SPRING 2026 A PUBLICATION OF THE ASSOCIATION OF DIABETES CARE & EDUCATION SPECIALISTS adces.org

ADCES

IN PRACTICE

ISSN: 2633-559X

Loneliness and Isolation – What is Our Role as CDCESs?

In this issue:

- Familiarize ourselves with methods to assess for social isolation and loneliness and provide resources and support to people with diabetes who need to re-establish social connectedness.
- Review the current definitions of eating disorders and disordered eating along with tools and resources to better assess, provide and refer to appropriate treatment.
- Learn more about diabetes-related hearing loss, the "silent side effect" of diabetes, and identify methods for assessing and referring those who are at risk.
- As the management of diabetes and chronic opioid therapy becomes increasingly common, particularly in patients with painful diabetes-related neuropathy, discover more about the crucial role of the DCES in navigating the complexities of these concurrent treatments.

Your Community. Your Conference.

ADCES26 | EXPERTISE IN ACTION

AUGUST 7–10, 2026 | COLUMBUS, OHIO

ADCES26 is heading to Columbus, OH!

If you're seeking fresh perspectives, come swap stories with 3,000+ peers as the nation's leading conference on diabetes care, education and technology heads to the heart of the Midwest for the first time ever!

This is where evidence meets implementation, and new skills transform theories into tangible results. From innovations to policy and advocacy insights, you'll explore what's possible and walk away with practical strategies you can put to work immediately. Plus, earn up to 48.5 CE/CME! Come for world-class education. Leave ready to move your practice forward. **That's Expertise in Action.**

ADCES26 REGISTRATION DATES

	Early Bird March 31–June 25	**Standard** June 26–December 29
Member: Full Program	$450	$550
Nonmember: Full Program	$650	$750
Student (No CE/CME)	$120	$120

SAVE $100 WITH EARLY BIRD REGISTRATION.
NOT A MEMBER?
JOIN NOW TO **SAVE $200!**

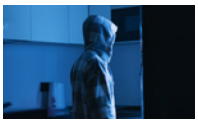
Be sure to join when you **register to SAVE $200** on full-conference registration. With savings like that, your membership almost pays for itself. Plus, members access year-round benefits including CE, resources, advocacy support and professional community.

adcesmeeting.org

ADCES | IN PRACTICE

A PUBLICATION OF THE ASSOCIATION OF DIABETES CARE & EDUCATION SPECIALISTS | SPRING 2026

ADCES7 TOPIC AREAS



ADCES PRACTICE PAPER SUMMARY

Also in This Issue

ADCES in Practice is a journal of ideas. It's a platform for diabetes care and education specialists and other health professionals to share innovations, challenges, successes, and hopes with colleagues. That's why we are excited to dedicate this page to you, our readers.

We invite you to write to us with your thoughts and impressions about articles we've published. We welcome your reactions and questions about what you've read in these pages. We call on you to comment or expand on the concepts and strategies put forth. We ask that you support or challenge our authors' words, as you see fit, and to give them the opportunity to hear and respond to you.

Our hope is for open and honest discourse that leads to improved care and outcomes for our patients. You may send your comments to adcesinpractice@gmail.com.

From Our Readers is a forum for commenting on articles published in *ADCES in Practice*. The length should not exceed 800 words of text with a minimal number of references. One table or figure may be included, if necessary. Any comments regarding a specific article must include the title, author(s), and date of publication. Comments that include questions or critique of a previously published paper will be forwarded to the author(s) of that article for a reply. The sharing of ideas, experiences, opinions, and alternative views is encouraged. The Editor in Chief of *ADCES in Practice* reserves the right to accept, reject, or excerpt letters for clarity and appropriateness of content, and to accommodate space requirements. Submissions may be sent to adcesinpractice@gmail.com.

ADCES | IN PRACTICE

A PUBLICATION OF THE ASSOCIATION OF DIABETES CARE & EDUCATION SPECIALISTS

ADCES in Practice (ISSN 2633-559X) (J712) is published quarterly in Winter, Spring, Summer and Fall for the Association of Diabetes Care & Education Specialists, by Sage Publications, 2455 Teller Road, Thousand Oaks, CA 91320. Send address changes to *ADCES in Practice*, c/o Sage Publications, 2455 Teller Road, Thousand Oaks, CA 91320.

From the Editor

AMY HESS-FISCHL, MS, RDN, LDN, BC-ADM, CDCES

Welcome to the spring 2026 issue of *AIP*, my friends. For those with the changing seasons in your necks of the woods, I trust you have come out from under winter with a fresh perspective and a renewed sense of adventure for the seasons ahead.

As we all know, DSMES does not take a winter slumber but forges ahead regardless of the season. I am grateful to the authors and reviewers who make the issue possible. Our spring issue is packed with a plethora of practical information regardless of your practice setting.

In the ADCES7 self-care behavior topic areas, you will find "Eating Disorders and Diabetes: How to Identify, Treat, and Manage Them in People With Diabetes"; "Navigating the Crossroads of Diabetes and Chronic Opioid Therapy: Differentiating Hypoglycemia from Opioid Withdrawal"; "Loneliness and Social Isolation: What Is Our Role as CDCESs?"; "Diabetes-Related Sensorineural Hearing Loss: The 'Silent Side Effect of Diabetes'"; and "Building the Bridge to Optimal Diabetes-Cardiometabolic Care Leveraging Artificial Intelligence." For those looking for a CQI project, "Embracing Risk Assessment: Using the Failure Mode and Effect Analysis (FMEA) Process in CQI" is definitely for you!

But wait! There's more! Each issue so far has included content from the Research Committee, and this issue features "Innovation Through Evidence: Introducing the ADCES 2026-2028 Research Agenda." Under the "Organizations You Should Know" umbrella, Breakthrough T1D, formerly JDRF, gives us an update on the changes and updates and links to their free resources for our patients with T1D. We also have an ADCES Award Winner "Practice Pearls" from the DCES of the Year, Katelyn O'Brien, PharmD, BCPS, CDCES, BC-ADM, titled "Who Should CaRe? Me! The Role of the CDCES in Cardio Renal and Metabolic Continuum."

As with every issue, you will find "Test Your Knowledge" questions and the quarterly "Member Perspectives" question: What's your advice for getting patients to return after the initial visit? We have also added a "Patient Perspective" column, which includes "a day in the life" of a person with diabetes who is also an emergency room physician.

I hope you find something in this issue that resonates with you. I am eternally grateful to the authors and reviewers! I may sound like a broken record, but feel free to reach out with your questions or content pitches. I so look forward to hearing from all of you!

Although I know I am dating myself, but I cannot help quoting the 1993 movie, *Groundhog Day*, with Bill Murray. In fact, ANY movie with Bill Murray is worth quoting, in my opinion. But, I digress. In the movie, a man asks Phil Connors/Bill Murray, "Do you think it will be an early spring?", to which Bill replies, quoting a poem by Samuel Taylor Coleridge (https://www.poetryfoundation.org/poems/43999/work-without-hope). And with that, I leave you with his famous words: "Winter, slumbering in the open air, wears on its smiling face a dream . . . of spring. Ciao." ■

You know the value of your services, but do others?

Learn how to generate support with the ADCES Showcasing the Value of Your Services Toolkit

- **Does your administration value your program?**
- **Are you flush with referrals?**
- **Do people with diabetes in your community know you are there for them?**

If you answered no or not sure to any of these, our new toolkit is meant for you! Created with our membership in mind, this toolkit is designed to help you reach and influence three different audiences: administrators, prescribers and people with diabetes in your community.

Learn from fellow diabetes care and education specialists who share the challenges they've faced when trying to articulate the value of their services and the steps they took to overcome them. You'll also find well-tested materials created by the CDC that promote DSMES services, a health literacy guidebook to ensure your materials are appropriate and effective, and guidance for creating content that utilizes person-centered language.

This resource was curated specially for our ADCES members.

To explore the toolkit, log in with your member ID.

ADCES®

Next Stop on the Highway: Columbus, OH!

President

KATHERINE S. O'NEAL, PHARMD, MBA, BCACP, CDCES, BC-ADM, AE-C, CLS, FADCES , FAPHA

It is hard to believe that it has been several months now that I have traveled on my highway of adventures and journey as President of ADCES. The journey has been full speed ahead with my foot on the gas pedal. I'd like to "pull over" and share some highlights.

At the annual conference and at the technology conference, when among other diabetes care and education specialists (DCESs), have heard this comment repeatedly: "I am with my people." This hit home for me, and as I thought about it more, another way to say this came to mind: "We are family." We are all trying to do the same thing in working with people with diabetes or at risk of diabetes. I immediately reflected on the topic of implicit bias introduced at ADCES25. The American Psychological Association describes implicit bias as a "negative attitude, of which one is not consciously aware, against a specific social group."[1] Dr Anthony Greenwald and his colleagues developed the implicit association test (IAT) in 1998 to measure differences in implicit social cognition. Drs Benedek Kurdi and Tessa Charlesworth took the work of Dr Greenwald and colleagues on IAT and connected it to culture. Dr Charlesworth describes that "IAT came out of a basic scientific inquiry to understand the nature of the mind, of societies, and of cultural differences [and that] implicit measures are much more tuned in to the specific kinds of conversations we're having only about certain topics". Okay, now we're putting the car in park.

These influential conversations, cultural differences, and social exposures can be tied to cultural sensitivity and even health literacy sensitivity. Eureka! If we approached one another, including our patients, with these concepts in mind, can we improve patient care and also minimize implicit bias? I don't know the answer, but it is definitely worth trying. Cultural sensitivity is appreciating differences. In my research, I have come across 2 concepts of what is called the "4 Cs." One concept is related to understanding the patient's perspective: call, cause, cope, and concerns.[2] This stands for the following 4 questions: (1) What do you call your problem?; (2) What do you think caused your problem?; (3) How do you cope with your condition?; and (4) What are your concerns about the condition/treatment. The second concept is related to cultural humility and personal growth: curiosity, comfort, clarity and confidence.[3] This stands for (1) being open to explore areas of ignorance, discomfort, and difference with accountability and responsiveness; (2) getting comfortable with discomfort; (3) understanding yourself and how other people see you; and (4) putting it all together. If we combine both concepts of the 4 Cs with health literacy sensitivity, provider-patient communication and trust, I hope, would naturally improve. As human beings, we are

naturally all different; however, as DCESs, we're all trying to do the same thing, so let's do what we can to personalize care and better understand each other to ultimately improve patient outcomes.

Time to get back on the highway. ADCES26 is just a few months away! Take a "right turn" on your highway and register for ADCES26. We have amazing speakers lined up and innovative research posters that will have you reflecting on your own practice, learning and gaining new clinical knowledge, expanding your cultural humility, and connecting with others. Please, get on your highway of adventures, take a pit stop, and join your "family" in Columbus, OH, for the annual conference! I would also like to extend a personal invitation to each of you for the annual CB/LNG/COI reception on Thursday evening of the conference. I like to describe this as a family reunion, and I know I can speak for all when I say, "Join us! We're all family here!" I look forward to meeting you all.

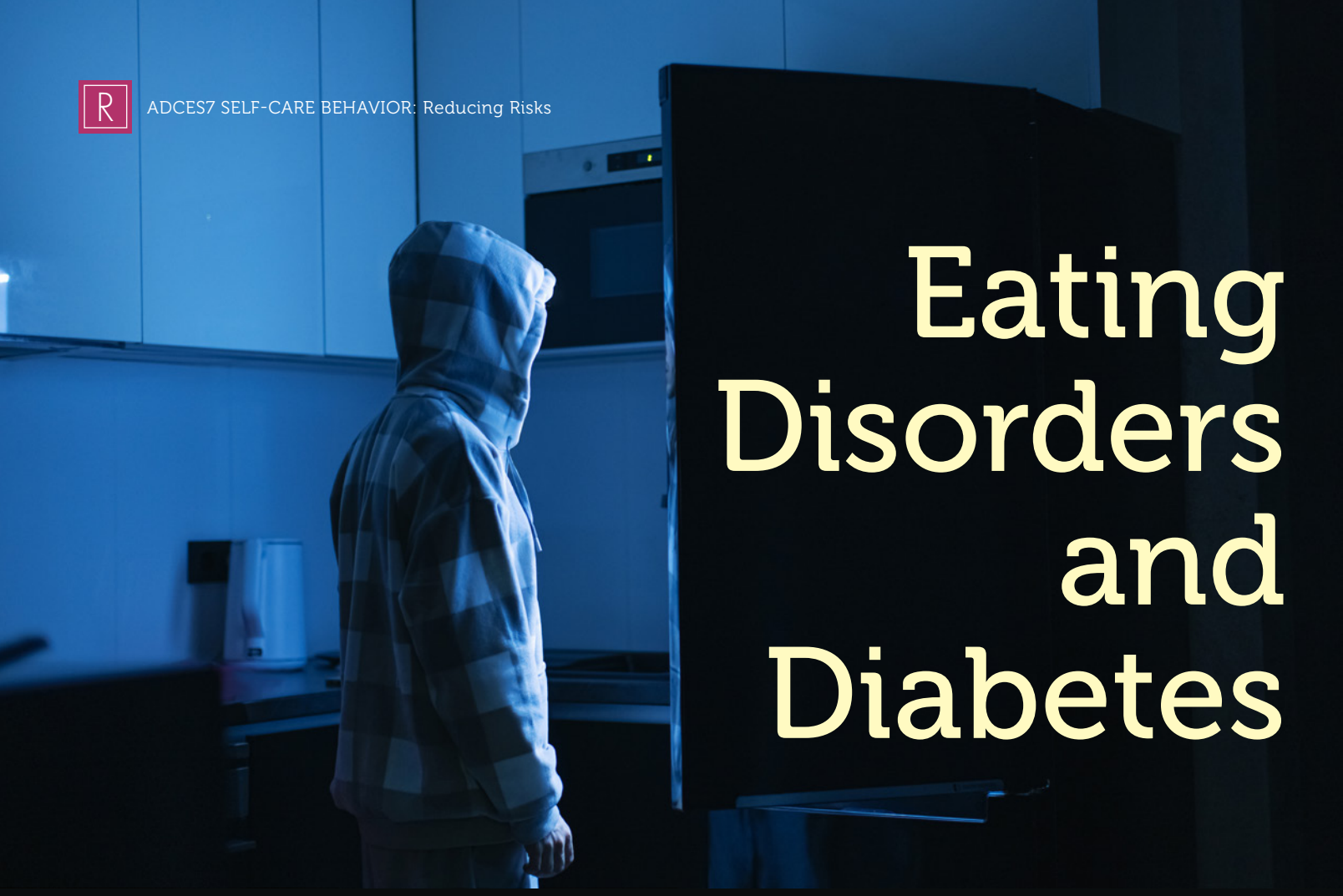
See you soon! ■

REFERENCES

1. Weir K. The implicit association test: shining a light on hidden beliefs. American Psychological Association. Published May 14, 2025. Accessed January 4, 2026. https://www.apa.org/research-practice/conduct-research/hidden-association

2. Slavin S, Galanti GA, Kuo A. The 4 C's. Ggalanti.org. Accessed January 4, 2026. https://ggalanti.org/the-4cs-of-culture/

3. Wong A. Understanding cultural competence and humility. Insidetrack. Published March 10, 2022. Accessed January 4, 2026. https://www.insidetrack.org/blog/understanding-cultural-competence-and-humility



Eating Disorders and Diabetes

How to Identify, Treat and Manage Them in People with Diabetes

TANISHA ROBINSON, PHD, LCSW

As a diabetes care and education specialist (DCES), I work with my patients to better understand diabetes and how they can best manage their lifestyle and treatment needs. In my training as a clinical social worker, I learned about clinical eating disorders, but it was not until I began working in the field of metabolic medicine focusing on both diabetes and obesity that I began to better appreciate how the 2 fields overlap and the need for DCESs to expand their skills and competencies in screening and recognizing the signs and symptoms of eating disorders. This would lead to better referrals for treatment that would coincide with maintaining both mental health and diabetes management. In a study conducted by public health researchers, it was found that people with diabetes are at an elevated risk (1 in 5 people with diabetes) of developing an eating disorder.[1] The most common clinical eating disorders include anorexia nervosa, bulimia nervosa, and binge eating disorder. These diagnoses can manifest differently for people with diabetes, and treatment should be a team effort with the provider, the nursing staff, the DCES, the registered dietitian nutritionist (RDN), the diabetes clinical mental health professional, and most importantly, the patient and their family and/or support staff.

What Are Clinical Eating Disorders and Disordered Eating?

