North Carolina's Guide to Diabetes Prevention and Management

What Can Employers Do?



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

AND



North Carolina's Guide to Diabetes Prevention 2020 and Management

Introduction

In 2020, nearly one-half of North Carolinians have diabetes (12.5% of the population¹) or are at high risk for developing diabetes (34.5% of adults have prediabetes²). 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.³

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 2025.⁴ 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.



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.
- 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.



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).⁷

Importance of Social Determinants of Health and Health Equity to Prevent and Manage Diabetes

Traditionally, public health and healthcare agencies have focused on understanding and addressing **health disparities**, that is, alleviating the gap in health outcomes and/or processes of care between different groups of people.⁹⁹ With racial/ethnic health disparities, health disparities have been defined as the difference in both outcomes and healthcare processes of care between non-Hispanic Whites and racial and ethnic minority groups. For diabetes, racial and ethnic health disparities have been pronounced and persistent, particularly for African Americans, American Indians and Hispanics/Latinx.¹¹

Recently, the focus has shifted to health equity, defined as the achievement of the highest level of health for all people.¹⁰⁰ Health equity requires that efforts are made to address factors such as racism and power imbalances and to focus attention on "upstream" issues that contribute to the long-standing health disparities that exist in our society. Health equity also requires that extra efforts must be made to achieve this goal among our most vulnerable populations (Figure 5).



Interaction Institute for Social Change | Artist: Angus Maguire.

To that end, greater emphasis is being placed on these "upstream" issues, known as the **social determinants of health (SDOH)**, which are conditions in which people live, learn, work, and play and how those conditions affect health risks and outcomes. Social and economic factors are believed to contribute to 40% of the quality and length of life in communities¹⁰¹ (Figure 6). The 2018 Health Equity Report released by the North Carolina Office of Minority Health and Health Disparities²⁹ and the recently released Healthy North Carolina 2030 Report¹⁰² focused on the drivers of health as outlined in the County Health Rankings Model (Figure 6).

There is strong evidence that diabetes prevention and management is influenced by the social determinants of health.¹⁰⁴ Disparities in diabetes indicators are very prominent across educational, economic and geographic groups, with the greatest burden experienced by those with limited formal education, those living below the poverty line and those living in rural communities with limited access to healthcare and resources to live healthy lives. In order to be as effective as possible in achieving our goals to reduce the burden of diabetes in our state, it is incumbent upon us to both recognize the impact of social determinants on diabetes prevention and management, but to also work collectively to ensure that health equity can be achieved through a concerted focus on the upstream factors.

Figure 6. County Health Rankings Population Health Model¹⁰³



Working to Address Social Determinants of Health and Health Equity at Multiple Levels

There are many things that community organizations can do to help support persons with diabetes and to assist in reducing the burden of diabetes in our state. Examples of what you and the organizations you belong to can do appear in the following sections.

We use the Socioecological Model of Health (Figure 7) to serve as a bridge between the core behaviors that help individuals prevent and manage their diabetes to the policy strategies that community groups, employers and healthcare providers can implement to support diabetes prevention and management.

Based on the socioecological model (SEM), the individual who is at risk for or who has diabetes will need to follow the behaviors previously described to protect their individual health. The interpersonal relationships that they have with their families and friends influence their behaviors. This prevention and management Guide does not address actions for friends and families because a variety of websites exist that support people with and at risk for diabetes (e.g., **Diabetes Sisters**, **Children with Diabetes**, **Taking Control of your Diabetes**). A list of these websites is included as Appendix A.

The population-based strategies that follow are those that organizations can implement to support individuals in the prevention of



diabetes and its complications. The list of activities builds on primary prevention activities. The list is organized by the group that can initiate the action (community, healthcare, employer, society) and is shown according to the stages of diabetes prevention and management. A description of each group is provided prior to the list of strategies.

Taken as a whole these and other strategies help the state, community groups and other agencies use the principles of population health and risk stratification to complement what healthcare providers do in assisting individuals with or at risk for diabetes—thereby helping to reduce the burden of diabetes far beyond an individual or family.



Individual

Individual decisions are based on attitudes, beliefs, knowledge and behaviors.

Relationship

The relationships of an individual (peers, partners, family members, healthcare providers) affect their ability to sustain behavior.

Community

The role of employers, schools, media, local governments, nonprofits, faith-based, professional and other associations creates an environment that supports an individual's ability to sustain behavior change.

Society

The larger role of our society and the state in advocacy and policy has an impact on an individual's ability to sustain behavior change.



Taken together, the socioecological model, social determinants of health and health equity provide cues towards what organizations can do towards addressing diabetes. Working together always accomplishes more long-lasting change than individual efforts. The following sections of the Guide address what "Community" and "Society" might accomplish. We all should consider these statements that focus on solutions rather than problems¹⁰⁵ as we figure out how to collaborate.

- 1. Health starts long before illness, in our homes, schools and jobs.
- 2. All people should have the opportunity to make the choices that allow them to live a long, healthy life, regardless of their income, education or ethnic background.
- 3. Your neighborhood or job should not be hazardous to your health.
- 4. Your opportunity for health starts long before you need medical care.
- 5. Health begins where we live, learn, work and play.
- 6. The opportunity for health begins in our families, neighborhoods, schools, and jobs.

What Can Employers Do?

