and currently planning pregnancy.
- A1C  $\geq$  5.7%.

## Frequency of Testing

- Those persons with an A1C  $\geq$  5.7%, or with prediabetes, IGT, or IFG should be tested yearly.
- Women who had Gestational diabetes mellitus (**GDM**) *should be tested 4–6 weeks postpartum and then 1 to 3 years for the remainder of their lives.*
- Otherwise, **testing for diabetes should begin for all individuals beginning at age 45 years.**
  - *If results are normal, those individuals should be tested every 3 years or more frequently based on risk, lab results, diabetes symptoms, and/or change in health status.*



## Diagnosis Criteria

There are several methods that can be used to diagnose both prediabetes and diabetes. These involve blood testing at either a healthcare provider's office or commercial laboratory. **It should be noted that a positive result based on one test alone in the absence of symptomatic hyperglycemia (high blood glucose levels) is insufficient.**

*Diagnosis is best confirmed based on validation by two abnormal test results.<sup>76</sup>*

**Hemoglobin A1C (A1C) is one test used to diagnose prediabetes or diabetes.** This blood test measures the average amount of glucose circulating in the blood stream during the past three-month period. (Hemoglobin is a protein found in red blood cells that carries oxygen in the blood. Glucose adheres to the hemoglobin on these red blood cells; so, by measuring the Hemoglobin A1C, it is possible to know the average % of circulating glucose during this time frame.)

- A1C result in the range of  $\geq 5.7$  to  $6.4\%$  is considered a positive diagnosis for prediabetes.
- A1C result  $\geq 6.5\%$  is considered a positive diagnosis of diabetes.

## Facts about the A1C

- It is possible for persons with prediabetes to lower their A1C value below  $5.7\%$  to halt progression towards the development of diabetes.
- The **A1C** test is also used for people already diagnosed with diabetes to assess hyperglycemia (high blood sugar levels).
- It is recommended that persons with diabetes aim to keep their A1C level below  $6.5\%$  without **hypoglycemia** (low blood sugar levels) with the goal of preventing complications. **It should be noted this goal is individualized for each person** based on age, medications, concomitant health issues, and other factors such as barriers to care, personal issues, and social determinants of health.
- HbA1 can be inaccurate in patients with anemia, iron or b12 deficiency, sickle cell, thalassemia, or blood loss.

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The **fasting plasma glucose (FPG)** can also be referred to as **fasting blood glucose (FBG)** is also used to diagnose prediabetes and diabetes. Fasting is defined as *no caloric intake for at least 8 hours*. This test is most reliable when given in the morning. FBG is one of the most commonly used tests for diagnosing diabetes.

- FPG less than 100 mg/dl fasting is considered normal.
- FPG  $\geq 100$  and  $\leq 125$  mg/dl are diagnostic for prediabetes
- FPG  $\geq 126$  mg/dL is positive for diabetes (when found on more than one occasion)

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The **oral glucose tolerance test (OGTT)** is another method used to diagnose prediabetes, diabetes, and gestational diabetes. This test is usually performed after overnight fasting and measures blood glucose before and two hours after a person drinks a standardized liquid containing 75 grams of glucose dissolved in water. This test is often used for prediabetes screening as it identifies post meal hyperglycemia, which often presents prior to an increase in the fasting glucose level.

- Normal: a blood sugar level at 2 hours of  $\leq 140$  mg/dL
- Prediabetes is diagnosed at a two-hour blood glucose level of 140 to 199 mg/dl,
- Diabetes is diagnosed at two-hour blood glucose level  $\geq 200$  mg/dl.

For persons presenting to a healthcare provider or facility with symptoms of diabetes, or hyperglycemia crisis, a random plasma glucose  $\geq 200$  mg/dL whether fasting or not is also considered diagnostic for diabetes.

# Diabetes Management and Prevention of Complications

For persons with diabetes, the key to managing their illness, blood sugars and preventing complications is following their health provider's clinical recommendations including medication adherence, screening for early signs of complications and adopting healthy behaviors.