The most commonly diagnosed and treated eating disorders are anorexia nervosa, bulimia nervosa, and binge eating disorder (for prevalence statistics, see Table 1).[1] A clinical eating disorder is a serious mental health condition that affects a person's eating habits, thoughts on food and food intake, their emotions on food and their personal body image—generally being a negative self-image.[1] People with diabetes may experience eating disorders, which can correlate with unhealthy eating habits that have developed, mismanagement of medications, being overweight or obese, and episodes of emotional or stress eating. A study conducted in 2020 reviewed 13 surveys and showed that health care professionals reported challenges in being able to screen, detect, and treat eating disorders in adolescents with type 1 diabetes due to a lack of validated screening tools, treatment guidelines and a lack of integration for treatment across specialties.[3] Clinical psychological treatment of eating disorders and diabetes is not standardized, but having a clinical mental health provider, specialized in health psychology, who is also well versed in diabetes on the treatment team is an asset to be able to support people and families experiencing not only eating disorders but also diabetes distress, diabetes burnout, and other diabetes-related stressors.[3]

Disordered eating is classified as a group of symptoms that a person can have that do not equate to a clinical eating disorder but may experience and may be diagnosed with one if not treated in early stages. Disordered eating symptoms can include dieting for weight loss, binge eating or overeating, excessive exercise, use of laxatives or diuretics for the purpose of weight loss, and purging. If not monitored closely and interventions put into place, they can evolve into clinical eating disorders.

Table 1 Prevalence of Eating Disorders in Boys and Girls[1]

Clinical Eating Disorder	Prevalence in Females	Prevalence in Males
Anorexia nervosa	4%	0.3%
Bulimia nervosa	3%	1%
Binge eating disorder	3.5%	2%

Prevalence and Incidence of Eating Disorders or Disordered Eating in People With Diabetes

A study conducted by Anthony Winston showed that 7% of the participants with type 1 diabetes also had a diagnosed eating disorder, showing that that was also an increased risk for complications and elevated A1C levels.[2] The most common occurrence for eating disorders in type 2 diabetes was found to be binge eating disorders.[2] For people with diabetes and an eating disorder, many of them have disordered eating symptoms (restrictive eating, binging, and purging) and/or then manipulation of their medication (insulin restrictions) to manage their weight or blood glucose.[2]

Clinical Eating Disorders: Screening Tools and Identifying Them

There are several eating disorder screening tools that can be used with individuals to help detect and treat symptoms. Screening tools such as the Screen for Early Eating Disorder Signs (SEEDS) and the Eating Disorders: Informal Screening Questions are tools used in clinical eating disorder settings and can be found in ADCES's *The Art and Science of Diabetes Care and Education*[4] and the Health Partners Institute website on their International Diabetes Center page for a printable copy.[5,6] For reference, they are in Table 2 and Table 3 as well. Use of these screening tools can help clinical diabetes professionals on the care team identify and refer people with diabetes to the right support for eating disorders. For people with diabetes who may have an eating disorder, signs to focus on include blood glucose mismanagement, insulin mismanagement, or other medication mismanagement, which seem to be happening at higher rates. Insulin and other medications can cause weight gain, and if a person with diabetes, especially type 2, is concerned about their weight, manipulation of

Table 2 Eating Disorders: Informal Screening Questions[4]

Question Type	Questions to Ask
Weight concerns	How do you feel about your weight? Do you think you are overweight or worry about becoming overweight? Do you avoid getting on the scale? Would you weigh yourself in front of others? What is your ideal body weight?
Body image concerns	How do you feel about your appearance? Shape? Body size?
Binge eating	Are there certain foods you try to totally avoid eating? (Ask for details.) How often do you binge eat? (May need to define.) Describe your last binge episode. Do you ever feel as though you cannot manage your eating?
Compensatory behaviors	Have you ever induced vomiting or taken laxatives, diuretics, or enemas to lose weight? Have you ever reduced or skipped an insulin dose for weight purposes? Do you exercise regularly? (Ask for details.)
Weight history	What was your lowest and highest adult weight? (Ask about weight during adolescence when appropriate.) At what weight are you happiest? Have you experienced any rapid weight changes? (Ask for details.)
Unusual eating behaviors	Are you uncomfortable eating in front of others? Do you have any eating habits your friends or family have told you were unusual?

the way they take their medication can happen to try and remain weight neutral. Diabetes health care professionals should consider disordered eating symptoms when evaluating patient needs regarding fears of weight gain or increasing negative body image. In the program where I work, I do utilize these screening tools at the time of the consult and am aware of the possible issues when discussing with the team member who identified the potential symptoms for disordered eating.

Disordered Eating and Clinical Eating Disorders for People With Diabetes

Diabulimia, diarexia, and orthorexia are not recognized by the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* but are utilized in the diabetes health care community to understand specific symptoms for people with diabetes and eating disorders. There are several clinical eating disorders that are specific to people with diabetes, but the four most common ones are Diabulimia, Diarexia, Orthorexia, and Binge Eating Disorder. Table 4 references these diagnoses and the clinical symptoms. Diabulimia is the intentional manipulation of insulin doses for the purpose of weight loss or weight management, and complications can include severe hyperglycemia, increase in A1C, and diabetes-related ketoacidosis.[7] Diarexia is found in people with diabetes who have restrictive eating of food for the purpose of trying to maintain blood glucose control.[1] People with diarexia may excessively limit food intake, which can lead to severe malnutrition, hypoglycemia, neuropathy, retinopathy, renal damage, and poor metabolic management.[1] Orthorexia is defined as an obsession with healthy eating in the pursuit of optimal health.[8] This can trigger obsessive thoughts and behaviors and over time, can grow to be a severe health problem. Exaggerated food intake restriction and removing specific food groups are symptoms that can lead to malnutrition, hormonal imbalances, and general fatigue and weakness. Binge eating disorder is when a person has extreme amounts of food in 1 sitting, eating past the point of feeling full, which can lead to feeling sick or vomiting.[9] This can also include feelings of shame or guilt associated as an emotion felt after the binge episode. The population that this diagnosis is found in the most is our patients with type 2 diabetes, but it has been seen in patients with type 1 as well.[1] Negative feelings about themselves, their diabetes and how they manage it, and their bodies can happen, and with appropriate mental health intervention, they can be managed and treated.

Treatment and Education of Eating Disorders in People With Diabetes

A comprehensive multidisciplinary approach to treatment is a key part of helping people with diabetes have healthy eating habits and healthy views of food and their body. That approach can include psychotherapy, medical management, medical nutrition therapy, and diabetes education. Cognitive behavioral therapy (CBT), dialectical behavior therapy, and interpersonal therapy are

Table 3 Screens for Early Eating Disorder Signs (SEEDS)[4,5]

These questions ask about you, your life and your health. Please read each question carefully and answer honestly. Mark your answer by selecting from the the options.							
Questions							
1. How do you usually feel?	Very Sad O_7	O_6	O_5	O_4	O_3	O_2	Very Happy O_1
2. How would your friends describe you?	Grumpy O_7	O_6	O_5	O_4	O_3	O_2	Cheerful O_1
3. How often do you compare how you look to those around you?	All the time O_7	O_6	O_5	O_4	O_3	O_2	Not at all O_1
4. How well do you fit in with your friends?	Not very well O_7	O_6	O_5	O_4	O_3	O_2	Very Well O_1
5. How often do you feel in control of your life?	Never O_7	O_6	O_5	O_4	O_3	O_2	Always O_1
6. How satisfied are you with how you look?	Very Unsatisfied O_7	O_6	O_5	O_4	O_3	O_2	Satisfied O_1
7. How satisfying is your life?	Very Unsatisfied O_7	O_6	O_5	O_4	O_3	O_2	Satisfied O_1
8. How well do you handle your feelings?	Poorly O_7	O_6	O_5	O_4	O_3	O_2	Very Well O_1
9. How would your family members describe your mood most of the time?	Grumpy O_7	O_6	O_5	O_4	O_3	O_2	Cheerful O_1
10. How often do you feel your life is valuable?	Never O_7	O_6	O_5	O_4	O_3	O_2	Always O_1
11. How well do you manage your stress?	Poorly O_7	O_6	O_5	O_4	O_3	O_2	Very Well O_1
12. How often do you think about your body shape and size?	All the time O_7	O_6	O_5	O_4	O_3	O_2	Not at all O_1
13. How do you describe your mood?	Grumpy O_7	O_6	O_5	O_4	O_3	O_2	Cheerful O_1
14. How satisfied are you with your body shape?	Very dissatisfied O_7	O_6	O_5	O_4	O_3	O_2	Very satisfied O_1
15. How satisfied are you with your body size?	Very dissatisfied O_7	O_6	O_5	O_4	O_3	O_2	Very satisfied O_1
16. How do you describe your moods?	Up and Down O_7	O_6	O_5	O_4	O_3	O_2	Steady O_1
17. How much do you think you matter to your family?	Not at all O_7	O_6	O_5	O_4	O_3	O_2	Very much O_1
18. How do you feel when others around you talk about body shape and size?	Uncomfortable O_7	O_6	O_5	O_4	O_3	O_2	Comfortable O_1
19. How much do you think you matter to your friends?	Not at all O_7	O_6	O_5	O_4	O_3	O_2	Very much O_1
20. How often do you think you meet the expectations your family has for you?	Never O_7	O_6	O_5	O_4	O_3	O_2	Always O_1

strong mental health treatment modalities to help people with diabetes have a healthier relationship with food and their bodies.[10] It has been shown that the CBT modality can reduce the frequency of binge episodes and restriction episodes and promote healthier thoughts on glycemic management.[10]

The process for treatment generally includes a

consult with their medical provider who identifies the symptoms of disordered eating and works to make a consult to a mental health provider and/or a dietitian that specializes in diabetes and disordered eating. Most patients with disordered eating or a clinical eating disorder need both mental health counseling treatment and nutrition counseling because these diseases and symptoms are twofold in both a psychological piece and the possibility of malnutrition. People with diabetes also have an extra element to their disordered eating because their disease process, treatment, and management are very heavily focused on what they eat, how often, and how to manage that with their most important numbers (blood glucose, A1C, and blood pressure). This can trigger many people with diabetes to form anxiety and stress around what they eat, when, how much, and how to manage their medication intake based on that, leading to people to try and find easier ways or shortcuts with managing their disease. For many with diabetes, this disease feels very internal when something "goes wrong," leading to diabetes distress and in some, disordered eating.

Clinical Practice Pearls

I am lucky to be a part of a team of comprehensive clinical professionals who work with patients to manage not only obesity but also other medical conditions. The clinic for obesity medicine consists of 2 bariatricians, 2 obesity medicine nurse practitioners, 1 obesity medicine dietitian (RDN), 1 obesity medicine clinical pharmacist, 1 exercise physiologist, and myself, one of the obesity medicine behavior health specialists. We work together to provide medical management for weight loss, nutrition counseling and medical nutrition therapy, exercise consults, health behavior modification, continuous glucose monitoring, GLP-1 management, and diabetes self-management education and support (DSMES) for all patients, regardless of their type of diabetes. We have a plan to help work with the patient on these needs and other disciplines, such as their OB/GYN, their primary care provider, or even their endocrinologist.

More specifically, on this team, I provide health behavior assessments and help to manage the needed health behavior changes with emotional and stress eating, staying on track with how they are eating or managing their health behaviors, in addition to DSMES. I also conduct disordered eating and eating disorder clinical evaluations and refer to appropriate levels of care for eating disorder treatment. My role in this includes education to patients regarding eating disorders and disordered eating symptoms, especially for patients with diabetes. When a consult comes in, I complete a detailed clinical interview, reviewing trauma history, mental health history, and substance use history, and then examine their relationship with food. I examine their medications and how they take them as well as their eating habits on a daily basis. I use the Clinical Impairment Assessment Questionnaire[11] and the Eating Questionnaire EDE-Q 6.0[12] tools to help with understanding the needs of the patient and make an appropriate referral for further treatment. Working in a bariatrics and obesity medicine clinic puts me in a position to further educate our patients with diabetes and prediabetes in our program, other providers working in our program, and other behavioral health professionals. Eating disorders and disordered eating in the field of diabetes can

Table 4 Diabetes-Specific Eating Disorders From the National Alliance for Eating Disorders[7]

Clinical Eating Disorder	Symptoms
Diabulimia	Intentional manipulation of insulin for the purposes of weight loss or weight management. Eating large portions of food and then purposeful induced vomiting or purging for the purposes of weight loss or weight management.
Diarexia	Excessive limitation of food or calories in one's diet for the purposes of prevention of weight gain. There is a negative view of one's body and generally low self-esteem.
Orthorexia	An obsession with extreme healthy eating with the intention of optimal health. Patients usually have extreme negative thoughts and are obsessed with their eating, health behaviors, and habits.
Binge eating disorder	Excessive intake of food or calories where a person eats past the point of being full, has nausea or vomiting, often dissociating while doing it, and then feels guilt after the episode.

Table 5 Clinical Team Program Workflow

Patient Flow Process in the Obesity Medicine Clinic Where I Work	Descriptions
Step 1	Patients first attend the Nutrition 101 class, a general education on nutrition and weight loss.
Step 2	Patients are then able to meet with either the bariatricians or the obesity medicine nurse practitioners for an initial consult, who assess their medical needs for weight loss with a medication option and/or the personalized program that consists of a one-to-one consult with the obesity medicine dietitian, a consult with the obesity medicine exercise physiologist, and the obesity medicine behavior specialist.
Step 3	If the bariatrician or the obesity medicine nurse practitioners see disordered eating symptoms, the consult for an evaluation goes in for an obesity medicine behavior specialist to meet with them with that information. The nutrition and behavior health consults do not happen in any specific order, so if in a nutrition consult she notices any disordered eating symptoms, she puts in a consult with the behavior specialist to have a further full assessment. Our clinical pharmacist, as another diabetes educator, also makes consults to the behavior specialist for further evaluation and recommendations.
Step 4	Once both nutrition and behavioral health consults have been completed, we work together to develop a plan to manage the symptoms, whether that plan includes our team or a higher level of care, such as a residential treatment center, hospitalization, or an outpatient program, such as partial hospitalization program, intensive outpatient program, or outpatient clinic for eating disorders.

Table 6 Diabetes, Eating Disorders, and Clinical Treatment: Clinic-Specific Layout

Diabetes Type and Eating Disorders in a Bariatrics Clinic (Binge Eating Disorder, Diabulimia, and Diaorexia)	Clinical Team Members for Treatment	Types of Treatment
Type 1 or 2 diabetes/LADA	1. Bariatrician/obesity medicine APP and clinical pharmacist 2. Registered dietitian 3. Behavioral health specialist 4. Exercise physiologist	1. Medication management and adjustment (both AOMs and diabetes) 2. Medical nutrition therapy and diet management 3. Eating disorder evaluation and treatment or referral to treatment 4. Exercise management and follow up for appropriate healthy exercises Note that we refer out for treatment needs that are clinically, culturally, and/or geographically appropriate.
Prediabetes	1. Bariatrician/obesity medicine APP 2. Registered dietitian 3.Behavioral health specialist 4. Exercise physiologist	1. Medication management and adjustment (both AOMs and diabetes) 2. Medical nutrition therapy and diet management 3. Eating disorder evaluation and treatment or referral to treatment 4. Exercise management and follow up for appropriate healthy exercises Note that we refer out for treatment needs that are clinically, culturally, and/or geographically appropriate.
Gestational diabetes	All above obesity medicine treatment, and then treatment is managed by the obstetrics team, with our help as needed. Once postpartum, care is passed back to our team.	All above treatment; then from the obstetrics team, medication management based on pregnancy and diet and exercise adjustments for pregnancy. Reevaluation for treatment once postpartum by the obesity medicine team.

Abbreviations: AOMs, ; APP, ; LADA, .[AQ: Please provide expansions for "AOMs," "APP," and "LADA."]

be complex because it entails not only eating habits but also whether there is medication and lifestyle habit mismanagement in an effort to manage weight gain or loss. In Table 5, I show how my clinic and the multidisciplinary team I am part of work together to support the person with diabetes in their treatment needs, whether internal clinical interventions or external referrals to an appropriate treatment. This is something that could be adapted to other clinic settings as well. Table 6 shows what we would do for each type of diabetes that may come into our clinic for a weight loss consult.