Each year, the costs for diabetes, its complications, and associated diseases (comorbidities) continue to rise. In addition to the tremendous toll diabetes takes on individuals and families, it also has a significant impact in the workplace. People with diagnosed diabetes, on average, have medical expenses that are more than two times higher than those without diabetes. The national cost of diabetes in the United States in 2018 was more than \$327 billion, up from \$245 billion in 2012, a 26% increase.³⁶

Employers are in a unique position to address diabetes through prevention and management education and support of those with or at risk for diabetes. Employees spend more than one third of their lives at work and are more likely to participate in health and nutrition education and physical activity offered in the workplace. Everyone benefits when employers work with their employees who have diabetes, or are at risk for diabetes, to improve productivity and lower health costs, as well as help employees stay in good physical and mental health.

Employers, large and small, should partner with local and state-wide community and government agencies to be engaged and take active roles in supporting not only their own employees, but workers and nonworkers alike across North Carolina in reducing the risk for developing diabetes and supporting those who already do have diabetes.

Table 7: Activities for Employers

Diabetes Primary	Diabetes Prevention	Diabetes Management and
Prevention	for People at High Risk	Prevention of Complications
 To help manage weight and/or follow healthy eating guidelines 1. Post full nutrition information in cafeterias. 2. Offer healthful options within cafeterias and vending machines. 3. Establish regular Farmer's Markets at the worksite. 4. Provide educational/skill classes for healthy meal preparation. 5. Offer the benefit of employee participation in virtual or in-person Diabetes Prevention Programs through their health insurance programs. To help manage weight and/or participate in regular physical activity 1. Subsidize gym memberships. 2. Offer fitness centers or walking tracks on company property. 3. Sponsor weight loss programs which include a prize related to health such as the purchase of activity trackers. 	 To help participation in diabetes prevention education programs/CDC recognized lifestyle change programs 1. Offer the benefit of employee participation in virtual or in-person Diabetes Prevention Programs through their health insurance programs. 2. Partner with a diabetes prevention program to offer classes at work. 3. Create direct referral links between worksites and DSMES services. 4. Offer on-site screening to identify employees with undiagnosed diabetes, prediabetes, and other risk factors. 5. Provide incentives for milestone and/or completing the program. 	 To help participation in individual and/ or group self-management education programs Partner with healthcare providers, local public health, and community agencies to offer recognized Diabetes Self-Management Education and Support (DSMES) services at work. Partner with local specialists for pharmacy, podiatry, optometry, dental, and audiology (PPOD+A) care. To help persistence with personalized diabetes treatment plans Allow employees time off for diabetes screening and/or medical appointments without penalty. Offer wellness programs to assist in diabetes management. These may include programs to: a. Offer coverage of insulin at the minimal co-pay/ month.

- 4. Promote stair climbing and walking at lunch.
- 5. Offer weight management programs as a covered benefit.
- 6. Offer the benefit of employee participation in virtual or in-person Diabetes Prevention Programs through their health insurance programs.

To help live tobacco free

- 1. Connect with Quitline and smoking cessation opportunities.
- 2. Offer insurance subsidies for non-smokers.

To promote adequate sleep

- 1. Establish at least 10 consecutive hours per day of protected time off-duty to allow workers to obtain no fewer than seven to eight hours of sleep.
- Permit frequent brief rest breaks (e.g., every one to two hours) during mentally and physically demanding work, which are more effective against fatigue than a few longer breaks. Allow longer breaks for meals.
- 3. Schedule five eight-hour shifts or four 10-hour shifts per week, which are usually acceptable. Depending on the workload, 12-hour day shifts may be tolerated when interspersed with days off. During the evening and night, shorter shifts (e.g., eight hours) are better tolerated than longer shifts.
- 4. Examine work demands with respect to shift length. Twelve-hour shifts are more acceptable for "lighter" tasks (e.g., desk work).
- Plan one to two full days of rest following five consecutive eight-hour shifts or four consecutive 10-hour shifts. Consider two rest days after three consecutive 12-hour shifts.
- 6. Provide training to inform workers of the challenges linked to shift work and long work hours and what resources are available to them to help with any difficulty they are having with their work schedule.
- 7. Examine close calls and incidents to determine the role, if any, of fatigue as a root cause or contributing cause to the incident.





b. Offset the cost of medications for persons.

- c. Offer premium reductions for persons who maintain an A1C at their individualized goal.
- d. Offset costs of testing supplies and medications to assist in higher levels of self-management.
- Offer health screenings at work, particularly on diabetes point days (e.g., Diabetes Alert Day, National Diabetes Month) including screenings for complications (eye, hearing, feet).
- 6. Cover insulin pumps as a co-pay instead of as durable medical equipment.
- 7. Offer refrigerators at work for insulin storage.
- 8. Ensure that your benefits package allows for similar co-pays on insulin pens and insulin vials.
- 9. Cover continuous glucose monitors for all peoples with diabetes, regardless of type of diabetes, as a co-pay instead of as durable medical equipment.
- 10. Avoid the use of restricted formularies as these tend to highly limit the medications available to people and tie the hands of healthcare professionals as to what may work best for the people being treated.



References

1. Annual Report: North Carolina Summary 2019. America's Health Rankings, United Health Foundation. americashealthrankings.org/explore/annual/measure/Diabetes/ state/NC. Accessed July 9, 2020.

2. Centers for Disease Control and Prevention. *National Diabetes Statistics Report, 2020.* Atlanta, GA: Centers for Disease Control and Prevention, U.S. Dept of Health and Human Services. 2020; page 10. cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf.

3. Diabetes Mortality by State. National Center for Health Statistics. cdc.gov/nchs/pressroom/sosmap/diabetes_mortality/ diabetes.htm. Updated April 29, 2020. Accessed July 9, 2020.