## Clinical Considerations

Several excellent guidelines lay out clinical recommendations such as those from the American Diabetes Association Standards of Medical Care in Diabetes.<sup>8</sup>

Scan the QRS code  
([care.diabetesjournals.org/content/43/Supplement\\_1/S37.figures-only](https://care.diabetesjournals.org/content/43/Supplement_1/S37.figures-only))  
for more details from the American Diabetes Association on suggested "Components of the Comprehensive Diabetes Medical Evaluation at Initial, Follow-Up and Annual Visits."<sup>77</sup>



## Time in Range (TIR) and emerging tool for clinical management.

An estimated 30–40% of persons with Type 1 diabetes as well as a growing number of those with insulin requiring Type 2 diabetes use insulin pumps, continuous glucose sensor monitors (CGM), or integrated insulin pump/CGM devices as tools for diabetes management.<sup>78</sup>

Today, the new "hybrid" models of insulin pumps are designed to deliver insulin, integrate glucose monitoring and provide diabetes management software that offers comprehensive data analysis related to both insulin doses and daily life activities. Many of these hybrid insulin pumps are now fully integrated with CGMs; offering the person with diabetes and their healthcare team real-time data to assist in the management of diabetes. Careful review of the comprehensive data provided by these hybrid pumps/CGM integrated systems has unveiled a new metric which can also be used to assess overall glycemic control called **Time in Range (TIR)**.<sup>79</sup>

While A1C can be used to diagnose diabetes, it does not address the constant changes of glucose levels, hypoglycemia, or daily glucose patterns and trends. TIR identifies both the percentage of time and specific time frames where glucose is above or below the individual's recommended target and provides useful information regarding patterns and trends related to food timing, insulin dosing, exercise and daily activity, hypoglycemia, and illness.

TIR is also a more accurate measure than A1C for assessing glycemic control in persons with those conditions where A1C values are less accurate (iron deficiency and other anemias, hemoglobin abnormalities, and pregnancy).<sup>79</sup> A recent retrospective analysis of Diabetes Control and Complication Trial (DCCT)<sup>89</sup> and other studies<sup>80</sup> demonstrated that TIR is strongly





associated with reduced risk of microvascular complications (e.g., retinopathy and microalbuminuria: small amounts of protein in the urine above what is normal and typically an early sign of kidney disease) in persons with Type 1 and Type 2 diabetes when the TIR percent increased. A TIR value of 70% strongly aligns with an A1C of 7,<sup>81, 82</sup> and the clinical recommendation is to keep TIR  $\geq 70\%$  for a minimal of 16 hours/day.<sup>79</sup> In clinical practice, time in range is a useful tool that complements A1C as metrics for both targets and outcomes in optimizing diabetes care and management.

A TIR Tip-Sheet is available.

### TIR targets:

- A target range of 70–180 mg/dL for individuals with Type 1 diabetes and Type 2 diabetes,
- And 63–140 mg/dL during pregnancy, along with a set of targets for the time per day [% of CGM readings or minutes/hrs.].
- Recommendations also outline setting conservative CGM targets for persons with diabetes who are older and/or considered high-risk, with a strong focus on reducing the percentage of time spent in hypoglycemia/hyperglycemia.

## Diabetes Self-Care Management Education and Support (DSMES)—A Critical Tool for Adopting (or Developing) Healthy Self-Care Behaviors

For persons with diabetes, a critical tool for managing blood glucose and preventing complications is successfully practicing the **AADE7 Self-Care Behaviors®** (Figure 3) and incorporating those skills and processes into their everyday routines. These behaviors are healthy eating, being active, monitoring, taking medications, problem solving, reducing risk, and healthy coping. These skills assist people with diabetes in their efforts to manage and stabilize their blood glucose levels within the range recommended by their healthcare team as well as providing recommended clinical preventative measures for overall health

maintenance and risk reduction. Evidence based research demonstrates that managing diabetes by keeping glucose within recommended individual target ranges reduces the risk for complications, slows the progression of the disease and improves health outcomes.<sup>83, 84</sup>