With the diabetes care team of professionals working together with the person with diabetes and their support system, we can help to support people with diabetes in their health and eating to ensure it is a positive relationship with food overall. We want people to still experience the joy of eating and not feel deprived or feel that they cannot eat what they enjoy because of their diabetes. With a knowledgeable care team, we can help prevent eating disorders and disordered eating in our patients or treat those who already have a diagnosis. ■

REFERENCES

1. Dziewa M, Banka B, Herbert M, Piatkowska-Chmiel I. Eating disorders and diabetes: facing the dual challenge. *Nutrients.* 2023;15:3955. doi:10.3390/nu15183955

2. Winston AP. Eating disorders and diabetes. *Curr Diabetes Rep.* 2020;20(8):32. doi:10.1007/s11892-020-01320-

3. Wagner G, Karwautz A. Eating disorders in adolescents with type 1 diabetes mellitus. *Wolters Kluwer Health.* 2020;33(6):602-610. doi:10.1097/YCO.0000000000000650

4. Association of Diabetes Care & Education Specialists. *The Art and Science of Diabetes Care and Education.* 6th ed. 2023.

5. Health Partners Institute International Diabetes Center. Screen for Early Eating Disorder Signs (SEEDS). 2025. Accessed August 26, 2025. https://www.healthpartners.com/institute/centers/international-diabetes-center/idc-clinical-resources/

6. Powers MA, Richter S, Ackard D, Craft C. Development and validation of the Screen for Early Eating Disorder Signs (SEEDS) in persons with type 1 diabetes. *Eat Discord.* 2016;24(3):271-288.

7. National Alliance for Eating Disorders. What is diabulimia? 2023. Accessed August 26, 2025. https://www.alliance-foreatingdisorders.com/what-exactly-is-diabulimia/

8. Altun HK, Ozyildirim C, Koc S, et al. The factors associated with orthorexia nervosa in type 2 diabetes and their effect on diabetes self-management scores. *Eating Weight Discord.* 2023;28(1):22. doi:10.1007/s40519-023-01552-5

9. Giel KE, Bulik CM, Fernandez-Aranda F, et al. Binge eating disorder. *Nature Reviews Disease Primers.* 2022;8:16. doi:10.1038/s41572-022-00344-y

10. Oldham-Cooper R, Semple C. Prevention and early help for eating disorders in young people with type 1 diabetes. *Clini Child Psychol Psychiatry.* 2021;26(3):656-668. doi:10.1177/1359104521994172

11. Bohn K, Fairburn CG. 2008. Clinical Impairment Assessment Questionnaire (CIA 3.0). In: Fairburn CG, ed. *Cognitive Behavior Therapy and Eating Disorders.* Guilford Press; 2008. https://novopsych.com/wp-content/uploads/2023/02/Clinical-Impairment-Assessment-CIA-eating-disorder-pdf.pdf

12. Fairburn CG, Beglin S. Eating Disorder Examination Questionnaire (EDE-Q 6.0). In: Fairburn CG, ed. *Cognitive Behavior Therapy and Eating* Disorders. Guilford Press; 2008:309-313.

ADCES® Association of Diabetes Care & Education Specialists

Apply for DSMES PROGRAM ACCREDITATION and Start Receiving Reimbursement for Your Services.

ADCES Diabetes Education Accreditation Program (DEAP)

As one of two national accrediting organizations for Medicare, ADCES® offers full support to healthcare professionals who provide diabetes self-management education and support (DSMES) and want to receive reimbursement for diabetes self-management training (DSMT), the Medicare benefit available to all Medicare beneficiaries with a diagnosis of diabetes.

Why Choose ADCES?

When your DSMES program is accredited by ADCES, you're immersed in a community of peers and experienced staff who will support you every step of the way on your accreditation journey. Other benefits include:

- Complimentary ADCES Membership
- Accreditation Resources
- Practical Guidance
- Weekly Office Hours
- Monthly Coffee Breaks
- Complimentary Webinars
- Personalized Reimbursement Help

Application fees begin at $1,100 for all program types. To learn more about the DEAP Standards, Application Toolkit and Reimbursement Requirements, visit **adces.org/accreditation**.

Scan the QR Code for the DEAP Standards, Application Toolkit and Reimbursement Requirements.

ADCES DEAP DIABETES EDUCATION ACCREDITATION PROGRAM®

Navigating the Crossroads of Diabetes and Chronic Opioid Therapy

Differentiating Hypoglycemia from Opioid Withdrawal

BRIAN BURROUGHS, MSPAS, PA-C, BC-ADM, CDCES,

MATTHEW WEISEMAN, MMSC, PA-C, AND

ANGIE CLINTON, MS, RDN, LD, CDCES

As the management of diabetes mellitus and chronic opioid therapy becomes increasingly common, particularly in patients with painful diabetic neuropathy, diabetes care and education specialists (DCESs) play a crucial role in navigating the complexities of these concurrent treatments. Both hypoglycemia and opioid withdrawal can present with similar autonomic symptoms, such as sweating, anxiety, and tachycardia, complicating diagnosis.[1,2] Mismanagement of either condition can result in significant morbidity.[1-3] Understanding the pathophysiological processes of hypoglycemia and opioid withdrawal and effective management strategies is essential for DCESs to provide comprehensive care.[4-8]

Pathophysiology

Hypoglycemia in Diabetes

Hypoglycemia typically results from a mismatch between insulin or insulin secretagogues and carbohydrate intake or utilization.[1] It is particularly concerning in individuals with long-standing type 1 diabetes or those with tightly controlled type 2 diabetes.[1] Repeated episodes may result in hypoglycemia-associated autonomic failure (HAAF), characterized by impaired awareness of low blood sugar and diminished counterregulatory hormone responses, such as cortisol and epinephrine.[1] HAAF increases the risk of severe hypoglycemia, particularly in older adults and those on intensive insulin regimens.[1]

Opioid Withdrawal

Chronic opioid use leads to neuroadaptive changes in mu-opioid receptor pathways.[2] When opioid use is reduced or stopped, opioid withdrawal syndrome can emerge, marked by a hyperadrenergic state.[2] Symptoms include agitation, tachycardia, nausea, diarrhea, and sweating due to increased sympathetic nervous system activity and reduced dopaminergic tone.[2]

Clinical Presentation

Given the overlap in autonomic symptoms, distinguishing hypoglycemia from opioid withdrawal is challenging[2] (see Table 1). Symptoms common to both include diaphoresis, tremors, anxiety, and palpitations.[1,2] However, hypoglycemia more often presents with confusion, visual disturbances, seizures, and loss of consciousness.[1] Opioid withdrawal may include myalgias, yawning, lacrimation, rhinorrhea, piloerection, and gastrointestinal symptoms, such as vomiting or diarrhea.[2] Prompt blood glucose testing is essential for patients on insulin or sulfonylureas.[16]

Table 1 Comparison of Symptoms: Hypoglycemia Versus Opioid Withdrawal

Symptom	Hypoglycemia	Opioid Withdrawal
Diaphoresis	✓	✓
Tachycardia	✓	✓
Tremors	✓	✓
Anxiety	✓	✓
Confusion	✓	
Visual disturbances	✓	
Seizures	✓	
Loss of consciousness	✓	
Myalgias		✓
Yawning		✓
Lacrimation		✓
Rhinorrhea		✓
Piloerection		✓
Vomiting		✓
Diarrhea		✓

Opioid-Induced Hypoglycemia

Certain opioids, including methadone and tramadol, may contribute to hypoglycemia via mechanisms such as enhanced insulin secretion and increased peripheral glucose uptake.[3] Patients already at risk for glucose instability, such as those with diabetes, are particularly vulnerable.[3] A case series demonstrated recurrent hypoglycemia associated with methadone, which resolved upon discontinuation.[3] DCESs should collaborate with

providers to monitor glucose levels regularly in patients receiving opioids like methadone.[3]

Role of DCES in Implementing Diabetes Self-Management Education and Support for Hypoglycemia Monitoring and Management

DCESs are central to delivering diabetes self-management education and support (DSMES), which is endorsed by the American Diabetes Association (ADA), the Endocrine Society, and the American Association of Clinical Endocrinology as foundational to diabetes care, especially for individuals at risk of hypoglycemia or managing comorbidities such as chronic opioid use.[4-8] DSMES equips patients to recognize and respond to hypoglycemia and to distinguish it from conditions with similar symptoms, including opioid withdrawal[4-8] (see Table 2).

The ADA and Endocrine Society recommend DSMES at diagnosis, annually, during treatment changes, and at transitions in care.[5,7] For patients on chronic opioid therapy, DCESs are uniquely positioned to help differentiate hypoglycemia from opioid withdrawal, reduce the risk of severe hypoglycemia, and improve outcomes.[4-8]

Table 2 DSMES Components for Patients on Chronic Opioids at Risk of Hypoglycemia

DSMES Component	Description
Hypoglycemia symptom recognition	Training patients to identify cues of hypoglycemia (eg, physical symptoms, mood changes, food intake, activity) and to use tools such as self-monitoring of blood glucose and CGMs[6]
CGM education	Providing individualized education on CGMs, which are especially valuable for those with hypoglycemia unawareness or frequent episodes and for differentiating hypoglycemia from opioid withdrawal in real time[6]
Collaborative goal setting	Engaging in collaborative goal setting, problem-solving, and interdisciplinary care planning to integrate hypoglycemia management into the broader care plan[5,7]
Addressing barriers	Addressing barriers to self-management, including health literacy and access to technology, and offering DSMES via in-person, telehealth, or digital platforms[5,7]
Reassessment and adjustment	Reassessing and adjusting the DSMES plan at critical junctures, such as medication changes, unexplained hypoglycemia, or unmet goals[5,7]

Abbreviations: CGM, continuous glucose monitor; DSMES, diabetes self-management education and support.

Management Strategies

Differential Diagnosis

Timely differentiation is critical. DCESs should perform glucose checks at symptom onset and gather opioid use history, including recent dosage changes.[2] Observing for withdrawal-specific signs, such as yawning or gastrointestinal distress, can support diagnosis.[2]

Medication Management

Opioids may be used for painful diabetic neuropathy when first-line therapies are ineffective.[4] Buprenorphine, a partial agonist, is safer than full-agonist opioids and may reduce misuse risk.[4] The Opioid Risk Tool can guide decision-making and risk assessment.[5] DCESs should also educate patients about the risks of opioid dependency and advocate for nonopioid alternatives when appropriate.[5]

Monitoring and Risk Mitigation

DCESs should use validated screening tools, such as the Drug Abuse Screening Tool and Current Opioid Misuse Measure, to identify patients at risk of misuse or addiction.[5] Guidelines from the Centers for Disease Control and Prevention recommend evaluating the risks and benefits of opioid therapy regularly, using nonopioid treatments when feasible, and reassessing pain management effectiveness.[5]

Conclusion

The management of diabetes in patients on chronic opioid therapy is complex, particularly due to symptom overlap between hypoglycemia and opioid withdrawal. DCESs play a pivotal role by leading DSMES, supporting accurate symptom differentiation, and coordinating patient-centered, evidence-based care. Through education, monitoring, and interdisciplinary collaboration, DCESs help reduce risks, avoid misdiagnosis, and improve quality of life for people living with diabetes and chronic pain[4-8]. ■

Author Contributions

Brian Burroughs conceptualized the article and wrote the majority of the manuscript,

including sections on diabetes pathophysiology, management, and diabetes self-management education and support. Matthew Weisemann reviewed the manuscript and contributed expert input on opioid pathophysiology and management. Angie Clinton reviewed the manuscript and provided expert input on nutrition, education, and lifestyle management.

Declaration of Conflicting Interests
None.

Funding
None.

Guarantor Statement
Brian Burroughs serves as the guarantor of this work and takes responsibility for the integrity of the content, including the accuracy of the data and analysis presented.

Brian Burroughs *https://orcid.org/0000-0003-4529-018X*

REFERENCES

1. Rickels MR. Hypoglycemia-associated autonomic failure, counterregulatory responses, and therapeutic options in type 1 diabetes. *Ann N Y Acad Sci*. 2019;1454(1):68-79. doi:10.1111/nyas.14214

2. Kosten TR, Baxter LE. Effective management of opioid withdrawal symptoms: a gateway to opioid dependence treatment. *Am J Addict*. 2019;28(2):55-62. doi:10.1111/ajad.12862

3. Malboosbaf R, Hatami N, Maghsoomi Z. Methadone-induced hypoglycemia: a case report. *J Diabetes Investig*. 2022;14(1):145-146. doi:10.1111/jdi.13919

4. Srinivasan A, Dutta P, Bansal D, et al. Efficacy and safety of low-dose naltrexone in painful diabetic neuropathy: a randomized, double-blind, active-control, crossover clinical trial. *J Diabetes*. 2021;13(10):770-778. doi:10.1111/1753-0407.13202

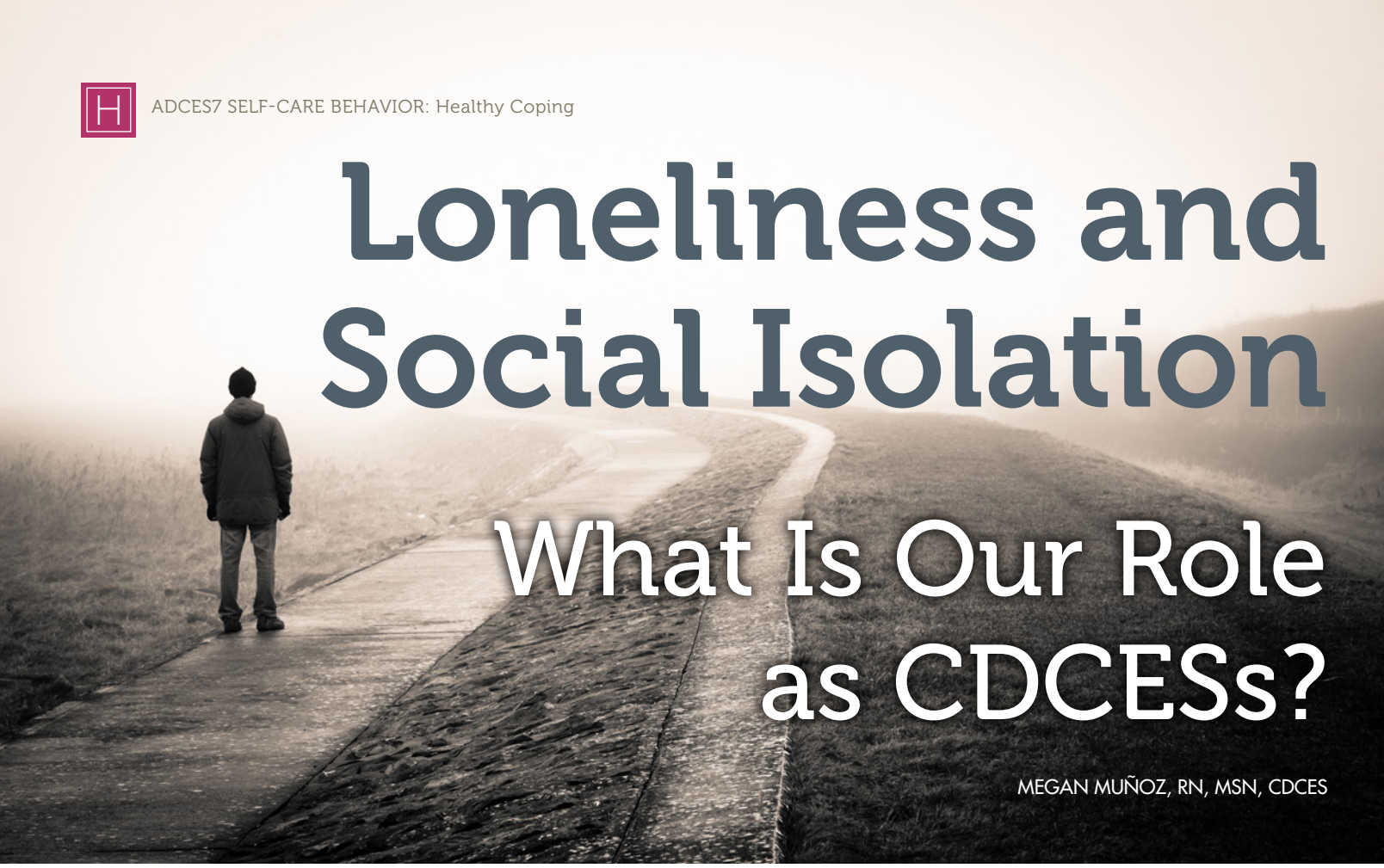
5. Butler SF, Budman SH, Fernandez KC, et al. Development and validation of the Current Opioid Misuse Measure. *Pain*. 2007;130(1-2):144-156. doi:10.1016/j.pain.2007.01.014

6. Powers MA, Bardsley JK, Cypress M, et al. Diabetes self-management education and support in adults with type 2 diabetes: a consensus report. *Diabetes Care*. 2020;43(7):1636-1649. doi:10.2337/dci20-0023

7. McCall AL, Lieb DC, Gianchandani R, et al. Management of individuals with diabetes at high risk for hypoglycemia: An Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab*. 2023;108(3):529-562. doi:10.1210/clinem/dgac596

8. Diabetes Care. Standards of Care in Diabetes—2025: facilitating positive health behaviors and glycemic goals. *Diabetes Care*. 2025;48(suppl 1):S86-S145. doi:10.2337/dc25-S005

Loneliness and Social Isolation



What Is Our Role as CDCESs?