4. Konen J, Page J. The state of diabetes in North Carolina. *N C Med J*. 2011; 72(5): 373-378. classic.ncmedicaljournal.com/ wp-content/uploads/2011/09/72505-web.pdf.

5. Israel BA, Schulz AJ, Parker EA, Becker AB, Allen AJ, Guzman JR. Critical issues in developing and following CBPR principles. In Minkler M, Wallerstein N, ed. *Community-based participatory research for health.* San Francisco, CA: Jossey-Bass; 2003:53-76.

6. Models and Frameworks for the Practice of Community Engagement. Agency for Toxic Substances and Disease Registry. atsdr.cdc.gov/communityengagement/pce_models. html. Updated June 25, 2015. Accessed July 10, 2020.

7. Dickinson JK, Guzman SJ, Maryniuk MD, O'Brian CA, Kadohiro JK, Jackson RA, et al. The use of language in diabetes care and education. *The Diabetes Educator*. 2017 Dec 1; 43(6); 551-564. doi.org/10.1177/0145721717735535.

8. American Diabetes Association. Standards of Medical Care in Diabetes – 2020. *Diabetes Care*. 2020 Jan; 43(S1): S1-S212. doi.org/10.2337/dc20-SINT.

9. Boyko EJ, Seelig AD, Ahroni JH. Limb- and person-level risk factors for lower-limb amputation in the Prospective Seattle Diabetic Foot Study. *Diabetes Care.* 2018 Apr; 41(4): 891-898. doi.org/10.2337/dc17-2210.

10. American Diabetes Association. Standards of Medical Care in Diabetes–2015. *Diabetes Care*. 2015 Jan; 38 (S1): S11, S38. care.diabetesjournals.org/content/38/Supplement_1.

11. Centers for Disease Control and Prevention. *National Diabetes Statistics Report, 2020.* Atlanta, GA: Centers for Disease Control and Prevention, U.S. Dept of Health and Human Services. 2020. cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf.

12. Diabetes Overview: Diagnosis. American Diabetes Association. diabetes.org/a1c/diagnosis. Accessed July 8, 2020.

13. The Surprising Truth About Prediabetes. cdc.gov. cdc.gov/ diabetes/library/features/truth-about-prediabetes.html. Updated June 11, 2020. Accessed July 8, 2020.

14. Gestational Diabetes. cdc.gov. cdc.gov/diabetes/basics/ gestational.html. Updated May 30, 2019. Accessed July 8, 2020.

15. Gestational Diabetes and Pregnancy. cdc.gov. cdc.gov/ pregnancy/diabetes-gestational.html. Updated February 27, 2020. Accessed July 8, 2020.

16. American Diabetes Association. Management of Diabetes in Pregnancy: Standards of Medical Care in Diabetes–2020. *Diabetes Care*. 2020 Jan; 43(S1): S190. doi.org/10.2337/ dc20-S014.

17. American Diabetes Association. Management of Diabetes in Pregnancy: Standards of Medical Care in Diabetes – 2020. *Diabetes Care*. 2020 Jan; 43(S1): S183-S192. doi.org/10.2337/ dc20-S014.

18. Type 2 Diabetes. cdc.gov. cdc.gov/diabetes/basics/type2. html. Updated May 30, 2019. Accessed July 8, 2020.

19. American Diabetes Association. Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes–2020. *Diabetes Care*. 2020 Jan; 43(S1): S19-20. doi.org/10.2337/ dc20-S002.

20. 2018 BRFSS Survey Results: North Carolina, Prediabetes. NC State Center for Health Statistics. schs.dph.ncdhhs.gov/ data/brfss/2018/nc/all/prediab.html. Published August 16, 2019. Accessed July 8, 2020.

21. Prediabetes – Your Chance to Prevent Type 2 Diabetes. cdc.gov. cdc.gov/diabetes/basics/prediabetes.html. Updated June 11, 2020. Accessed July 8, 2020.

22. 2012 BRFSS Survey Results: North Carolina, Diabetes. NC State Center for Health Statistics. schs.dph.ncdhhs.gov/data/ brfss/2012/nc/all/DIABETE3.html. Accessed November 20, 2013.

23. Divers J, Mayer-Davis EJ, Lawrence JM, et al. Trends in incidence of type 1 and type 2 diabetes among youths—Selected counties and Indian reservations, United States, 2002–2015. *MMWR Morb Mortal Wkly Rep.* 2020; 69: 161–165. doi.org/10.15585/mmwr.mm6906a3.

24. 2012 BRFSS Survey Results: North Carolina, Diabetes. NC State Center for Health Statistics. schs.dph.ncdhhs.gov/data/ brfss/2012/nc/all/DIABETE3.html. Published August 2, 2013. Accessed November 20, 2013. 25. Young LA et al. Diabetes in North Carolina: Descriptive epidemiology and meaningful use of electronic health records. *N C Med J.* 2011 Sep-Oct; 72(5): 383-386. ncbi.nlm.nih.gov/pmc/articles/PMC3392185.

26. 2012 BRFSS Survey Results: North Carolina, Diabetes — African Americans. NC State Center for Health Statistics. schs.dph.ncdhhs.gov/data/brfss/2012/nc/afam/ DIABETE3.html. Published August 6, 2013. Accessed November 20, 2013.

27. North Carolina Resident Population Health Data by Race and Ethnicity. NC State Center for Health Statistics. schs.dph.ncdhhs. gov/schs/pdf/NCPopHealthDatabyRaceEthOct2019v2.pdf. Published October 2019. Accessed July 8, 2020.