This is best accomplished through a patient centric collaborative team approach that includes the individual's primary and diabetes healthcare providers, diabetes self-care management and support (DSMES) team, specialists if indicated and ongoing support.<sup>85</sup>



**Figure 3. Transformation of the AADE7 Seven Self-Care Behaviors.<sup>85</sup>**



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DSMES provides people affected by diabetes with the critical survival skills and strategies to manage their diabetes as well as ongoing support as they integrate these processes into daily life. Diabetes care and education (also referred to as diabetes self-management education and support or diabetes self-management training, or DSMT), is performed by healthcare professionals who have appropriate credentials and experience within their scope of practice. **DSMES services** are provided by a variety of credentialed professionals such as nurses, registered dietitian nutritionists (RDN), pharmacists, and Certified Diabetes Care and Educational Specialists (CDCES).

## Definitions and Terms used in Diabetes Self-Care Management and Support (DSMES)<sup>75</sup>

**Lifestyle Management** includes: DSMES, DSMT, MNT, physical activity, smoking cessation counseling, psychosocial care.

**DSMES:** Diabetes Self-Management Education and Support

The combination of education (DSME) and support (DSMS). With the inclusion of “support” in the most recent update in the National Standards for DSMES, this is now the preferred terminology

**DSMT:** Diabetes Self-management Training

Term used by the Centers for Medicare and Medicaid Services for DSMES. Preferred term for legislative activity and reimbursement/billing issues.

**MNT:** Medical Nutrition Therapy

**CDCES:** Certified Diabetes Care and Education Specialist

**DCES:** Diabetes Care and Education Specialist

DSMES services are designed to address the person’s health beliefs, cultural needs, current knowledge, physical limitations, emotional concerns, family support, financial status, medical history, health literacy, numeracy, and other factors and barriers that influence each person’s ability to meet the challenges of self-care.<sup>86</sup> These providers can be found in a variety of settings: hospitals, physician offices, clinics, pharmacies, home health, wellness programs, health departments, or communities. The initial DSMES referral is provided by a primary care provider (PCP) to a formal DSMES program. Ongoing support services can be provided within PCP or endocrinology practices as well as in a variety of community-based resources such as rural health centers, health departments, support groups, faith-based programs, payer-based programs, or by community health workers. A flyer (**Thrive with Diabetes**) is available for more information about DSMES services and about when to refer.

Evidence-based research demonstrates that engaging adults with diabetes in DSMES results in statistically significant and clinically meaningful improvements in A1C. The greatest improvements are achieved when DSMES includes both individual and group education, is provided by a team, participants attend more than 10 hours, and is individualized to address each person’s unique needs. Additionally, DSMES is focused on behaviors and engages the person with diabetes in this process.<sup>87</sup>

### When to Refer for DSMES

There are four critical times when DSMES should be provided for Type 2 diabetes (Figure 4):

- At diagnosis
- Annually and when not meeting targets
- When complicating factors occur
- When transitions in care occur

**Figure 4. Four Critical Times for DSMES Services<sup>88</sup>**



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**Table 2. Target Goals for Glucose (Fasting, Pre-meal, Post-meal) and A1C goals<sup>91</sup>**

<b>Fasting glucose before your meal:</b>	80 to 130 mg/dl
<b>Glucose two hours after the start of the meal:</b>	Below 180mg/dl
<b>A1C goal:</b>	< 7 % without frequent hypoglycemia—individualized for each person
<b>A1C goal—adjusted:</b>	< 8% for persons sensitive to hypoglycemia, elderly, history of severe heart disease, long duration of diabetes
<b>Talk with your healthcare team about what blood sugar numbers are right for you.</b>	



These times identified in Figure 4 are critical points when people with diabetes may need assistance to achieve and/or adjust their goals and care plans for successful daily self-management.<sup>89</sup> Because diabetes is a chronic disease that progresses over time, ongoing vigilance and flexibility are necessary to address and adjust changing needs or treatments. Referrals for DSMES may be needed more frequently than just these specific 4 times. Diabetes care and education plans at each of the 4 critical times include individual assessments that focus on the needs and experiences of the person with diabetes relevant to self-management and applicable treatment targets.<sup>90</sup>