MEGAN MUÑOZ, RN, MSN, CDCES

Social isolation and loneliness have become pervasive in industrialized countries, including the United States.[1,2] Reports indicate over 50% of Americans in 2024 felt lonely and that an estimated 25% of older adults are socially isolated.[1,3] The former US Surgeon General, Dr Vivek Murth, has repeatedly stressed the dangers of loneliness and social isolation on health and productivity.[2] The World Health Organization considers social disconnection and loneliness to be primary drivers for depression, anxiety, and chronic disease.[1]

Social Isolation	Loneliness
An objective measurement, usually defined by things that can be quantified such as: - the number of social contacts and frequency of using those contacts - the number and frequency of social events attended - marital status - the number of household members[1,2,5] Social isolation is the opposite of social connectedness.	A subjective measurement, requiring insight about one's own experience. It is the distressing sensation of being socially isolated, regardless of one's social connections.[1,2,5] It's important to note that choosing to be alone or having "alone time" is not the same as being lonely.

Figure 1

Unfortunately, social isolation and loneliness affect persons with diabetes (PWDs) to a higher degree than their peers.[4] These negatively impact diabetes complications and self-care behaviors critical to diabetes management.[1,2,4,5] In addition, social disconnection and loneliness are risk factors for the development of type 2 diabetes (T2D) itself.[5] The goal of this article is to help define social isolation and loneliness, explore their impact on health and self-care behaviors, and discuss potential interventions to support those living with diabetes.

Defining Social Isolation and Loneliness

Although social isolation and loneliness are often studied in tandem, they are not the same. One is more objectively measured, and the other relies on one's perception. For definitions of these terms, see Figure 1. It is important to note that although studies separate social isolation from loneliness, they do not always use a standardized way of measuring these factors. Thus, measurement of social isolation and/or loneliness can vary study to study.

Negative Influences of Social Isolation and Loneliness on Health

Although the COVID-19 pandemic may have triggered more discussion about social isolation, we have decades of research to show just how damaging it can be to health.[2,5,6] Poorer health habits, higher rates of chronic metabolic diseases (eg, cardiovascular disease and diabetes), and increased anxiety, depression, and dementia all have links to social isolation and/or loneliness.[2,5,6]

The 2023 Surgeon General's report, "Our Epidemic of Loneliness and Isolation," acknowledges social isolation and loneliness as drivers of stress and chronic inflammation.[2] It is noted that these influences have similar health outcomes to excessive smoking, alcohol use, or physical inactivity. Dr Vivek Muth, author of the report, refers to social connection as being "as essential to our long-term survival as food [and] water."[2]

ADCES7 Diabetes Self-Care Behaviors Through the Social Connectedness Lens

Positive social connections can help PWDs increase their self-care behaviors (eg, smoking cessation or increased physical activity), whereas the lack of support can create negative impacts on diabetes outcomes and health behaviors.[2,5] It is critical that certified diabetes care and education specialists (CDCESs) understand the influence of social isolation and/or loneliness on a PWD's ability to manage their condition. In the following, the ADCES7 is used as a guide to explore these influences.

Healthy Eating and Being Active

Food has cultural and social constructs that should not be discounted. Living and eating with others increases the quality and variety of food one consumes while also influencing food preparation and access. Loneliness can impact bingeing or restriction, either increasing the desire for higher caloric, tastier foods or creating a more rigid dietary pattern.[7,8] Overall, both social isolation and loneliness have been linked to poorer dietary intake.[2,5,7,8]

> Social connection is a fundamental human need, as essential to survival as food, water, and shelter.
>
> –Dr. Vivek Murth, former US Surgeon General

Physical activity offers a vital role in health—influencing things such as metabolic function, muscle mass, bone density, balance, and more. Many studies point to reduced physical activity in those who are lonelier and more isolated.[2,5]

Taking Medication

Cardiometabolic medications are critical for managing T2D, lipids, and blood pressure, which, in turn, reduces the risk of diabetes complications. Similar to healthy eating patterns, social connectedness can assist in one's ability to understand medication instructions and obtain, organize, and use medications as prescribed.[2,9,10] Medication use inconsistencies are more likely for those who are socially isolated.[2,9,10]

Monitoring and Reducing Risks

Social isolation and loneliness, independent of diabetes, can increase cardiovascular disease risks. Heart disease and stroke are nearly 30% higher, and mortality risk almost double in those who are more isolated.[2,6] Similarly, people who are social isolated and living with chronic kidney disease (CKD) see accelerations in the development of both cardiovascular disease or mortality.[11] CKD and microvascular complications are associated with social isolation or loneliness to similar degrees as smoking, hypertension, and physical inactivity.[12]

Actions to monitor and/or reduce diabetes

> CKD and microvascular complications are associated with social isolation/ loneliness to similar degrees as smoking, hypertension, and physical inactivity.

complications can be negatively impacted by these social factors. In larger, more longitudinal studies, smoking was more likely and cessation more difficult for lonely individuals.[2,5,13] Poorer self-care routines and lower prioritization of diabetes care were evident in other studies looking at social connectedness and health behaviors.[2,5,9,13]

Interestingly, social isolation and loneliness have mixed results on health care utilization. Social isolation may increase hospitalizations and hospital stays and reduce attendance at posthospitalization follow-up, whereas loneliness increases primary care visits.[14,15]

Problem Solving and Healthy Coping

PWDs make significantly more daily health decisions than those without diabetes. The ability to navigate these and everyday life stressors depends on a number of factors: sleep habits, eating and exercise routines, glucose trends, psychological health, and social connectedness and/or loneliness.[3,14,16-18]

Studies show interruptions to relationships and support systems due to trauma, chronic stressors, or mental health struggles increase the risk of T2D.[2,16,17] As mentioned previously, impacts on metabolic and psychological health and one's ability to engage in necessary health behaviors are evident in other studies.[2,5,9,12,18]

The CDCES's Role in Addressing Social Isolation and Loneliness

There are many ways CDCESs can expand care recommendations through the lens of social connectedness. A great place to start is by simply asking oneself, "How are my current recommendations going to impact this person socially?" and "How can I modify my recommendations to be more socially inclusive?" A few other ideas are listed in the following.

1. **Use screenings to assess for gaps in social support.** The Diabetes Distress Assessment System is a great place to start when assessing social connectedness.[19] Higher scores on interpersonal areas can signify the PWD is struggling with social connectedness. There are also tools like the UCLA Loneliness Scale or the Lubben Social Network Scale.
2. **Encourage and include support systems (family, friends, etc) to join in diabetes training.** For adults with diabetes, support increases self-care actions and self-efficacy.[20] Ensure consult rooms and classrooms are large enough to accommodate support persons. Help the PWD and their support systems navigate common points of relational friction. If your program provides group classes, create avenues for participants to stay connected afterward. This could be through a drop-in program, a private group social media page, or an exchange of numbers and emails. Encourage the PWD to utilize diabetes support groups or join the diabetes online community (DOC).
3. **Help people embrace their communities and find purpose.** Social connectedness often gives people a sense of meaning in the world. A sense of purpose increases positive health behaviors.[21] Most people have a special interest or skill set that can be of service to others. Encourage PWDs to join clubs, councils, churches, or city programs. Communities often need help with things such as litter clean up, meal or prescription delivery, or reading program support for young kids. If someone is homebound, they may be able to foster a shelter animal, help with social media sites, or manage paperwork for volunteer organizations.
4. **Focus self-care recommendations on connectedness.** Find ways diabetes self-care behaviors can be tailored through social connection. For example, modify physical activity recommendations to include walking with a coworker, biking with one's child, or joining group exercise classes. Consider nutrition recommendations that reduce stress in social settings, such as the diabetes plate method or intuitive eating.

Think outside the box: Consider hosting a community meal from a community garden.

5. **Embrace the nuanced.** Managing diabetes is not all or nothing; there is a social cost to rigid expectations of those living with diabetes. The middle ground, in which someone with diabetes can manage it well and have a high level of pleasure, is important to explore. Avoid either/or language, which may increase isolation through shame, guilt, and stigma.[22] Help people break away from black and white thinking—such as "good and bad" food or "good and bad" glucose levels.[22]

Social connectedness is an essential and undeniable part of health. For PWDs, social isolation and loneliness are drivers for both the development of the disease and long-term health outcomes. The United States is struggling with increased rates of social isolation. However, the diabetes population is harder hit, with higher rates of isolation and loneliness reported. Diabetes health, self-care behaviors, and complications are all impacted. Thus, it is imperative CDCESs incorporate both assessments and interventions for social connectedness into routine care. ■

REFERENCES

1. World Health Organization. From loneliness to social connection: charting a path to healthier societies: report of the WHO Commission on Social Connection. June 30, 2025. Accessed July 1, 2025. https://www.who.int/groups/commission-on-social-connection

2. Office of the Surgeon General, U.S. Department of Health and Human Services. Our epidemic of loneliness and isolation: the U.S. Surgeon General's advisory on the healing effects of social connection and community. 2023. Accessed July 1, 2025. https://www.hhs.gov/sites/default/files/surgeon-general-social-connection-advisory.pdf

3. The Cigna Group. Loneliness in America 2025. Accessed July 6, 2025. https://newsroom.thecignagroup.com/loneliness-in-america

4. Liang YY, Chen Y, Feng H, et al. Social isolation, loneliness and subsequent risk of major adverse cardiovascular events among individuals with type 2 diabetes mellitus. *Gen Psychiatr.* 2023;36:e101153. doi:10.1136/gpsych-2023-101153

5. Song Y, Zhang L, Liu Y, et al. Social isolation, loneliness, and incident type 2 diabetes mellitus: results from two large prospective cohorts in Europe and East Asia and mendelian randomization. *eClinicalMedicine.* 2023;64:102236. doi:10.1016/j.eclinm.2023.102236

6. Valtorta NK, Kanaan M, Gilbody S, Ronzi S, Hanratty B. Loneliness and social isolation as risk factors for coronary heart disease and stroke: systematic review and meta-analysis of longitudinal observational studies. *Heart.* 2016;102(13):1009-1016. doi:10.1136/heartjnl-2015-308790

7. Zhang X, Ravichandran S, Gee GC, et al. Social isolation, brain food cue processing, eating behaviors, and mental health symptoms. *JAMA Netw Open.* 2024;7(4):e244855. doi:10.1001/jamanetworkopen.2024.4855

8. Hanna K, Cross J, Nicholls A, Gallegos D. The association between loneliness or social isolation and food and eating behaviours: a scoping review. *Appetite.* 2023;191:107051. doi:10.1016/j.appet.2023.107051

9. Strom JL, Egede LE. The impact of social support on outcomes in adult patients with type 2 diabetes: a systematic review. *Curr Diab Rep.* 2012;12(6):769-781. doi:10.1007/s11892-012-0317-0

10. Lu J, Zhang N, Mao D, Wang Y, Wang X. How social isolation and loneliness effect medication adherence among elderly with chronic diseases: an integrated theory and validated cross-sectional study. *Arch Gerontol Geriatr.* 2020;90:104154. doi:10.1016/j.archger.2020.104154

11. Zeng X, Jiang Y, Liu Z, et al. Social isolation is associated with the acceleration of death and incident cardiovascular disease in adults with chronic kidney disease. *J Am Heart Assoc.* 2025;14(11):e038951. doi:10.1161/JAHA.124.038951

12. Liang YY, Chen Y, Feng H, et al. Social isolation, loneliness, and risk of microvascular complications among individuals with type 2 diabetes mellitus. *Am J Kidney Dis.* 2024;84(5):557-566.e1. doi:10.1016/j.ajkd.2024.08.039

13. Dyal SR, Valente TW. A systematic review of loneliness and smoking: small effects, big implications. *Subst Use Misuse.* 2015;50(13):1697-1716. doi:10.3109/10826084.2015.1027933

14. Cayenne NA, Jacobsohn GC, Jones CMC, et al. Association between social isolation and outpatient follow-up in older adults following emergency department discharge. *Arch Gerontol Geriatr.* 2021;93:104298. doi:10.1016/j.archger.2020.104298

15. Christiansen J, Pedersen SS, Andersen CM, Qualter P, Lund R, Lasgaard M. Loneliness, social isolation, and healthcare utilization in the general population. *Health Psychol.* 2023;42(2):63-72. doi:10.1037/hea0001247

16. Nelson CA, Scott RD, Bhutta ZA, Harris NB, Danese A, Samara M. Adversity in childhood is linked to mental and physical health throughout life. *BMJ.* 2020;371:m3048.

doi:10.1136/bmj.m3048

17. Kelly SJ, Ismail M. Stress and type 2 diabetes: a review of how stress contributes to the development of type 2 diabetes. *Annu Rev Public Health*. 2015;36:441-462. doi:10.1146/annurev-publhealth-031914-122921

18. Zhou J, Tang R, Wang X, Li X, Heianza Y, Qi L. Improvement of social isolation and loneliness and excess mortality risk in people with obesity. *JAMA Netw Open*. 2024;7(1):e2352824. doi:10.1001/jamanetworkopen.2023.52824

19. Diabetes Distress Assessment & Resource Center. For providers. Behavioral Diabetes Institute. Accessed August 10, 2025. https://diabetesdistress.org/for-providers/

20. Baig AA, Benitez A, Quinn MT, Burnet DL. Family interventions to improve diabetes outcomes for adults. *Ann N Y Acad Sci*. 2015;1353(1):89-112. doi:10.1111/nyas.12844

21. Kim ES, Shiba K, Boehm JK, Kubzansky LD. Sense of purpose in life and five health behaviors in older adults. *Prev Med*. 2020;139:106172. doi:10.1016/j.ypmed.2020.106172

22. Dickinson JK, Guzman SJ, Maryniuk MD, et al. The use of language in diabetes care and education. *Diabetes Care*. 2017;40(12):1790-1799. doi:10.2337/dci17-0041

Unleashing potential

Sage Campus

Sage Campus offers structured online courses that blend theory and practice, supporting all academic stages—from undergraduates to researchers aiming to publish. Our self-paced, instructor-led courses include Sage-quality content, videos, interactives, and assessments, helping users build critical skills and tackle complex issues.

Why Sage Campus?

- Master the essential skills needed to succeed in academic study, including critical thinking, navigating information, research and data science skills
- Supplement classes with high-quality resources in flipped classroom or asynchronous teaching
- Learn autonomously, building practical skills for study, research and the workplace
- Incorporate learning in your busy schedules with fully self-paced courses

Sign up for a free 30-day trial today

learningresources.sagepub.com/campus

Diabetes-Related Sensorineural Hearing Loss

The "Silent" Side Effect of Diabetes

ROBERT M. DISOGRA, AUD

Much has been written about diabetes-related retinopathy, its cause, progression, and impact on the quality of life on a person with diabetes (PWD). The same thing cannot be said about diabetes-related hearing loss. Awareness, testing, and management are just as important as identifying a visual impairment.

Approximately 7% of people with prediabetes already show signs of retinopathy.

A diabetes care and education specialist is the first professional a PWD will encounter after the diagnosis. When questioned about sensory issues, the answer to the question, "Do you have any problems with your hearing?," will usually be, "No."

There is a very simple and logical explanation as to why a PWD would deny hearing loss: Diabetes-related retinopathy can lead to a change in the person's quality of life, affect mobility, and create balance issues that could put a PWD at risk for a fall. Hearing loss or diabetes-related sensorineural hearing loss (DSNHL) does not affect mobility; however, problems with balance can be present even in the absence of hearing loss. Communication problems will occur as the loss progresses. But again, getting help for a hearing loss will take longer than getting help for a visual impairment.