28. Leading Causes of Death, North Carolina Residents, 2012. NC State Center for Health Statistics. schs.dph.ncdhhs.gov/ data/vital/lcd/2012/pdf/TblsA-F.pdf. Published December 2013. Accessed March 10, 2014.

29. North Carolina Department of Health and Human Services, Office of Minority Health and Health Disparities. *Racial and Ethnic Health Disparities in North Carolina: North Carolina Health Equity Report 2018.* schs.dph.ncdhhs.gov/SCHS/pdf/ MinorityHealthReport_Web_2018.pdf. Accessed March 1, 2020.

30. 2018 BRFSS Survey Results: North Carolina, Diabetes. NC State Center for Health Statistics. schs.dph.ncdhhs.gov/data/ brfss/2018/nc/all/DIABETE3.html. Published August 16, 2019. Accessed April 8, 2020.

31. 2018 BRFSS Survey Results: Piedmont North Carolina, Chronic Health Conditions. NC State Center for Health Statistics. schs.dph.ncdhhs.gov/data/brfss/2018/pied/DIABETE3.html. Published August 16, 2019. Accessed July 8, 2020.

32. Barker LE et al. Geographic distribution of diagnosed diabetes in the U.S.: A diabetes belt. *Am J Prev Med.* 2011 Apr; 40(4): 434-439. doi.org/10.1016/j.amepre.2010.12.019.

33. Harding JL et al. Trends of nontraumatic lower-extremity amputation in end-stage renal disease and diabetes: United States, 2000-2015. *Diabetes Care*. 2019 Aug; 42(8): 1430-1435. doi.org/10.2337/dc19-0296.

34. Norton JM et al. Social determinants of racial disparities in CKD. *JASN*. 2016 Sep; 27(9): 2576-2595. doi.org/10.1681/ASN.2016010027.

35. Glantz NM et al. Racial disparities in the burden of end-stage renal disease due to diabetes among Medicare beneficiaries. *Diabetes.* 2018 Jul; 67(S1). doi.org/10.2337/db18-1281-P.

36. The Cost of Diabetes. American Diabetes Association. diabetes.org/resources/statistics/cost-diabetes. Accessed July 8, 2020.

37. American Diabetes Association. Economic costs of diabetes in the U.S. in 2012. *Diabetes Care*. 2013 Apr; 36(4): 1033, 1038. doi.org/10.2337/dc12-2625.

38. American Diabetes Association. Economic costs of diabetes in the U.S. in 2017. *Diabetes Care*. 2018 May; 41(5): Supplementary data. doi.org/10.2337/dci18-0007.

39. Inpatient Hospital Utilization and Charges by Principal Diagnosis and County of Residence, North Carolina, 2018. NC State Center for Health Statistics. schs.dph.ncdhhs.gov/data/ databook. Accessed June 12, 2019.

40. Guh DP, Zhang W, Bansback N, Amarsi Z, Birmingham CL, Anis AH. The incidence of co-morbidities related to obesity and overweight: A systematic review and meta-analysis. *BMC Public Health.* 2009 Mar 25; 9: 88. doi.org/10.1186/1471-2458-9-88.

41. Franz MJ. Weight management: Obesity to diabetes. *Diabetes Spectrum.* 2017 Aug; 30(3): 149-153. doi.org/10.2337/ ds17-0011.

42. American Diabetes Association. Facilitating behavior change and well-being to improve health outcomes: Standards of Medical Care in Diabetes–2020. *Diabetes Care*. 2020 Jan; 43(S1): 50-54. doi.org/10.2337/dc20-S005.

43. Evert AB, Dennison M, Gardner CD, Garvey WT, Lau KHK, MacLeod J, Mitri J, Pereira RF, Rawlings K, Robinson S, Saslow L, Uelmen S, Urbanski PB, Yancy WS Jr. Nutrition therapy for adults with diabetes or prediabetes: A consensus report. *Diabetes Care*. 2019 May; 42(5): 731-754. doi.org/10.2337/ dci19-0014.

44. Hirahatake KM, Bruno RS, Bolling BW, Blesso C, Alexander LM, Adams SH. Dairy foods and dairy fats: New perspectives on pathways implicated in cardiometabolic health. *Adv Nutr.* 2020 Mar 1; 11(2): 266-279. doi.org/10.1093/advances/nmz105.

45. Bhupathi V, Mazariegos M, Cruz Rodriguez JB, Deoker A. Dairy intake and risk of cardiovascular disease. *Curr Cardiol Rep.* 2020 Jan 29; 22(3): 11. doi.org/10.1007/s11886-020-1263-0.

46. Fontecha J, Visitación Calvo M, Juarez M, Gil A, Martínez-Vizcaino V. Milk and dairy product consumption and cardiovascular diseases: An overview of systematic reviews and meta-analyses. *Adv Nutr.* 2019 May 1; 10(S2): S164-S189. doi.org/10.1093/advances/nmy099.

47. Malik VS, Hu FB. Fructose and cardiometabolic health: what the evidence from sugar-sweetened beverages tells us. *J Am Coll Cardiol.* 2015 Oct; 66(14): 1615–1624. doi.org/10.1016/j. jacc.2015.08.025.

48. Rogers PJ, Hogenkamp PS, de Graaf C, et al. Does lowenergy sweetener consumption affect energy intake and body weight? A systematic review, including meta-analyses, of the evidence from human and animal studies. *Int J Obes*. 2016 Mar; 40(3): 381–394. doi.org/10.1038/ijo.2015.177.

49. Azad MB, Abou-Setta AM, Chauhan BF, et al. Nonnutritive sweeteners and cardiometabolic health: A systematic review and meta-analysis of randomized controlled trials and prospective cohort studies. *CMAJ.* 2017 Jul 17; 189(28): E929–E939. doi.org/10.1503/cmaj.161390.