## Self-Care Recommendations for Persons with Diabetes

For persons with diabetes, it is recommended to follow-up with your diabetes care team every 3 months to help stay healthy with living with diabetes. During these visits, people with diabetes should expect to have:

- A1C checked and compared to blood sugars from home
- Blood pressure checked
- Blood and/or urine chemistries to assess kidney function, with a referral to a specialist as needed
- Lipid (cholesterol) levels (at least once a year)
- A foot exam (take off those shoes and socks) and importance of daily self-foot exam at home to inspect for changes in skin or temperature, infections, fungus, cracks, fissures, corns or callous, ingrown nails, edema or decreased sensation
- Screening for depression or distress; let your provider know if you are overwhelmed by managing your diabetes, are feeling depressed, or find it challenging to cope
- Screening for tobacco use or vaping
- Reminder to see your dentist two times/year and to brush and floss teeth daily
- Assessment for sleep apnea, with a referral to a specialist as needed
- Referral to an audiologist at the time of diagnosis for hearing evaluation and screening for risk of falls (future evaluations might be required based on the full medical history)
- A review of your individualized, patient-focused plan of care for managing your diabetes
- Referral to an eye care provider at least once a year who can perform a dilated eye exam
- Review of all your immunizations to ensure you are up to date: flu vaccine (yearly), pneumonia vaccines, hepatitis B vaccine, and discuss the need for a Tdap and/or MMR booster, shingles and HPV vaccines with your provider
- Referral to see your DSMES team at the four critical times (e.g., when complicating factors occur) and annual follow-up review.

## Preventing and Reducing Risks for Complications

Diabetes can lead to complications over time particularly when glucose levels remain elevated for extended periods of time and /or there is extreme glucose variability. Diabetes is associated with:

- Macrovascular changes of the large blood vessels which can lead to cardiovascular disease (heart attack, strokes, hypertension), clotting disorders, amputations, hearing loss
- Amputations: diabetes and complications of ulcerations lead to 50–75% of the non-traumatic amputations
- Microvascular changes to the small blood vessels which can impact the eyes (retinopathy), ears (hearing), kidneys, end stage renal disease and dialysis (nephropathy), feet, hands, and nerves (neuropathy)
- Gastroparesis (slower or incomplete emptying of the stomach) and impaired digestion secondary to central autonomic neuropathy
- Peripheral vascular disease (altered or decreased circulation to the feet and legs, edema, nails and skin)
- **Hearing Loss**, deafness (both a microvascular change and neuropathy)
- Periodontal (gum) disease, loss of dentition
- Skin changes (skin tags, oral skin lesions, itching, infections due to bacteria, fungus, or yeast)
- Vision changes or loss, Cataracts and Glaucoma
- Sleep Apnea
- Non-alcoholic Fatty Liver Disease (NAFLD)
- Other Endocrine or autoimmune disorders
- Persons with diabetes are at higher risk for Hepatitis B infection and more frequently develop complications from the flu or pneumonia
- Increased risk of falls from loss of vision, foot neuropathy, and vestibular complications leading to potential fractures and head injury
- Depression and diabetes distress

## Preventing Other Complications

People with prediabetes, Type 1 and Type 2 diabetes are at high risk for developing cardiovascular disease including heart attack and stroke. They should be screened for other cardiovascular risk factors

such as lipid disorders (high total cholesterol, LDL cholesterol and triglycerides), high blood pressure and strongly counseled not to smoke.<sup>8</sup>

Immunizations are important for persons with diabetes as protection from complications of flu, pneumonia, Hepatitis B, Shingles, Tetanus, Pertussis, and Diphtheria. All illnesses and infections in persons with diabetes causes glucose to rise to high levels (hyperglycemia), which in turn increases the difficulty to resolve these illnesses, which is why immunizations are important.<sup>8, 92</sup>