Microangiopathy: How Diabetes Affects Hearing

Hearing loss from diabetes is usually the result of the microangiopathy in the cochlea vasculature. That is, the glucose in the blood builds up within the walls the cochlea (stria vascularis), thus damaging the capillaries and reducing blood. Because the stria vascularis can be 10 to 20 times thicker than usual in a PWD, hearing loss is likely to occur. These thicker vessel walls of the stria vascularis can lead to a sclerosis of the internal auditory artery. This reduction brings less oxygen to the inner ear hair cells, resulting in outer cell damage and subsequent loss in sound sensitivity (with or without tinnitus).

Hearing loss from diabetes does not appear as quickly as a diabetes-related visual impairment. But it is happening. DSNHL occurs in the cochlea and usually affects the high frequencies of speech. High-frequency losses affect the clarity of words. However, because the disease is systemic, hearing loss could occur in lower frequencies, too. Low

frequencies provide the loudness of speech.

Researchers noted that there are 2 types of (micro)angiopathy in the cochlea: direct and indirect. Direct angiopathy interferes with the blood supply to the cochlea by reducing transport through the thickened capillary walls. Indirect angiopathy occurs by reducing the blood flow of a narrow vasculature or by causing secondary degeneration of the eighth cranial nerve. This could impact cognition if the auditory pathway to the brain is affected.

Why Does Diabetes-related Retinopathy Get More Attention Than Diabetes-Related Sensorineural Hearing Loss?

There is a simple reason why DSNHL is not prioritized: Diabetes-related retinopathy will affect mobility and increase fall risk, whereas hearing loss does not impede mobility.

If you ask a PWD, "Do you have any problems with your hearing?," the answer will usually be, "No." Why? With sensorineural hearing loss (regardless of the etiology), the person can still "hear." But if you ask them, "How well do you understand words you are hearing?," you will/could get an entirely different answer. Table 1 lists some causes of hearing loss according to the National Institute on Aging.

Table 1 Causes of Hearing Loss

Age (presbycusis)
History of occupational or recreational noise exposure
Prescription or over-the-counter medication side effects
Family history of hearing loss/genetics
History of head trauma
Ear infections
Autoimmune inner ear disease (American Speech, Language, Hearing Association 2025)
Other chronic illnesses (DiSogra and Beck 2025)
Other neurological pathologies (ie, acoustic neuroma, etc)
Cerumen (ear wax) buildup
Ruptured ear drum

Symptoms of Hearing Loss

When asked, a person experiencing a mild degree of hearing loss will usually deny it: the first symptom of hearing loss. A person with hearing loss can still "hear," but the quality/clarity of what they hear is the real problem. Table 2 lists the common symptoms of hearing loss.

Hearing Loss Under 60 Years of Age and Over 60 Years of Age: The Diagnostic Dilemma

Hearing loss is twice as common in people who have diabetes as it is in people of the same age who do not. Even people with prediabetes (blood glucose levels higher than normal but not high enough yet to have type 2 diabetes) have a 30% higher rate of hearing loss than people with normal blood glucose levels.

Age-related hearing loss has been researched and documented over the decades. In clinical practice, audiologists are sometimes faced with a patient whose medical history does not fall in line with the audiometric data: high-frequency sensorineural hearing loss (HF SNHL) at an unexpected younger age (<60 years) than what would be expected with an older patient (>60 years). Sometimes, we cannot fully explain the etiology of the loss when the patient's history is unremarkable.

Table 2 Symptoms of Hearing Loss (Can Be Isolated or in Combination With the Other Symptoms)

Tinnitus
Difficulty understanding speech, especially in noisy environments
Difficulty hearing or understanding children's or female voices
Always asking others to repeat what they said
Complaining that people mumble when they speak
Television or radio volume louder than normal
Difficulty hearing or understanding on the phone
Loss of awareness of environmental sounds
Withdrawal from social situations or not participating in conversations
Balance issues

For patients over the age of 60, it is more challenging because this age group almost assures us that there will be some age-related HF SNHL. Again, an unremarkable case history is an indicator that microangiopathy might have begun. Prediabetes needs to be ruled out.

Prescription and Over-the-Counter Medication Side Effects for Diabetes Management

There are over 80 prescription medications approved by the Food and Drug Administration (FDA) for type 1 and type 2 diabetes management.

Standards for pharmaceuticals are different from those of dietary supplements. FDA requirements for showing evidence of safety and efficacy is not required for vitamins, minerals, and other dietary supplements prior to appearance on the market. By law, dietary supplement packaging and advertising must state that the product is not intended to diagnose, treat, prevent, or cure any disease.

Dietary supplements are classified by the FDA as food, not as drugs. However, many dietary supplements contain ingredients that may conflict with a prescription medicine or other medical condition. Products containing hidden drugs are also sometimes falsely marketed as dietary supplements, putting consumers at even greater risk. For these reasons, it is important for patients to consult with a health care professional before using any dietary supplement.

The American Diabetes Association does not recommend the routine use of herbal supplements or micronutrients, only recommending supplements in the case of vitamin B_{12} deficiency or multivitamin use in special populations, including pregnancy, older adults, vegetarians, and people following very low calorie or low carbohydrate diet.

For a comprehensive list of side effects of pharmaceuticals and dietary supplements used in diabetes management see DiSogra and Mcelhannon in the For Further Reading section.

Communication Strategies

Until a PWD with communication issues is evaluated by an audiologist, there are many communications strategies that can be used by a PWD and their family and friends. The reader can access these strategies on The Audiology Project website at www.theaudiologyproject.com (click on "Educational Materials," then click on "For Patients," and then click on "Communication Strategies").

Find an Audiologist Near You

Doctors of audiology (AuD) work in hospitals, medical centers, university speech and hearing centers, the Veterans Administration, or private practice. A simple Google search using "Find an audiologist near me" is all that has to be done.

To learn more about audiologists, visit www.audiology.org/consumers-and-patients/what-is-an-audiologist/.

Summary

Diabetes care and education specialists (DCESs) must be aware that a PWD experiencing diabetes-related retinopathy could also be experiencing DSNHL. Because diabetes-related retinopathy directly affects mobility (thus increasing the risk of a fall), a PWD will seek help for their vision loss sooner than help for a hearing loss from the same cause.

Hearing loss does not affect mobility. This is the reason DSNHL is the "silent" side effect" of diabetes.

Therefore, a DCES should include a referral for a comprehensive hearing examination by an audiologist with the same priority as a referral for a comprehensive eye examination to establish a baseline to monitor any reported changes in vision and/or hearing.

Audiologists are trained to evaluate, diagnose, and manage hearing loss in all age groups in addition to establishing a close working relationship with DCESs. ■

About the Author

Robert M. DiSogra, AuD, is a consulting audiologist in Millstone, NJ. He is a founding member currently serving on the Board of Directors of The Audiology Project (www.theaudiologyproject.com), an international nonprofit organization

that promotes hearing loss awareness and management from diabetes and other chronic illnesses. Dr DiSogra has contributed 2 articles to *ADCES in Practice* (see References) and continues to lecture on the impact of hearing loss from diabetes and other chronic illnesses. Correspondence: bobdisogra@gmail.com.

Acknowledgments

Joanne Rinker, CDCES, former director of practice and content development for *ADCES*; Kathy Dowd, AuD, executive director of The Audiology Project.

Author Contributions

Robert M. DiSogra authored this manuscript.

Declaration of Conflicting Interests

No conflicts of interest (financial and nonfinancial).

Funding

No funding was needed for this article.

Guarantor Statement

Dr DiSogra takes full responsibility for the content of this article.

Robert M. DiSogra
https://orcid.org/0000-0002-0055-7947

FOR FURTHER READING

American Diabetes Association. Facilitating behavior change and well-being to improve health outcomes: standards of medical care in diabetes. *Diabetes Care.* 2021;44(suppl 1):S53-S72.

American Speech, Language, Hearing Association. Causes of hearing loss in adults. 2025. Accessed June 26, 2025. https://www.asha.org/public/hearing/causes-of-hearing-loss-in-adults/?srsltid=AfmBOorv0_lCQwD3mixpYpiCWSp8QP3Ah-HKJ5Hf77eStFA2k8KjLmUGf

Centers for Disease Control and Prevention. Diabetes and hearing loss. 2021. Accessed June 26, 2025. https://www.cdc.gov/diabetes/managing/diabetes-hearing-loss.html

Dalton DS, Klein R, Klein BEK, Moss SE, Cruickshanks KJ. Association of NIDDM and hearing loss. *Diabetes Care.* 1998;21(9):1540-1544.

DiSogra RM. Hearing loss in diabetes: communication strategies. *ADCES in Practice.* 2017;5(2):32-37.

DiSogra RM, Beck DL. How chronic illnesses impact hearing, balance, and cognition: a guide for hearing care professionals. *Hear Rev.* 2025;32(2):8-12.

DiSogra RM, Mcelhannon M. Auditory and vestibular side effects of pharmaceuticals and nutraceuticals used for diabetes management: an overview and guide for audiologists and diabetes educators. *ADCES in Practice.* 2022;10(6):16-26.

Food and Drug Administration. Dietary supplements. 2021. Accessed June 26, 2025. https://www.fda.gov/consumers/consumer-updates/dietary-supplements

Hannon BA, Fairfield WD, Adams B, Kyle T, Crow M, Thomas DM. Use and abuse of dietary supplements in persons with diabetes. *Nutr Diabetes.* 2020;10:14. doi:10.1038/s41387-020-0117-6

Jorgensen MB, Buch NH. Studies on inner-ear and cranial nerves in diabetes. *Acta Otolaryngol.* 1961;107:179-182.

Kirthi V, Nderitu P, Alam U, et al. The prevalence of retinopathy in prediabetes: a systematic review. *Surv Ophthalmol.* 2022;67(5):1332-1345.

Makihima K, Tanaka P. Pathological changes of the inner ear central auditory pathway in diabetic patients. *Ann Otol Rhinol Laryngol.* 1971;80(2);218-228.

National Institute on Aging. Hearing loss: a common problem for older adults. 2025. Accessed June 26, 2025. https://www.nia.nih.gov/health/hearing-and-hearing-loss/hearing-loss-common-problem-older-adults

Shortsleeve C. Early eye exams are essential for new patients with diabetes. MedScape. June 16, 2025. Accessed June 26, 2025. https://www.medscape.com/viewarticle/early-eye-exams-are-essential-new-patients-diabetes-2025a1000fzw

Taylor IG, Irwin J. Some audiological aspects of diabetes mellitus. *J Laringol Otol.* 1978;92(2):99-113.

Building the Bridge to Optimal Diabetes-Cardiometabolic Care Leveraging **Artificial Intelligence**

JANICE MACLEOD, MA, RD, CDCES, FADCES

We have an unprecedented opportunity right now to transform health care. In fact, artificial intelligence (AI) experts predict that there will be more change in health care in the next decade than in the previous century.[1] Why does health care need to change? Health care needs to change because health care isn't healthy. In fact, health care is in a serious unsustainable crisis.[2] We urgently need to think about and deliver care completely differently. As members of the health care team, we each have a role and responsibility to leverage AI responsibly in a way that can transform health care and make it healthy. Ready or not, AI and what is being called the "intelligent health revolution" is here.[1] Because it is a revolution, it brings major opportunities and major challenges. Being paralyzed with fear or blindly believing in miracles will not help us make the most of it. It is up to each one of us to harness AI for the good it can do for health care. In this article, I discuss action steps to take to build your AI acumen and to lead in building the bridge to optimal chronic care as presented at the ADCES24 panel discussion, "Employ Artificial Intelligence to Advance Diabetes-Cardiometabolic Care." See the side bar for action steps to take to build your AI acumen and for definitions on the various types of AI.

It is estimated that 90% of the $4.3 trillion annual cost of health care in the United States is spent on medical care for chronic diseases.[3] The increasing prevalence of complex cardiometabolic conditions combined with a waning number of skilled care providers[4] underscore the need for new approaches to chronic care management to expand access to care, lessen the burden of care, improve efficiencies, and reduce unsustainable medical costs. It is reported that primary care providers with a typical panel of 2500 adult patients would need to work 26.7 hours per day to provide all the recommended preventive chronic care. Although the time demands are still excessive, if a team-based care model (including RDNs) is implemented, the hours needed to provide recommended care decrease by over half.[5] It is predicted that generative AI

technologies, such as ChatGPT, will be able to help lessen the workload considerably as AI reliability and capability continue to improve.[6] This is an opportunity for diabetes care and education specialists (DCESs), well-versed in AI technologies, to provide their expertise to boost the value and reach of their services in the primary care setting and beyond.

With health inequities estimated to cost the US health care system approximately $93 billion annually, addressing disparities is critical for value and sustainability.[7] Finding efficient ways to assess and address social determinants of health (SDOH) through linking to local community resources is essential.[8] AI-enabled geo-location capabilities could identify local food banks for those with food insecurity. AI capabilities can be used to efficiently scan free text in medical records, where many risk factors for disease severity and progression and SDOH, are captured and thus help clinicians and health care systems identify at-risk patients. In response to the challenges health care is facing, the Institute for Healthcare Improvement has set forth the quintuple aim (Figure 1): improving the health of the population (Aim 1) at lower cost (Aim 2) while improving both the patient and health care team care experience (Aims 3 and 4) and addressing disparities in care (Aim 5).[9] The fifth aim requires a shift from a downstream, reactive health care approach to an upstream, proactive, preventive approach. The quintuple aim provides a useful framework for the DCES to consistently communicate the value of their services:

- How are the services you provide cost-effectively improving the health of the populations you serve?
- What are you doing to improve the experience of health care for patients and the clinical team?
- How are you expanding access to your services?

We can think of this as building a bridge to optimal chronic care. We are on one side of the bridge, and we want to get to the other side to optimal chronic care, as illustrated in Figure 2.

We need to consider what our role is and how AI could help.

Our current approach to health care provides generalized, one-size-fits-all care (mass generalization). We need to be able to provide personalized care for entire populations at scale (mass customization).[10] We need to pivot from an episodic model of care to a continuous, on-demand approach to care and education that better matches the relentless 24/7 demands of living with a complex, self-managed condition such as diabetes. Today, we often lack the data needed for clinical decision-making. We need to consistently have data to inform timely care for our entire population. Today, our approach to care is siloed and problem oriented. In diabetes, for example, we tend to be glycemic (or even A1C) centric. We need to see and treat the whole person in their life context. Our current care model is fragmented. We need to move to true team-based care (even if not in the same location) through communication and collaboration so the care plan is integrated and works seamlessly across multiple chronic conditions. Finally, we need to move from transactional reimbursement for doing things (fee-for-service) to a focus on value not just in how we get paid but also in how we think about and deliver care.

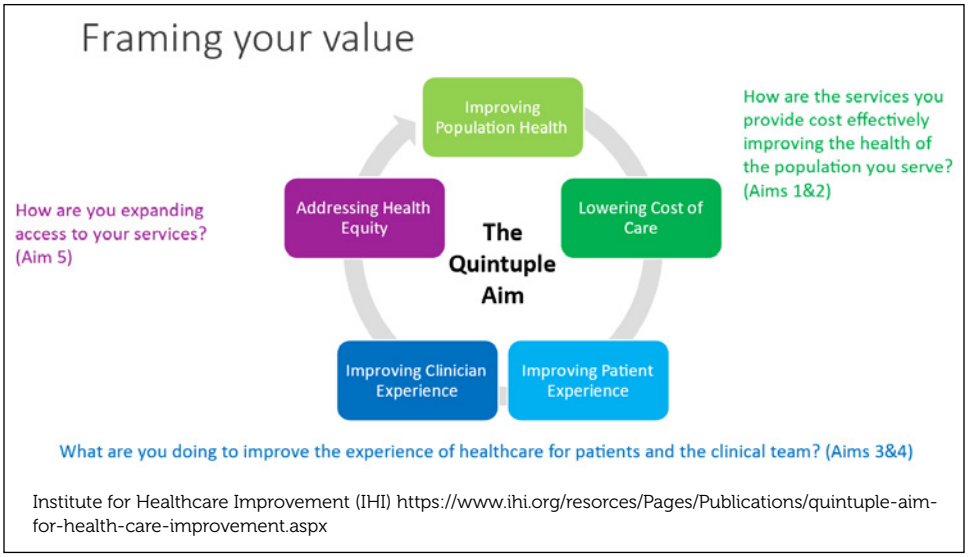


Figure 1. Institute for Healthcare Improvement quintuple aim: framing your value.