50. Horne BD, Grajower MM, Anderson JL. Limited evidence for the health effects and safety of intermittent fasting among patients with type 2 diabetes. *JAMA*. 2020 July 2. doi.org/10.1001/jama.2020.3908.

51. Simple Steps to Preventing Diabetes. Harvard T.H. Chan School of Public Health. hsph.harvard.edu/nutritionsource/ preventing-diabetes-full-story/#diet. Accessed July 9, 2020.

52. AlEssa H, Bupathiraju S, Malik V, Wedick N, Campos H, Rosner B, Willett W, Hu FB. Carbohydrate quality, measured using multiple carbohydrate quality metrics, is negatively associated with risk of type 2 diabetes in US women. *Circulation*. 2015 Mar 4; 131(S1): A20. ahajournals.org/doi/abs/10.1161/ circ.131.suppl_1.20.

53. NCCDPHP Division of Nutrition and Physical Activity. *Research to Practice Series No. 2: Portion Size*. Atlanta, GA: Centers for Disease Control and Prevention. 2006. cdc.gov/ nccdphp/dnpa/nutrition/pdf/portion_size_research.pdf.

54. Ahn DT, Stahl R. Is there an app for that? The pros and cons of diabetes smartphone apps and how to integrate them into clinical practice. *Diabetes Spectrum.* 2019 Aug; 32(3); 231-236. doi.org/10.2337/ds18-0101.

55. Ding C, Chan Z, Magkos F. Lean, but not healthy: the 'metabolically obese, normal-weight' phenotype. *Curr Opin Clin Nutr Metab Care.* 2016 Nov; 19(6): 408-417. doi.org/10.1097/ MCO.000000000000317.

56. Perceived Exertion (Borg Rating of Perceived Exertion Scale). cdc.gov. cdc.gov/physicalactivity/basics/measuring/exertion. htm. Updated April 10, 2020. Accessed July 9, 2020.

57. U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General.* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. 2014. cdc.gov/tobacco/data_statistics/sgr/50th-anniversary/index.htm. Accessed September 11, 2015. 58. Foy CG, Bell FA, Farmer DR, Goff DC, Wagenknect LE. Smoking and incidence of diabetes among U.S. adults: Findings from the insulin resistance atherosclerosis study. *Diabetes Care.* 2005 Oct; 28(10): 2501-2507. doi.org/10.2337/ diacare.28.10.2501.

59. How Does Nicotine Affect Blood Sugar? WebMD.com. webmd.com/diabetes/nicotine-blood-sugar. Published July 1, 2019. Accessed March 25, 2020.

60. American Diabetes Association. Facilitating behavior change and well-being to improve health outcomes: Standards of Medical Care in Diabetes – 2020. *Diabetes Care*. 2020 Jan; 43(S1): S48-S65. doi.org/10.2337/dc20-S005.

61. Altun I, Cinar N, Dede C. The contributing factors to poor sleep experiences in according to the university students: A cross-sectional study. *J Res Med Sci.* 2012 Jun; 17(6): 557–561. ncbi.nlm.nih.gov/pmc/articles/PMC3634295.

62. Tononi G, Cirelli C. Sleep function and synaptic homeostasis. *Sleep Med Rev.* 2006 Feb; 10(1): 49-62. doi.org/10.1016/j. smrv.2005.05.002.

63. U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute. *Your Guide to Healthy Sleep.* 2005 Nov, revised 2011 Aug; NIH Publication No. 11-5271. nhlbi.nih.gov/files/docs/public/sleep/ healthy_sleep.pdf.

64. Vetter C, Dashti HS, Lane JM, Anderson SG, Schernhammer ES, Rutter MK, Saxena R, Scheer FAJL. Night shift work, genetic risk, and type 2 diabetes in the UK biobank. *Diabetes Care.* 2018 Apr; 41(4): 762-769. doi.org/10.2337/dc17-1933.

65. Gami AS, Olson EJ, Shen WK, et al. Obstructive sleep apnea and the risk of sudden cardiac death: A longitudinal study of 10,701 adults. *J Am Coll Cardiol.* 2013 Aug 13; 62(7): 610–616. doi.org/10.1016/j.jacc.2013.04.080.

66. Pippitt K, Li M, Gurgle HE. Diabetes mellitus: Screening and diagnosis. *Am Fam Physician*. 2016 Jan 15; 93(2): 103-109. aafp.org/afp/2016/0115/p103.html.

67. Diabetes Risk Factors. cdc.gov. cdc.gov/diabetes/basics/ risk-factors.html. Updated March 24, 2020. Accessed February 24, 2020.

68. National Diabetes Prevention Program. cdc.gov. cdc.gov/ diabetes/prevention/index.html. Updated August 10, 2019. Accessed July 9, 2020.

69. PCOS (Polycistic Ovary Syndrome) and Diabetes. cdc.gov. cdc.gov/diabetes/basics/pcos.html. Updated March 24, 2020. Accessed July 9, 2020.

70. Make Your Workout Work for You. cdc.gov. cdc.gov/features/ diabetes-physical-activity/index.html. Updated April 12, 2019. Accessed July 9, 2020. 71. Wilcox G. Insulin and insulin resistance. *Clin Biochem Rev.* 2005 May; 26(2): 19-39. ncbi.nlm.nih.gov/pmc/articles/ PMC1204764.