- Annual flu vaccine
- Hepatitis B vaccination for all adults with diabetes who have not previously been vaccinated for Hepatitis B and are younger than 60 years of age.
- Pneumococcal vaccines once as an adult before 65 years of age and then two more doses at 65 years or older
- Shingles vaccine
- Tdap (Tetanus, diphtheria, and pertussis): Initially and then every ten years

For additional information about immunizations and diabetes, visit the Association of Diabetes Care & Education specialists website [here](#) and [here](#).<sup>93, 94</sup>

## The Language of Diabetes

Diabetes is a challenging and complex medical condition that demands intense engagement in the daily management on the part of the person with diabetes. The learning curve is rapid and steep; requiring mastery of multiple critical self-care skills and problem-solving strategies to successfully navigate this condition. Persons with diabetes must also integrate these new responsibilities into their other roles and obligations (spouse, parent, grandparent, manager, employer, employee, community member, household manager, caregiver, teacher, mentor, etc.). Persons *and* families who live with diabetes every day need ongoing support and encouragement from their healthcare teams, community, families, friends, and co-workers.

Language is the primary channel for sharing knowledge and verbalizing understanding.<sup>7</sup> Once heard or read, people transform words into meaning,<sup>95, 96</sup> impacting their self-concept. Language is the center whereby a person determines their identity, social perception,



attitudes, bias, and stereotypes. The use of certain words or phrases can intentionally or unintentionally express bias about personal characteristics (e.g., race, religion, health, or gender).<sup>7</sup> Thus, language shapes the experience for the person with diabetes and impacts both the context and their perception of the information. Studies have demonstrated that the language used in diabetes care and management makes a huge difference in terms of behaviors, outcomes, and motivation.

The Association of Diabetes Care and Education Specialists (ADCES) and the American Diabetes Association (ADA) formed a joint task force focused on language in diabetes care and education. This group reviewed the literature regarding language used in the delivery of diabetes care and education and made recommendations for language that enhances the communication process. Appropriate language should be used by all healthcare professionals and others when discussing diabetes through spoken or written words and can be used with a variety of audiences (people with diabetes, colleagues, or the public).<sup>7</sup>



- Stigma that has historically been attached to a diagnosis of diabetes can contribute to stress and feelings of shame and judgment
- Every member of the healthcare team can serve people with diabetes more effectively through a respectful, inclusive, and person-centered approach
- Empowering language that focuses on the individual's strengths can improve communication and enhance motivation, health, and well-being of people with diabetes.
- Specific themes and associated words should be avoided.

**Words to Avoid**

- **Judgment** (non-compliant, uncontrolled, don't care, should, failure)
- **Fear/Anxiety** (complications, blindness, death, Diabetic Ketoacidosis)
- **Labels/Assumptions** (Diabetic, all persons with diabetes are fat, suffer)
- **Oversimplifications/Directives** (lose weight, you should, you'll get used to it, at least it's not...)
- **Misunderstanding/Misinformation/Disconnected** (cure, reverse, bad kind, you are fine)
- **Body Language and Tone** (no eye contact, accusatory tone)

**BE AWARE AND CHOOSE YOUR WORDS WITH CARE**

**Table 3. List of Problematic Words and Preferred Words to Use.**

Problematic	Preferred
Diabetic	Person living with diabetes
Test blood glucose	Check or Monitor
Control (Verb)	Manage—describe what the person is doing
Control (Noun)	Define what you mean with control and use A1C, blood glucose level
Good/Bad/Poor	Safe/unsafe levels; target levels; use numbers and focus on facts instead of judgmental terms
Compliant/Adherent	Takes medicine about half the time; Eats vegetables a few times a week; describe engagement and participation

Our words and messages are powerful. When our mindset places the person first, the language will follow, removing the labels of shame, guilt, and blame. When we hear language that is negative, speak up and advocate for persons with diabetes while educating those around us.<sup>97</sup> Additional resources can be found at the **Association of Diabetes Care & Education Specialists**.<sup>98</sup>

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North Carolina Diabetes Advisory Council

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PARTICIPATE IN DIABETES EDUCATION | ADHERE TO TREATMENT PLAN | GET ADEQUATE SLEEP