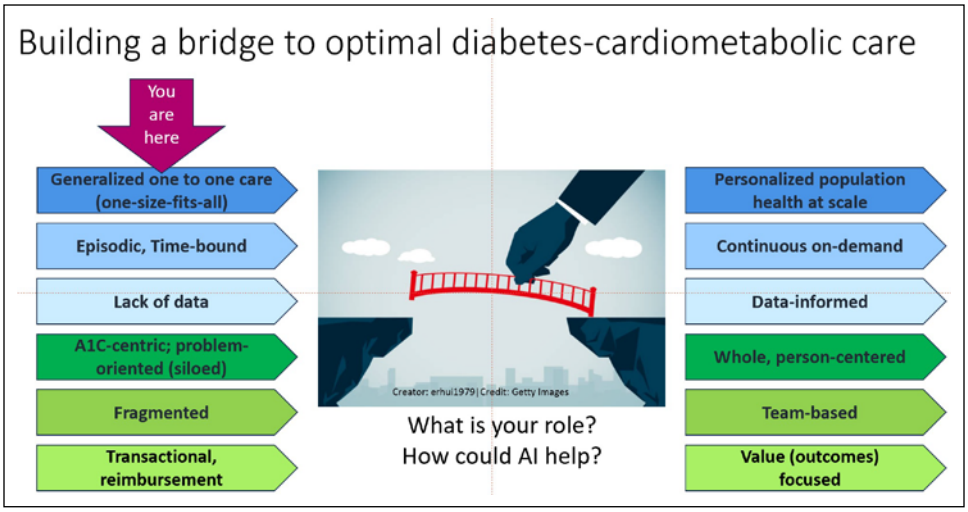


Figure 2. Building the bridge to optimal diabetes-cardiometabolic care.

Let's layer in the building blocks to build our bridge to the other side (Figure 3).

- **Building Block 1:** A growing suite of connected technologies enables people to gather data as they live their lives; AI analyzes the data and provides personalized 24/7 coaching, supporting people as they self-manage their chronic conditions while away from the care team.
- **Building Block 2:** Clinicians can remotely monitor population-level data to assess the health of their populations, efficiently identifying who needs human intervention from the clinical care team and when, whether a brief coaching nudge or reminder, an adjustment in therapy, or behavioral or social support. The clinical team interacts with individuals in a continuous feedback loop.
- **Building Block 3:** Protocol-guided, data-informed care and education enable the shift to an on-demand, continuous care approach that allows clinicians to operate at the top of their scope of practice, making the most of valuable clinician time.
- **Foundation:** At the foundation, ongoing assessment of SDOH is automated linking at-risk individuals with local resources and

social and behavioral support as needed. This enables a shift from a reactive to a proactive approach to care.

Table 1 provides short-term action steps and longer-term plans for helping the DCES lead in building the bridge to optimal chronic care in their place of practice.

Conclusion/Call to Action

Review the action steps in the sidebar to begin to build or enhance your AI acumen. Then get ready to step up and lead your team in building the bridge to optimal chronic care. Get started right away with the short-term action steps in Table 1. Begin longer-term planning as you complete the short-term actions. The bottom line is don't wait for someone else to build the bridge or to be invited to build the bridge. You are the one with the skills and expertise to build the bridge. The time is now. ■

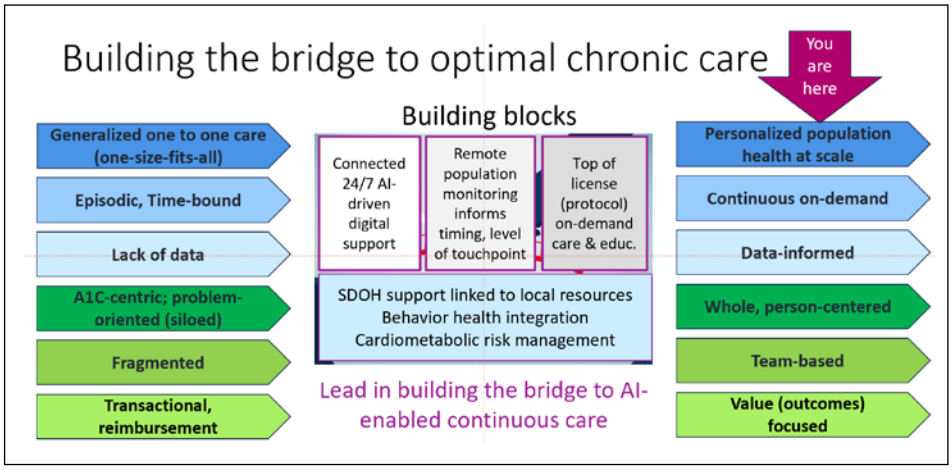


Figure 3. The building blocks for the bridge to optimal diabetes-cardiometabolic (chronic) care.

Declaration of Conflicting Interests

Janice MacLeod MA, RD, CDCES, FADCES is serving as a consultant to Welldoc and Beta Bionics, doing medical writing, evidence strategy, and science calendar management.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Janice MacLeod https://orcid.org/0000-0001-8689-4938

Table 1 Short-Term Action Steps and Long-Term Plans for Building the Bridge to Optimal Chronic Care

Building block	Building Block 1: A growing suite of connected technologies enables people to gather data as they live their lives; AI analyzes the data and provides personalized 24/7 coaching, supporting people as they self-manage their chronic conditions while away from the care team. AI-driven digital self-management support	Building Block 2: Clinicians can remotely monitor the population-level data to assess the health of their populations, efficiently identifying who needs human intervention and when, whether a brief coaching nudge or reminder, an adjustment in therapy, or behavioral or social support, interacting with clients in a continuous feedback loop. Informs timing, level of clinical intervention	Building Block 3: Protocol-guided data-informed care and education enable the shift to an on-demand, continuous care approach, allowing the DCES to operate at the top of their scope of practice, making the most of valuable clinician time. Automate ongoing assessment of SDOH, linking at-risk individuals with local resources and social and behavioral support as needed. This enables a shift from a reactive to a proactive approach to care. Pe protocol data-informed, on-demand care and education
Short-term actions	Help individuals identify and get started on connected technologies	Determine workflow, roles, and responsibilities for collaborative use of person-level data	Develop organization-approved practice protocols that enable the DCES to practice of scope of practice to adjust and recommend therapies
Longer-term plans	Automate technology decision aids to keep the technology conversation happening on a timely basis.	Evaluate potential platforms for population-level data remote monitoring with auto triggers for referrals to DCES services.	Automate clinical decision support and SDOH assessments and AI-enabled linkages to local resources for at risk individuals.

Abbreviations: AI, artificial intelligence; DCES, diabetes care and education specialist; SDOH, social determinants of health.

SIDEBAR: ACTION STEPS TO TAKE TO BUILD AI ACUMEN

- Consider following these experts in the application of AI to health care.
  - Dr Bertlan Mesko, MedicalFuturist.com; https://www.linkedin.com/in/bertalanmesko/
  - Dr Eric Topol, https://www.linkedin.com/in/eric-topol-md-b83a7317/
  - Dr Harvey Castro, harveycastromd.info linkedin.com/in/harveycastromd
  - Tom Lawry, https://www.tomlawry.com/; https://www.linkedin.com/in/tomlawry/
  - Jan Beger, https://lnkd.in/eR7qichj; keep up with publications on AI in health care by following Jan Beger from GE Health on LinkedIn, who summarizes and provides link to relevant articles.
- Review the Coalition for Health AI Blueprint for Trustworthy AI, https://www.chai.org/workgroup/responsible-ai/blueprint-for-trustworthy-ai
- Add to your reading list: Lawry T. Hacking Health Care How AI and the Intelligence Revolution Will Reboot an Ailing System. Routledge; 2023.
- Review "Augmented Intelligence in Medicine" by the American Medical Association. Available at https://www.ama-assn.org/practice-management/digital/augmented-intelligence-medicine.
- Consider enrolling in AI training and certification offerings at the American Board of Artificial Intelligence in Medicine, https://abaim.org/
- Review National Academy of Medicine's "Code of Conduct for AI in Health, Healthcare and Biomedical Science," https://nam.edu/programs/value-science-driven-health-care/health-care-artificial-intelligence-code-of-conduct/
- Consider every repetitive task you do over and over each day as you provide consultations, teach classes, and document your visits. How could AI help?
- Use the Chat GPT Prompt guide to learn how to refine your prompts to optimize output: "CHAT GPT Cheat Sheet," by Dr Harvey Castro (AI expert and medical doctor), https://www.linkedin.com/posts/harveycastromd_chatgpthealthcare-thegptpodcast-harveycastromd-activity-7090635508002811904-3hxw/
- Make a list of what you could do to bring value to clients if freed from the rote, repetitive tasks.
- Lean in. Embrace the change. Be part of the solution.

WHAT IS ARTIFICIAL INTELLIGENCE?

Artificial intelligence (AI): Software that learns, simulating intelligent behavior in computers.

Rule-based AI: Predefined rules are used to process data and make decisions. This is suited for environments where rules and outcomes are constant and clear, for example, an automated insulin calculator that used an insulin-to-carbohydrate ratio and correction factor to recommend an insulin bolus dose.

Machine learning (ML): A subset of AI that enables systems to learn from data, identify patterns, and make decisions with minimal human intervention. Types of ML include:

- Supervised learning: Algorithms are trained on labeled data.
- Unsupervised learning: Algorithms identify patterns in unlabeled data.
- Reinforcement learning: Systems learn through trial/error, receiving rewards for correct actions.

Deep learning (DL): A subset of ML involving neural networks with multiple layers, enabling high-level data abstraction and pattern recognition. DL could be used for pathology and radiology advanced image analysis, speech recognition and natural language processing applications, and analysis of genomic data for personalized medicine. Concerns include the lack of transparency of DL models and potential biases and ethical considerations in the decision-making processes.

Natural language processing (NLP): A field of AI that focuses on the interactions between computers and humans through natural language. NLP could be used to extract relevant information from unstructured data, such as clinical notes. Virtual health assistants and chatbots can be used to answer colleague or patient questions. NLP could provide automated transcription, summarization.

Generative AI: A broad category of AI that can create original content. Generative AI tools are built on underlying AI models, such as a large language model (LLM; the text-generating part of generative AI).

REFERENCES

1. Lawry T. *Hacking Healthcare How AI and the Intelligence Revolution Will Reboot an Ailing System*. Routledge Taylor & Francis Group; 2023.

2. Biel M, Grondys K, Androniceanu AM. A crisis in the health system and quality of healthcare in economically developed countries. *Int J Environ Res Public Health*. 2022;20(1):469. doi:10.3390/ijerph20010469

3. Volpp KG. Food is medicine: a presidential advisory from the American Heart Association. *Circulation*. 2023;148(18):1417-1439. doi:10.1161/CIR.0000000000001182

4. Dall T, West T, Chakrabarti R, et al. *The Complexities of Physician Supply and Demand: Projections From 2016 to 2030*. American Association of Medical Colleges; 2018.

5. Porter J, Boyd C, Skandari MR, et al. Revisiting the time needed to provide adult primary care. *J Gen Intern Med*. 2023;38:147-155. doi:10.1007/s11606-022-07707-x

6. Pearl R. ChatGPT will reduce clinician burnout, if doctors embrace it. Published December 11, 2023. Accessed October 1, 2024. https://www.linkedin.com/pulse/chatgpt-reduce-clinician-burnout-doctors-embrace-robert-pearl-m-d--itqqc/

7. Deloitte Insights. Inequities in the US health system cost approximately $320 billion today and could eclipse $1 trillion in annual spending by 2040 if left unaddressed. Published 2022. Accessed March 25, 2025. https://www2.deloitte.com/us/en/insights/industry/health-care/economic-cost-of-health-disparities.html

8. Solomon LS, Kanter MH, Health care steps up to social determinants of health: current context. *Perm J*. 2018;22:18-139.

9. Nundy S, Cooper LA, Mate KS. The quintuple aim for health care improvement: a new imperative to advance health equity. *JAMA*. 2022;327(6):521-522. doi:10.1001/jama.2021.25181

10. Chaudhri A, Lillrank P. Mass personalization in healthcare: insights and future research directions. *J Adv Manag Res*. 2013;10(2):176-191. doi:10.1108/JAMR-05-2013-0033

Embracing Risk Assessment

Using the Failure Mode and Effect Analysis (FMEA) Process in CQI

TAMARA SWIGERT, MSN, RN, CDCES

Certified diabetes care and education specialists (CDCESs) are always looking for ways to better serve clients with diabetes or prediabetes. In fact, continuous quality improvement (CQI) is written right into the National Standard of Diabetes Self-Management Education & Support (DSMES).[1] Quality improvement initiatives come in many forms. A list of examples might include a project to more effectively deliver education, a new process to make answering questions or ordering refills more efficient, or a protocol to titrate medications and, in turn, address clinical inertia.

To the developer of such initiatives, the benefits may seem obvious; but it is important to acknowledge that even the best ideas likely come with risks—risks to patients, to the licensed professional, and to the organization. Many organizations have risk management (or similar) committees that review and approve new initiatives to address this concern. If your project

is one that has the potential to cause any harm or increase liability, chances are you'll be asked to complete a risk assessment.

Do you cringe when you hear the term "risk assessment" (or do you wonder what the term even means)? If so, you are not alone! But the truth is, risk assessment is a cornerstone of safe, high-quality health care. Although it can be perceived as a time-consuming institutional requirement (and let's face it, a burden to a busy CDCES), structured risk assessment tools/methods like *failure mode and effects analysis* (FMEA) offer a practical way to anticipate problems before they occur rather than reacting to them after an event has occurred. In diabetes care, where small errors—especially with medication—can have life-threatening consequences, proactive risk assessment and mitigation are essential.[2,3]

So, what is FMEA? FMEA is basically a formalized way of asking: "What could go wrong here, and how bad would it be if it did?" Once you have answered some key questions, you have a strategy to reduce those risks. That's it in a nutshell. It's not rocket science (even though it was technically developed by aerospace engineers). In health care specifically, it provides a systematic approach to evaluating a clinical process for potential points of failure. It encourages interdisciplinary collaboration, enhances patient safety, and supports a culture of continuous improvement.[4]

Let's break it down.

Understanding FMEA

FMEA involves identifying steps in a clinical process, recognizing potential failure modes at each step, assigning numerical scores to evaluate their impact, and prioritizing the highest risks for mitigation.[5] The risk assessment scores are based on 3 criteria:

1. Severity (S): how harmful the error could be (1 might be inconvenience, and 10 would be catastrophic, eg, death or permanent disability);
2. Occurrence (O): how likely it is to happen (1 is extremely unlikely, and 10 is extremely likely, an almost certain occurrence);
3. Detectability (D): how likely it is the error will be caught before it causes harm (1 is almost guaranteed to be detected, and 10 is very unlikely it will be detected).

From these criteria scores, the risk priority number (RPN) is calculated.

The formula is: **S × O × D = RPN**.

High RPNs indicate issues that need immediate attention.[6] Keep in mind that high scores do not mean the initiative is doomed to fail; rather, it tells the project team where to focus efforts to mitigate those risks.

Consider how the FMEA was used in the following case.

Case Study: Developing an Insulin Titration Protocol

Setting.
The setting is a rural primary care clinic with several providers and a large cohort of patients with type 2 diabetes. The clinic employs a CDCES and offers DSMES services.

Project team.
The project team includes a diabetes specialist team lead (RN/CDCES), primary care provider champion (MD), and patient safety and quality lead (PharmD).

Background.
Maria, the clinic RN/CDCES, observed that patients on basal insulin were experiencing delayed dose adjustments due to scheduling bottlenecks. She recognized that delayed dose adjustment is a significant contributing factor to clinical inertia.[7] To address this, she proposed a standing order protocol enabling her and the 4 clinic RNs to titrate insulin based on structured guidelines and provider approval. As part of the initiative, she proposed that she as the CDCES provide ongoing education and support to her fellow RNs.

Process.
Maria worked closely with the physician champion on the protocol specifics, ensuring that only appropriate patients would be included and that all dose adjustments are reflective of current

evidence-based clinical practice guidelines. She met with the nurses to gauge their interest, willingness, and availability; RN support was unanimous.

The patient safety and quality lead, a pharmacist, advised Maria on the organization's project approval process. This included conducting a risk assessment to identify and mitigate potential issues, which would then be reviewed and discussed at the monthly risk management committee meeting. As a start, Maria and her team thought through steps in the protocol: identifying eligible patients, reviewing glucose data, calculating dose adjustments, communicating with patients, and documenting insulin changes. Using FMEA, they generated a list of potential failure modes associated with each protocol step.

Risk analysis with FMEA.