72. Portillo-Sanchez P, Bril F, Maximos M, et al. High prevalence of nonalcoholic fatty liver disease in patients with type 2 diabetes mellitus and normal plasma aminotransferase levels. *J Clin Endocrinol Metab.* 2015 Jun; 100(6): 2231-2238. doi.org/10.1210/jc.2015-1966.

73. Diabetes Prevention Program Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med.* 2002 Feb 7; 346: 393-403. doi.org/10.1056/NEJMoa012512.

74. Diabetes prevention program. Medicare.gov. medicare.gov/ coverage/diabetes-prevention-program. Accessed February 27, 2020.

75. American Diabetes Association. Standards of Medical Care in Diabetes–2017. *Diabetes Care*. 2017 Jan 1; 40(S1); S1-S135. doi.org/10.2337/dc17-S001.

76. American Diabetes Association. Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes–2020. *Diabetes Care*. 2020 Jan; 43(S1): S14-S31. doi.org/10.2337/ dc20-S002.

77. American Diabetes Association. Comprehensive Medical Evaluation and Assessment of Comorbidities: Standards of Medical Care in Diabetes – 2020. *Diabetes Care*. 2020 Jan; 43(S1): S37-S47. doi.org/10.2337/dc20-S004.

78. Umpierrez GE, Klonoff DC. Diabetes technology update: Use of insulin pumps and continuous glucose monitoring in the hospital. *Diabetes Care.* 2018 Aug; 41(8): 1579–1589. doi.org/10.2337/dci18-0002.

79. Battelino T, Danne T, Bergenstal RM, Amiel SA, Beck R, Biester T, Bosi E, Buckingham BA, Cefalu WT, Close KL, Cobelli C, Dassau E, DeVries JH, Donaghue KC, Dovc K, Doyle FJ 3rd, Garg S, Grunberger G, Heller S, Heinemann L, Hirsch IB, Hovorka R, Jia W, Kordonouri O, Kovatchev B, Kowalski A, Laffel L, Levine B, Mayorov A, Mathieu C, Murphy HR, Nimri R, Nørgaard K, Parkin CG, Renard E, Rodbard D, Saboo B, Schatz D, Stoner K, Urakami T, Weinzimer SA, Phillip M. Clinical targets for continuous glucose monitoring data interpretation: Recommendations from the international consensus on time in range. *Diabetes Care.* 2019 Aug; 42(8): 1593-1603. doi.org/10.2337/dci19-0028.

80. Lu J, Ma X, Zhou J, et al. Association of time in range, as assessed by continuous glucose monitoring, with diabetic retinopathy in type 2 diabetes. *Diabetes Care.* 2018 Nov; 41(11): 2370–2376. doi.org/10.2337/dc18-1131.

81. American Diabetes Association. Glycemic Targets: Standards of Medical Care in Diabetes –2020. *Diabetes Care*. 2020 Jan; 43(S1): S68. doi.org/10.2337/dc20-S006. 82. Beck RW, Bergenstal RM, Cheng P, et al. The relationships between time in range, hyperglycemia metrics, and HbA1c. *J Diabetes Sci Technol.* 2019 Jan 13; 13(4): 614-626. doi.org/10.1177/1932296818822496.

83. Strawbridge L, Lloyd J, Meadow A, Riley G, Howell B. One-year outcomes of diabetes self-management training among Medicare beneficiaries newly diagnosed with diabetes. *Med Care.* 2017 Apr; 55(4): 391-397. doi.org/10.1097/ MLR.000000000000653.

84. Davies MJ, D'Alessio DA, Fradkin J, Kernan WN, Mathieu C, Mingrone G, Rossing P, Tsapas A, Wexler DJ, Buse JB. Management of Hyperglycemia in Type 2 Diabetes, 2018: A Consensus Report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). *Diabetes Care*. 2018 Dec; 41(12): 2669–2701. doi.org/10.2337/ dci18-0033.

85. American Association of Diabetes Educators. An effective model of diabetes care and education: Revising the AADE7 Self-Care Behaviors[®]. *The Diabetes Educator*. 2020 Apr 1; 46(2): 139-160. doi.org/10.1177/0145721719894903.

86. Beck J, Greenwood D, Blanton L, et al. 2017 national standards for diabetes self-management education and Support. *The Diabetes Educator*. 2017 Oct 1; 43(5): 449-464. doi.org/10.1177/0145721717722968.

87. Chrvala CA, Sherr D, Lipman RD. Diabetes self-management education for adults with Type 2 diabetes mellitus: a systematic review of the effect on glycemic control. *Patient Educ Couns.* 2016 Jun; 99(6): 926-943. doi.org/10.1016/j.pec.2015.11.003.

88. Powers MA, Bardsley JK, Cypress M, Funnell MM, Harms D, Hess-Fischl A, Hooks B, Isaacs D, Mandel ED, Maryniuk MD, Norton A, Rinker K, Siminerio LM, Uelmen S. Diabetes self-management education and support in adults with type 2 diabetes: A consensus report of the American Diabetes Association, the Association of Diabetes Care & Education Specialists, the Academy of Nutrition and Dietetics, the American Academy of Family Physicians, the American Academy of PAs, the American Association of Nurse Practitioners, and the American Pharmacists Association. *Diabetes Care*. 2020 Jul; 43(7): 1636-1649. doi.org/10.2337/dci20-0023.

89. Beck J, Greenwood DA, Blanton L, Bollinger ST, Butcher MK, Condon JE, Cypress M, Faulkner P, Fischl AH, Francis T, Kolb LE, Lavin-Tompkins JM, MacLeod J, Maryniuk M, Mensing C, Orzeck EA, Pope DD, Pulizzi JL, Reed AA, Rhinehart AS, Siminerio L, Wang J. 2017 national standards for diabetes self-management education and support. *The Diabetes Educator*. 2020 Feb; 46(1): 46-61. doi.org/10.1177/0145721719897952.