Table 1 Potential Failure Modes and Proposed Mitigation

Failure Mode	Severity	Occurrence	Detectability	Risk Priority Number	Proposed Mitigation Actions
Incorrect insulin dose calculation	8	4	6	192	Implement an EHR-based dose calculator Require dual RN verification[6,8]
Patient misunderstanding insulin instructions	5	6	4	120	Verify/document patient has completed diabetes education Provide written instructions Schedule follow-up calls/portal message within 24 h[4,8]
Including an ineligible patient (eg, on steroids)	7	3	7	147	Add a "hard-stop" checklist in the EHR to confirm diagnosis and exclude inappropriate candidates[3,9]
New dose exceeds patient's supply (Rx insufficient)	4	4	3	48	Add EHR prompt to compare to current insulin prescription once new dose entered
Delay in documentation of dose change	4	3	3	36	Default to organization's policy that RN notes must be signed within 24 hours or prompt is received (no additional actions)

Abbreviation: EHR, electronic health record.

Once the team identified failure modes, they scored them accordingly. Table 1 lists examples (note that the actual list would likely include more failure modes than what appears in Table 1).

Implementing mitigation strategies.

The team addressed the top risks first by incorporating safeguards into workflow, such as automation for dose calculation, structured patient education, and better data verification procedures. These changes allowed for safer titration without overburdening the staff. Failure modes with lower RPNs were not ignored but were addressed with either limited proposed actions or via existing policies/tools.

Pilot and monitoring.

A 30-day pilot with 10 patients demonstrated improved glucose management in 80% of participants and no adverse outcomes. The clinic scheduled quarterly protocol reviews using the same FMEA framework to assess ongoing risks and make adjustments.[2,6]

Why Risk Assessment Matters

Risk assessment is not just a regulatory checkbox—it is a patient safety imperative. According to the American Diabetes Association, insulin is one of the top medications associated with adverse drug events in outpatient care.[3] FMEA provides a structured method to catch errors before they reach the patient.

Health care professionals, especially CDCESs, are well positioned to lead these assessments. Their expertise in chronic disease management and their close patient relationships give them unique insights into where gaps exist. FMEA provides the tools to turn that insight into action.

In practical terms, investing time in identifying and mitigating risk from the beginning increases the chances of organizational approval. Why? Because the diabetes specialist has already thought through issues with which the organization is likely to have concerns and likely has a response to address those concerns. Furthermore, embracing the process has the potential to increase the organization's confidence

and trust in the CDCES and increasingly recognize that person as a true subject matter expert.

Risk assessment does not need to be intimidating, aggravating, or overly time-consuming. With a focused approach, such as the FMEA method, risk assessment can enhance patient outcomes, empower care teams, and help structure initiatives that are safer and more sustainable. By comparing risks of varying severity, as in the case study presented here, teams can focus resources where they matter most—supporting patients and improving care delivery. ■

Declaration of Conflicting Interests

None.

Funding

None.

REFERENCES

1. Davis J, Hess Fischl A, Beck J, et al. 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care*. 2022;45(2):484-494. doi:10.2337/dc21-2396

2. Institute for Healthcare Improvement. Failure modes and effects analysis (FMEA) tool. Accessed May 25, 2025. https://www.ihi.org/resources/Pages/Tools/FailureModesandEffectsAnalysisTool.aspx

3. American Diabetes Association Professional Practice Committee. Standards of Care in Diabetes—2025. *Diabetes Care*. 2025;48(suppl 1):S1-S352.

4. Aboumatar H, Kinyua E, Saliba R, et al. Using FMEA to enhance safety in clinical practice: a tool for proactive assessment. *BMJ Open Qual*. 2021;10(2):e001209.

5. Centers for Medicare & Medicaid Services. Guidance for failure mode and effects analysis (FMEA). 2020. Accessed July 21, 2025. https://www.cms.gov/medicare/provider-enrollment-and-certification/qapi/downloads/guidanceforfmea.pdf

6. Shepherd E, Wiles K, Brook J. Using FMEA in nursing to reduce risks in medication titration. *J Nurs Manag*. 2023;31(1):12-18.

7. Gavin JR, Abaniel RM, Virdi NS. Therapeutic inertia and delays in insulin intensification in type 2 diabetes: a literature review. *Diabetes Spectr*. 2023;36(4):379-384. doi:10.2337/ds22-0084

8. Institute for Safe Medication Practices. *Guidelines for Standard Order Sets*. 2020.

9. Snyder AM, Mitchell JM, Chewning B. Enhancing insulin safety: team-based insulin titration protocols. *J Am Pharm Assoc*. 2022;62(4):1192-1197.

MATCH

Training Programmatic Staff in Health Equity Strategies to Build Confidence in Advancing Equity

ALICIA JACKSON, MED, CHES, REYNA SILVA, MPH, CHES, NEENA SMITH-BANKHEAD, MS, D'JATA BARRET, MPH, NATELEGE SWAINSON, MPH, PMP, AND KYANDRA FOX, MHA

Health equity remains a foundational element of effective public health practice. This is particularly true in diabetes prevention and management, where inequities disproportionately affect racially and ethnically minoritized communities, individuals living in underresourced areas, and populations facing systemic barriers to care. Type 2 diabetes continues to be overrepresented in communities with fewer economic opportunities, limited access to preventive services, and increased exposure to the conditions that drive chronic disease risk. As national funding agencies increasingly emphasize health equity as a core priority, the capacity of programmatic and technical assistance (TA) staff to engage confidently in equity-centered work has become essential.

The Diabetes MATCH (Mobilizing Access Through Capacity Building and Health) Initiative—jointly led by the Emory Centers for Public Health Training and Technical Assistance and the Association of Diabetes Care & Education Specialists (ADCES)—is funded through a cooperative agreement with the Centers for Disease Control and Prevention (CDC-RFA-DP-23-0021). MATCH supports recipients of the companion funding opportunity, A Strategic Approach to Advancing Health Equity for Priority Populations With or at Risk for Diabetes (CDC-RFA-DP-23-0020), by helping state health departments, community-based organizations, and partners strengthen their capacity to deliver diabetes-related interventions. As MATCH staff serve as trainers, TA providers, and capacity-building agents for recipients nationwide, the initiative recognized the need to ensure that its own team members possessed the skills, knowledge, and confidence necessary to model and support equity-informed practice.

In response, the Health Equity Team designed and implemented a comprehensive, multipronged internal training program to strengthen staff capability to operationalize health equity principles in their work. The training program was created against the backdrop of an increasingly polarized political landscape, where equity terminology and related initiatives may elicit resistance or discomfort among stakeholders. This context underscored the importance of preparing staff not only to apply equity concepts but also to navigate challenging conversations, recognize their own biases, and maintain clarity and compassion in their approach.

This article describes the development, implementation, and early outcomes of this health equity training initiative, developed to build the confidence, competence, and commitment of programmatic staff working to advance equity in diabetes prevention and management.

Methods

The training model was developed using a data-informed, iterative design process. Work began with an internal focus group involving programmatic staff representing a range of professional backgrounds, experience levels, and roles in the MATCH Initiative. The purpose of this focus group was to:

- assess staff's health equity competencies
- understand their comfort level with equity-related concepts
- identify common challenges encountered in their work
- explore their expectations for professional development.

During the focus groups, staff were presented with the Office of Health Equity's (OHE) Health Equity Domains, shown in Figure 1, and engaged in guided discussions about their knowledge of the domains and how they apply them in their day-to-day work. Findings revealed variation in staff's familiarity with equity topics. Some individuals were highly experienced in facilitating equity discussions and applying equity frameworks to public health practice. Others expressed discomfort or hesitancy, often related to fears of causing harm, low confidence in their knowledge or skills, and concerns about navigating politically sensitive environments. These insights served as the foundation for designing a differentiated learning plan that acknowledged the staff's diverse starting points.

The training program was built around 3 core principles:

1. Meet staff where they are by offering developmentally appropriate content that does not assume prior expertise.
2. Integrate structured and unstructured learning to address both technical knowledge (eg, health equity frameworks) and interpersonal skills (eg, confidence in facilitating sensitive conversations).
3. Promote continuous reflection and application, ensuring that staff connect learning to their daily responsibilities.

Domain One	Organizational and Program Policy: Embrace equity as the foundation of organizational commitments, policies, and practices
Domain Two	Infrastructure: Establish and maintain infrastructure to advance equity.
Domain Three	Communication: Communicate effectively to advance equity.
Domain Four	Community Engagement and Partnership: Engage communities and mobilize partners to enable effective and sustainable organizational efforts.
Domain Five	Structural and Social Determinants of Health: Advance health equity in the context of structural and social determinants of health.
Domain Six	Anti-racism and Anti-oppression: Embody anti-racism and anti-oppression in all aspects of the organization and its interventions
Domain Seven	Evaluation: Apply equity-oriented and equitable evaluation approaches to monitor and evaluate progress towards health equity

Figure 1. Office of Health Equity's Health Equity Domains

Training sessions are held monthly and facilitated by the internal Health Equity Team with contributions from external experts specializing in messaging, bias, structural determinants of health, human behavior, and reflective practice. Each session followed a consistent structure:

- Foundational content: definitions, frameworks, and practical tools.
- Facilitated breakout discussions: small-group dialogue designed to allow staff to process material in a supportive environment.
- Application scenarios: realistic TA challenges requiring staff to apply health equity principles.
- Reflective assignments: short, structured prompts encouraging ongoing self-assessment and integration into daily work.

Session topics included health equity messaging, unconscious and implicit bias, culturally responsive engagement, navigating politicized environments, trauma-informed communication, and strategies for identifying opportunities to embed equity into program planning, development, and implementation.

Figure 1. Health equity core imperatives.

The initial sessions were grounded in a set of core health equity imperatives, shown in Figure 2, which served as a foundational framework for the training series. During these sessions, the imperatives were first introduced and situated within relevant organizational and programmatic contexts. Staff then engaged in facilitated breakout discussions using role-specific scenarios that reflected real-world challenges. These discussions provided participants with structured opportunities to practice applying the imperatives to their daily work, including program planning, implementation, and decision-making.

Progress was monitored through postsession surveys and informal feedback. The Health Equity Team used this data to continuously refine the curriculum, adjust facilitation approaches, and add targeted content where additional support was needed.

Results

Evaluation findings indicate that the internal health equity training initiative has improved staff confidence, awareness, and readiness to embed equity principles into their TA delivery and other projects. Early sessions revealed initial hesitation driven by both personal discomfort with sensitive topics and uncertainty about how equity fits into varying programmatic roles. However, comfort levels have increased over time as staff built shared language, trust, and familiarity.

More than 90% of evaluation respondents reported that the trainings helped them better integrate health equity into their work or increased their ability to recognize patterns, behaviors, or biases within themselves. Participants also described feeling more equipped to identify entry points for advancing health equity in conversations with recipients, even when equity was not explicitly requested or when partners expressed reluctance to engage in equity discourse.

Qualitative feedback illuminated several key themes:

- Increased confidence: Staff reported feeling more secure in their ability to explain health

equity, address misconceptions, and engage in conversations previously perceived as challenging or risky.

- Greater self-awareness: Reflective exercises prompted participants to identify personal biases, communication habits, and assumptions that influence their approach to TA.
- Enhanced practical skills: Staff gained concrete tools, such as messaging frameworks and question prompts.
- Stronger team cohesion: The shared learning environment fostered a collective sense of purpose and mutual support, making equity-related conversations feel safer and more productive.

Additionally, staff reported that the training program helped bridge the gap between theoretical understanding and real-world application. This was particularly important given the broad portfolio of MATCH recipients, whose geographic, political, cultural, and organizational contexts vary widely.

Table 1 Multipronged Health Equity Training Approach

Training element	Description	Intended outcome
Foundational knowledge	Health Equity core imperatives, key messages, and shared language	Conceptual clarity
Health equity assessments	Reflective self-assessments, such as the Harvard Implicit Association Test, or Preventive Cardiovascular Nurses Association Health Equity Assessment Tool	Increase self-awareness
Experiential learning	Role-specific, scenario-based breakout discussions	Skill application
Reflective space	Guided reflection and dialogue following assessments and activities	Critical self-awareness
Practical tools	Action-oriented resource guides to support equity integration into daily work	Real-world application
Psychological safety	Level-setting each training with "community agreements" to emphasize trust, curiosity, and confidence in sharing	Sustained engagement and trust
Ongoing reinforcement	Multiple sessions over time	Skill development and retention

Conclusion

Health equity is not a checklist item but an ongoing practice rooted in continuous learning, reflection, and skill-building. For programmatic and TA staff who play a critical role in shaping how funded entities and community partners interpret and apply equity principles, ongoing professional development is essential. The training initiative described in this article demonstrates that a thoughtfully designed, multipronged approach (detailed in Table 1) can effectively strengthen staff capacity to advance equity in diabetes prevention and management settings.

Early results demonstrate that staff benefit from a training structure that balances foundational knowledge with experiential learning, provides dedicated space for reflection and practicing how to incorporates practical tools for real-world application. The model also underscores the value of creating psychologically safe learning environments where questions, uncertainty, and vulnerability are parts of the growth process.

As health equity continues to evolve in public health and society at large, sustained investment in workforce development will remain critical to ensuring that equity goals translate into meaningful, measurable action.

This initiative offers a replicable model for public health organizations seeking to strengthen internal health equity competencies. As MATCH continues its work with diabetes prevention and management partners nationwide, the internal training program ensures that staff are equipped to lead with clarity, compassion, and confidence in an increasingly complex and politically charged environment. Long-term success in advancing health equity depends not only on strong external programming but also on the readiness and resilience of the workforce that supports it. ■

REFERENCES

American Diabetes Association. Standards of medical care in diabetes—2023. Diabetes Care. 2023;46(suppl 1):S1-S322. doi:10.2337/dc23-SINT

Centers for Disease Control and Prevention. National diabetes statistics report. U.S. Department of Health and Human Services. Published 2022. https://www.cdc.gov/diabetes/data/statistics-report/index.html

Innovation *Through* Evidence

Introducing the **ADCES 2026-2028** Research Agenda

JENNIFER L. ROSSELLI, PHARMD, BCACP, BC-ADM, CDCES

The Association of Diabetes Care & Education Specialists (ADCES) has long recognized that advancing diabetes care and education requires more than implementing best practices; it demands a commitment to generating new evidence and translating research into practice. Building on this foundation, the newly released 2026-2028 ADCES Research Agenda offers a strategic framework designed to guide diabetes care and education specialists (DCESs) toward impactful clinical inquiry, addressing critical knowledge gaps, and driving innovation across diverse practice settings.[1] This new agenda operationalizes the priorities outlined in the 2022 Research Agenda and is closely aligned with the ADCES Strategic Plan, emphasizing 3 core goals:

- improving access to diabetes care and education,
- advancing the expertise of DCESs, and
- growing and diversifying ADCES membership with a focus on team-based care diversity.[1-3]

Each goal is supported by targeted research priorities and sample questions designed to inspire inquiry at all levels. These priorities underscore the essential role of evidence in shaping sustainable, equitable, and whole-person diabetes care.[1]

The Evolving Role of the DCES: From Educators to Innovators

The release of the new research agenda follows a pivotal conversation within the specialty, captured in the three-part *ADCES in Practice* series, "From Educators to Innovators." Part 1 introduced the concept of clinical inquiry and highlighted its benefits for improving care, emphasizing the DCES's unique position to ask practice-informed questions and apply evidence-based methods to address unmet clinical needs.[4] Part 2 explored evidence-based quality improvement (EBQI) as a practical, systematic approach for integrating evidence into quality improvement initiatives that drive equitable and sustainable changes in care delivery.[5] Part 3 culminated this progression by outlining the diverse types of research relevant to diabetes care and education. It underscored the importance of DCES-led research in advancing the science of diabetes care and education, from case reports to implementation science, in generating generalizable knowledge that informs practice, policy, and workforce development.[6]

Shaping the Next Era of Research

The 2022 ADCES Research Agenda established 4 foundational pillars—Diversity and Equity, Health Economics and Policy, Implementation Science, and Workforce Development—and called for translational research to close gaps in access, cost-effectiveness, and implementation of diabetes self-management education and support (DSMES).[2] These priorities remain integral to the new agenda. The 2026-2028 Research Agenda builds on this foundation by transforming these pillars into focused priorities and emerging areas of inquiry. It offers practical research questions that address evolving challenges and evidence gaps in diabetes care, questions that DCESs can explore at various levels of clinical inquiry. Topics include cost-effective staffing models for DSMES programs, effective methods for teaching diabetes technology, and the relationship between DCES responsibilities, compensation, and job satisfaction. These examples illustrate how the new agenda transitions from vision to execution, inspiring projects ranging from local EBQI initiatives to multisite research studies. This approach ensures that DCESs can make meaningful contributions and have the opportunity to shape the future of diabetes care and education by generating impactful evidence regardless of their setting or experience level.[1]

Together, the "From Educators to Innovators" series and the 2026-2028 Research Agenda articulate a clear vision: DCESs are not only educators and clinicians but also innovators, leaders, and catalysts for change. The specialty has the capacity to generate evidence and translate it into practice. By engaging in EBQI and research, DCESs can identify and address practice gaps, develop and evaluate interventions, and advocate for policies that enhance access, equity, and quality of care. These activities strengthen the evidence base for DSMES, inform reimbursement and policy decisions, and elevate the visibility and impact of the DCES role within health systems and communities.