90. American Diabetes Association. Facilitating behavior change and well-being to improve health outcomes: Standards of Medical Care in Diabetes–2020. *Diabetes Care*. 2020 Jan; 43(S1): S49. doi.org/10.2337/dc20-S005.

91. Know your Blood Sugar Numbers: Use Them to Manage Your Diabetes. National Institute of Diabetes and Digestive and Kidney Diseases. niddk.nih.gov/health-information/diabetes/ overview/managing-diabetes/know-blood-sugar-numbers. Published March 2016.

92. Healthy Living with Diabetes: Getting the Vaccines You Need. cdc.gov. cdc.gov/vaccines/adults/rec-vac/health-conditions/ diabetes/infographic/index.html. Updated May 2018. Accessed July 10, 2020.

93. Association of Diabetes Care and Education Specialists (ADCES). *Vaccination Practices for Adults with Diabetes*. Chicago, IL; Association of Diabetes Care and Education Specialists; 2019. diabeteseducator.org/docs/default-source/ practice/educator-tools/vaccination-practices-for-adults-withdiabetesv2.pdf?sfvrsn=2.

94. Diabetes and Vaccines. Association of Diabetes Care and Education Specialists (ADCES). diabeteseducator.org/living-withdiabetes/Tools-and-Resources/vaccine-resources. Accessed July 17, 2020.

95. Fleischman S. I am... I have... I suffer from...: a linguist reflects on the language of illness and disease. *J Med Human.* 1999 Mar; 20(1): 3-32. link.springer.com/ article/10.1023/A:1022918132461.

96. Benedetti F. How the doctor's words affect the patient's brain. *Eval Health Prof.* 2002 Dec 1; 25(4): 369-386. doi.org/10.1177/0163278702238051.

97. Dickinson JK. The experience of diabetes-related language in diabetes care. *Diabetes Spectrum*. 2018 Feb; 31(1): 58-64. doi.org/10.2337/ds16-0082.

98. What You Say Matters. Association of Diabetes Care and Education Specialists (ADCES). diabeteseducator.org/practice/ practice-tools/app-resources/diabetes-language-paper. Accessed July 17, 2020.

99. Disparities. US Department of Health and Human Services, Office of Disease Prevention and Health Promotion. healthypeople.gov/2020/about/foundation-health-measures/ Disparities. Accessed March 1, 2020.

100. What is Health Equity? Robert Wood Johnson Foundation. rwjf.org/en/library/research/2017/05/what-is-health-equity-.html. Published May 1, 2017. Accessed March 1, 2020.

101. County Health Rankings Model. County Health Rankings & Roadmaps. countyhealthrankings.org/explore-health-rankings/ measures-data-sources/county-health-rankings-model. Accessed March 1, 2020.

102. North Carolina Institute of Medicine and North Carolina Department of Health and Human Services. *Healthy North Carolina 2030: A Path Towards Health.* Morrisville, NC: North Carolina Institute of Medicine; 2020. nciom.org/wp-content/ uploads/2020/01/HNC-REPORT-FINAL-Spread2.pdf. Accessed March 1, 2020.

103. University of Wisconsin Population Health Institute. What Works? Social and Economic Opportunities to Improve Health for All. September 2018. countyhealthrankings.org/ reports/what-works-social-and-economic-opportunities-toimprove-health-for-all.

104. Addressing Health Disparities in Diabetes. cdc.gov. cdc.gov/diabetes/disparities.html. Updated April 15, 2019. Accessed March 1, 2020.

105. Robert Wood Johnson Foundation. *A New Way to Talk about the Social Determinants of Health*. Robert Wood Johnson Foundation; 2010. societyforhealthpsychology.org/wp-content/uploads/2016/08/rwjf63023.pdf.

106. Allen NA, Colicchio VD, Litchman ML, Gibson B, Villalta J, Sanchez-Birkhead AC. Hispanic community-engaged research: Community partners as our teachers to improve diabetes selfmanagement. *Hispanic Health Care International*. 2019 Sep 1; 17(3): 125-132. doi.org/10.1177/1540415319843229.

107. Wroe JB. How can the media be best used to influence the diabetes policy makers? *Practical Diabetes International.* 2006 May; 23(4): 178-182. doi.org/10.1002/pdi.939.

108. Gross TT, Story CR, Harvey IS, et al. "As a community, we need to be more health conscious": Pastors' perceptions on the health status of the black church and African American communities. *J Racial Ethn Health Disparities*. 2018 Jun; 5(3): 570-579. doi.org/10.1007/s40615-017-0401-x.

109. National Diabetes Education Program. *Faith Leaders Toolkit: Diabetes Prevention and Management*. National Institutes of Health and Centers for Disease Control and prevention; 2017. peersforprogress.org/wp-content/uploads/2016/06/160627-faithleaders_toolkit.pdf.

110. Miller RS, Mars D. Effectiveness of a diabetes education intervention in a faith-based organization utilizing the AADE7. *ADCES in Practice.* 2020 Jan 1; 8(1): 10-14. doi.org/10.1177/2633559X20887746.

111. Sawani J. A new type of church outreach: Diabetes education. Michigan Health Lab. labblog.uofmhealth.org/ body-work/a-new-type-of-church-outreach-diabetes-education. Published October 4, 2018.

112. Eat Smart, Move More North Carolina. *North Carolina's Plan to Address Overweight and Obesity.* Raleigh, NC: Eat Smart, Move More North Carolina; 2020. eatsmartmovemorenc.com/ who-we-are/#ObesityPlan.

113. Acting Locally. In Institute of Medicine (US) and National Research Council (US) Committee on Childhood Obesity Prevention Actions for Local Governments; Parker L, Burns AC, Sanchez E, ed. *Local Government Actions to Prevent Childhood Obesity*. Washington (DC): National Academies Press (US); 2009. ncbi.nlm.nih.gov/books/NBK219685.

114. Olenik NL, Fletcher LM, Gonzalvo JD. The community pharmacist as diabetes educator. *AADE in Practice*. 2015 Sep 1; 3(5): 46-50. doi.org/10.1177/2325160315597197.

115. Claypool TM. Pharmacy medication therapy management: A critical piece of the diabetes management puzzle. *AADE in Practice*. 2015 Mar 1; 3(2): 12-16. doi.org/10.1177/2325160314568368.

116. Association of Diabetes Care and Education Specialists (ADCES). *Community Health Workers as Diabetes Paraprofessionals in DSMES and Prediabetes*. Chicago, IL; Association of Diabetes Care and Education Specialists; 2019. 1-5. diabeteseducator.org/docs/default-source/practice/practicedocuments/practice-papers/adces-community-health-workersas-diabetes-paraprofessionals-in-dsmes-and-prediabetes---final-4-1-20.pdf?sfvrsn=4.

117. Crespo R, Hatfield V, Hudson J, Justice M. Partnership with community health workers extends the reach of diabetes educators. *AADE in Practice*. 2015 Mar 1; 3(2): 24-29. doi.org/10.1177/2325160315569046.

118. Diabetes Prevention: Interventions Engaging Community Health Workers Improve Risk Factors and Health Outcomes. The Guide to Community Preventive Services (The Community Guide): Recommendations from the Community Preventive Services Task Force (CPSTF). the community guide.org/content/ community-health-worker-interventions-help-prevent-diabetes. Published April 2017.

119. Brunton S. Therapeutic inertia is a problem for all of us. *Clinical Diabetes.* 2019 Apr; 37(2): 105-106. doi.org/10.2337/ cd19-0009.

120. Together 2 Goal. together2goal.org. Accessed July 10, 2020.

121. Overcoming Therapeutic Inertia. American Diabetes Association. professional.diabetes.org/meeting/other/ overcoming-therapeutic-inertia. Accessed March 2020.

122. Local Barbershops and Beauty Salons are the "Heart" of New Program to Improve Heart Health. Blue Cross Blue Shield of North Carolina. mediacenter.bcbsnc.com/news/localbarbershops-and-beauty-salons-are-the-heart-of-new-programto-improve-heart-health. Published February 24, 2020.

123. Pearson TL, Bardsley J, Weiner S, Kolb L. Population Health: The diabetes educator's evolving role. *The Diabetes Educator*. 2019 Aug 1; 45(4): 333-348. doi.org/10.1177/0145721719857728. 124. Green LW, Brancati FL, Albright A, the Primary Prevention of Diabetes Working Group. Primary prevention of type 2 diabetes: Integrative public health and primary care opportunities, challenges and strategies. *Family Practice*. 2012 Apr 1; 29(S1): i13-i23. doi.org/10.1093/fampra/cmr126.

125. Centers for Disease Control and Prevention, Office on Smoking and Health. *Preventing Tobacco Use Among Children and Young Adults: A Report of the Surgeon General.* 2012. cdc.gov/tobacco/data_statistics/sgr/2012/consumer_booklet/ pdfs/consumer.pdf. Accessed September 11, 2015.

126. Lycett D et al. The association between smoking cessation and glycemic control in patients with Type 2 diabetes: A THIN database cohort study. *The Lancet Diabetes & Endocrinology*. 2015 June; 3(6): 423–430. doi.org/10.1016/S2213-8587(15)00082-0.

127. Lajous M, Tondeur L, Fagherazzi G, de Lauzon-Guillain B, Boutron-Ruaualt M, Clavel-Chapelon F. Childhood and adult secondhand smoke and type 2 diabetes in women. *Diabetes Care.* 2013 Sep; 36(9): 2720-2725. doi.org/10.2337/dc12-2173.

128. Knopf T. For many, Medicaid expansion is personal. *North Carolina Health News*. 2019 Feb 28. northcarolinahealthnews. org/2019/02/28/for-many-medicaid-expansion-is-personal.

129. Spencer JC, Gertner AK, Silberman PJ. Health status and access to care for the North Carolina Medicaid gap population. *NC Med J.* 2019 Sep-Oct; 80(5): 269-275. doi.org/10.18043/ ncm.80.5.269.

130. Garfield R, Orgera K, Damico A. The Coverage Gap: Uninsured Poor Adults in States That Do Not Expand Medicaid. Henry J Kaiser Family Foundation; January 2020. files.kff.org/ attachment/Issue-Brief-The-Coverage-Gap-Uninsured-Poor-Adults-in-States-that-Do-Not-Expand-Medicaid.

131. Lee J, Callaghan T, Ory M, Zhao H, Bolin JN. The impact of Medicaid expansion on diabetes management. *Diabetes Care*. 2020 May; 43(5): 1094-1101. doi.org/10.2337/dc19-1173.

132. American Diabetes Association. *Diabetes Care*. 1996 Jan; 19(S1): S1-S118. doi.org/10.2337/diacare.19.1.S1; care.diabetesjournals.org/content/19/Supplement_1.





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