A Call to Action

As you engage with this agenda, consider how its priorities intersect with your own practice questions and professional aspirations. The call to action is clear: embrace clinical inquiry,

contribute to research, and help transform diabetes care through evidence-based innovation. ADCES stands ready to support these efforts through resources, mentorship, and platforms for dissemination. Together, we can advance the science, strengthen the specialty, and improve outcomes for people living with or at risk for diabetes. ■

Acknowledgments

The author would like to thank Melanie Xanttopoulos, proposal development coordinator at ADCES, for her valuable support and collaboration during the development of this article as well as the authors of the "From Educators to Innovators" series, Jorden Rieke, Megan Visser, Rebecca Barber, Lisa Letourneau-Freiberg, Michelle Magee, Nancy Allen, and Carine Nassar, for their contributions to advancing the role of DCESs in clinical inquiry, EBQI, and research.

REFERENCES

1. Association of Diabetes Care & Education Specialists. 2026-2028 research agenda. Accessed March 23, 2026. https://www.adces.org/practice/diabetes-research

2. Association of Diabetes Care & Education Specialists. 2022 research agenda. Accessed March 23, 2026. https://www.adces.org/docs/default-source/research/adces-research-agenda.pdf

3. Association of Diabetes Care & Education Specialists. 2024-2028 strategic plan. https://www.adces.org/docs/default-source/handouts/aboutus/2026-strategic-plan-goals.pdf?sfvrsn=5ca09d59_1. Date accessed: April 1, 2026

4. Rieke J, Visser M, Barber R, et al. From educators to innovators: part I: the case for diabetes care and education specialists in clinical inquiry. *ADCES in Practice.* 2025;13(4):64-68.

5. Barber R, Allen NA, Rieke J, et al. From educators to innovators: part 2: empowering the DCES as a Leader in evidence-based quality improvement. *ADCES in Practice.* 2025;13(5-6):44-48.

6. Visser M, Rosselli JL, Letourneau-Freiberg L, et al. From educators to innovators: part 3: advancing diabetes care through research. *ADCES in Practice.* 2026;14(1):60-64.

Sage Premier

Online access to over 900 Sage journals in business; humanities and social sciences; and science, technology, and medicine...

The **Sage Premier** package includes leading international peer-reviewed titles, including high-impact research journals published on behalf of 350 scholarly and professional societies. Our journals cover a wide range of subject areas—including business; humanities and social sciences; and science, technology, and medicine—allowing libraries to support the varied teaching and research needs of their students and faculty.

Sage Premier includes the following:

- access to over 900 Sage journal titles, comprising over 1 million full-text articles;
- access via Sage Journals, now hosted on its new online platform;
- complimentary access back to 1999, where available, while a current subscription is maintained; and
- Article-level metrics offer valuable insights into a researcher's contribution to the discipline and the wider community.

For more information, please visit **sagepub.com/sage-journals-packages** or contact **librarymktg@sagepub.com**

Sage Journals

SPOTLIGHT

Breakthrough T1D
(Formerly JDRF)

Breakthrough T1D (formerly JDRF) is the leading global type 1 diabetes (T1D) research and advocacy organization. With a mission to accelerate life-changing breakthroughs to cure, prevent, and treat T1D and its complications, no organization does more to improve everyday life with T1D. Since its founding in 1970, Breakthrough T1D has committed more than $2.5 billion in research grants. Our research has 2 core objectives:

- Cure T1D by restoring the body's ability to make insulin and stopping T1D before it occurs or providing insulin independence through replacement with insulin-producing cells.
- Improve lives by keeping people with T1D as healthy as possible until cures are found by advancing new T1D resources, technologies, and therapies.

Breakthrough T1D has had a hand in the development of nearly every T1D advancement over the past 50+ years and will continue to fund the best research until this disease is a thing of the past.

From the day of diagnosis to daily life decades later, Breakthrough T1D supports and connects people in the T1D community. While we drive toward curing T1D, we help make everyday life better for the people who face it. Whether you are interested in joining an educational summit, in need of advice from someone who has been there, or are looking for resources—to learn T1D basics, how to educate others about T1D, and where to find more information and support—Breakthrough T1D is ready to help, at any age or stage of T1D.

- **Navigating a T1D diagnosis?** Breakthrough T1D has free resources for children, teens, and adults. The Breakthrough T1D Bag of Hope supports children ages 0 to 11 and their families with educational tools, books, and a very special friend, Rufus the Bear with Diabetes, Powered by Breakthrough T1D. Rufus has special patches to interact with a free mobile companion app that can open up a new world of learning and playing for caregivers and their children. Teen Packs, designed for teens ages 12 to 17 and their caregivers, offer educational resources, a diabetes supply pouch, and a special Lokai bracelet. Adult Packs for individuals 18 years and older provide information to help adults live well with T1D. All 3 packs are also available as bilingual packs (English and Spanish).

  Ready to share these free resources with your patients? Health care providers are critical partners in connecting patients to Breakthrough T1D resources. To learn more about how you can offer these free resources to your patients, please complete this interest form. A member of the Breakthrough T1D team will contact you to share more information.
- **Interested in learning from experts?** Breakthrough T1D Community Summits are hosted virtually and in person, providing education from T1D experts and real-world storytelling from T1D community members. In-person summit events are hosted by Breakthrough T1D chapters across the country and include keynote speakers, breakout sessions, T1D vendor exhibition, youth and teen programming, and opportunities for connection. Virtual programs are hosted on Breakthrough T1D's social platforms throughout the year, including a full Spanish-language program. View the virtual schedule, watch past virtual sessions, or find a local in-person summit.
- **Looking for community connection?** The Breakthrough T1D Community Forum is a vibrant social network for people with T1D, their families, and their friends. The site is created for—and powered by—the T1D community. Members of this diverse and lively community exchange information, answers, and support. Simply sign up, connect with others, and join the conversation. Additionally, virtual

and in-person meetups are hosted by Breakthrough T1D chapters across the country and are open to all, connecting the T1D community coast to coast. Visit our website to find an event near you.

- **Searching for helpful tools?** Breakthrough T1D's website—breakthrought1d.org—offers a variety of resources for back to school, nutrition, parenting and relationships, daily management, and more. You can also connect with your local chapter to join fundraising programs, sign up to be a volunteer, or attend local events.

In addition to patient and community resources, Breakthrough T1D supports health care professionals with clinical guidance tools, accredited education, and more. Closing the gap between access to and adoption of T1D therapies is a mission priority for Breakthrough T1D. Our Medical Affairs unit focuses on:

- Developing educational materials for health care professionals in the United States and around the world. Discover complementary resources available to health care professionals, including accredited education, here.
- Empowering people with type 1 diabetes (T1D) to participate in shared decision-making with their health care teams about emerging T1D therapies.
- Helping to establish and socialize clinical care guidelines tailored to regional needs.
- Expanding clinical trial participation through community activation and health care professional education. Visit our Type 1 Diabetes Early Detection and Clinical Trials pages to learn more about these programs and how you can encourage participation among your patients.

Breakthrough T1D collaborates with ADCES at both the national and state levels. To connect with your local Breakthrough T1D chapter team, please complete this brief form. ■

Sage

Learning Resources

A complete suite. For supercharging research. Supporting student success. And creating impact.

At Sage, we offer seamless experiences across all of our digital resources, from books, cases, videos, and data to full online courses. We pride ourselves on the quality of our content – in fact, we commission most of it ourselves. It's driven by our deep understanding of the theory and practice of learning, and by our vast experience publishing teaching and research materials. For anyone involved in research, we have the only tool dedicated to social science research skills training. And for anyone studying business, we publish a resource collection with a contemporary global perspective.

- **Sage Data**
  Powered by Data Planet
- **Sage Video**
- **Sage Campus**
- **Sage Skills**
- **Sage Business**
- **Sage Research Methods**
- **Sage Reference & Academic Books**
- **CQ Press Library**

sagelearningresources.com

Who Should CaRe? Me!

The Role of the CDCES in the Cardio Renal and Metabolic (CaRe Me) Continuum

KATELYN O'BRIEN, PHARMD, BCPS, CDCES, BC-ADM

I am thrilled to be named the Diabetes Care and Education Specialist (DCES) of the Year for 2026. Thank you to ADCES for the recognition. Part of the role is to speak at coordinating body meetings about topics that I am passionate about as a pharmacist and DCES. One of those topics is about addressing cardio renal and metabolic conditions in type 2 diabetes (T2D) and mitigating therapeutic inertia (TI) as it relates to this topic.

There are more than 38 million Americans living with diabetes.[1] Of the adults living with diabetes, 89.8% have either overweight or obesity according to the Centers for Disease Control and Prevention (CDC). Other alarming statistics include the following:

- More than 70% of adults with diabetes have hypertension, and nearly 40% have chronic kidney disease (CKD).[1]
- More than 47% have an A1C >7%.[1]
- Of nearly 8 million hospital discharges in 2020 with any diagnosis related to diabetes, 1.68 million discharges were attributed to major cardiovascular diseases.[1]
- In 2020, only 11% of the adult population living with diabetes met "ABC" goals of A1C <7%, blood pressure <130/80 mmHg, and non-HDL cholesterol <130 mg/dL.[1]
- Despite the advancements in diabetes technologies and diabetes therapeutics,

there are still disparities in these glycemic outcomes.

How can certified DCES (CDCES) help to improve these outcomes?

Guideline Recommendations

According to the American Diabetes Association (ADA) 2025 Standards of Care, a person-centered, shared decision-making approach should guide the choice of glucose-lowering medications for adults with T2D.[2] Medication should be selected that will provide sufficient effectiveness to achieve and maintain intended treatment goals with consideration of the effects on cardiovascular, kidney, weight, and other relevant comorbidities; hypoglycemia risk; cost and access; risk for adverse reactions and tolerability; and individual preferences.[2] The largest emphasis for patients with cardiovascular-kidney-metabolic (CKM) comorbidities will be on treatment selection of sodium glucose cotransporter 2 inhibitor (SGLT2i), a glucagon-like peptide-1 receptor agonist (GLP-1 RA), or dual agonist GLP-1 RA with glucose dependent insulinotropic polypeptide (GIP).[2] See Table 1 for an outline of recommendations based on CKM comorbidities.

Therapeutic Inertia

TI is the failure to initiate or intensify therapies when treatment goals are not met. TI is evident in diabetes care. As noted earlier with data from the CDC, 47.4% of adults have an A1C >7%, and only 11% meet all 3 criteria for glycemic, blood pressure, and cholesterol targets. TI persists despite well-known microvascular benefits to achieving therapeutic targets and having effective therapies and well-established evidence-based clinical practice guidelines.[3]

Table 1 Pharmacologic Recommendations Based on Comorbidities

CKM Condition	ASCVD or High Risk of ASCVD	HF	CKD	MASLD or MASH	Overweight/ Obesity
ADA recommendation	GLP-1 RA or SGLT2i with proven CV benefits	SGLT2i with proven HF benefit Consider GLP-1 RA or dual GLP-1RA/GIP in HFpEF with obesity	SGLT2i or GLP-1 RA with proven CKD benefit	GLP-1 RA, GLP-1 RA/GIP, pioglitazone	GLP-1 RA or GLP-1 RA/GIP

Abbreviations: ADA, American Diabetes Association; ASCVD; atherosclerotic cardiovascular disease; CKD, chronic kidney disease; CKM, cardiovascular-kidney-metabolic; CV, cardiovascular; GIP, glucose dependent insulinotropic polypeptide; GLP-1 RA, glucagon-like peptide-1 receptor agonist; HF, heart failure; HFpEF, heart failure preserved ejection fraction; MASH, metabolic dysfunction-associated steatohepatitis; MASLD, metabolic dysfunction associated steatotic liver disease; SGLT2i, sodium glucose cotransporter 2 inhibitor.

Table 2 Drivers for Therapeutic Inertia (TI)

People living with diabetes	May be affected by social determinants of health that drive TI if they have limited access to healthy foods, technology, medications, and transportation to appointments, among other barriers.5,6
Clinicians	Often cite time constraints as a limitation and knowledge or awareness of newer guideline recommendations.[5,6] Implicit biases may also impact TI at the level of the clinician. For example, in a study out of the Veterans Administration Healthcare system of nearly 1.2 million patients, Black patients had the lowest odds of prescription compared with White patients for SGLT2i and GLP-1 RA.[7]
Health care system	May fail to identify individuals not meeting targets or may lack resources, such as DSME.[5,6]
Payors	Often have constantly changing formularies or lack coverage of medications, technologies, or DSME.[5,6]

Abbreviations: DSME, diabetes self-management and education; GLP-1 RA, glucagon-like peptide-1 receptor agonist; SGLT2i, sodium glucose cotransporter 2 inhibitor; TI, therapeutic inertia.

A study from the National Health and Nutrition Examination Survey in 2017-2020 looked at 1,375 participants with chronic kidney disease (38%), congestive heart failure (CHF; 8.5%), and atherosclerotic cardiovascular disease (ASCVD; 23%). The overall prevalence of SGLT2i and GLP-1 RA use was 5.8% and 4.4%, respectively. Among adults with CKD, CHF, or ASCVD, SGLT2i was used by 7.7%, and GLP-1 RA was used by 3.5%. Differences in SGLT2i or GLP-1 RA use were observed by age, race, ethnicity, health insurance status, body mass index, and whether a single health care provider was identified as responsible for diabetes management.[4]

There are multiple drivers of TI in clinical practice, and these span many layers of the health care system. Factors influencing TI can stem from

Table 3 CDCES: Preventing Therapeutic Inertia

Level/Area	Strategies to Mitigate TI	Role of the CDCES	Key Examples/Notes
Evidence-based interventions	Engage nonphysician providers (pharmacists, nurses, CDCESs) in medication management using structured protocols.	CDCESs collaborate on therapy initiation/ intensification.	Meta-analysis of 36 studies: nonphysician-led interventions most effective in improving A1C.[8]
Clinical practice level	Create diabetes-dedicated appointments and integrate CDCESs into these visits.[9]	CDCES acts as patient and clinician champion, improving understanding of medication options.	ADA initiative supports diabetes-focused visits to overcome TI.[9]
System level	Develop registries/reports identifying patients not meeting A1C goals.	CDCES collaborates with population health and information technology teams to use data for referrals.	Registries may include labs (eGFR, UMA/UACR) or comorbidities (ASCVD, HF); flags for missing SGLT2i/GLP-1 RA therapy.
Technology and EMR optimization	Build real-time benefit alerts, formulary tools, and embedded order sets.	CDCES supports creation and implementation of EMR-based tools linking to diabetes resources.	Tools connect patients to dietitians, DSME, ophthalmology, nephrology, etc.
Provider education and support	Offer in-services and academic detailing on ADA Standards of Care.	CDCES provides annual training or one-on-one detailing to support PCPs.	Academic detailing helps identify and overcome implementation barriers.
Interdisciplinary collaboration	Alternate visits among MDs, APPs (PA, NP, PharmD), and CDCESs.	CDCES ensures continuity, supports patient follow-up, and addresses barriers.	Reduces appointment bottlenecks; supports early intervention.
Patient-centered support	Screen for diabetes distress, depression, SDOH; provide tailored education.	CDCES assesses psychosocial factors and delivers education to enhance engagement.	Education emphasizes chronic nature of diabetes and progressive treatment needs.
Cultural and language accessibility	Provide multilingual educational materials and instructional videos.	CDCES helps implement educational interventions for diverse populations.	Example: GLP-1RA videos in 4 languages, QR codes in exam rooms, reduced racial/ ethnic prescribing gaps.[10]
Framework implementation	Apply the "identify, configure, collaborate" framework.[11]	CDCES identifies appropriate patients, configures care plans, and collaborates with the team.	Targets patients with obesity, CKD, CHF, ASCVD; promotes shared decision-making.
Medication optimization and education	Support prescribers in initiating and managing cardio-renal-metabolic therapies.	CDCES educates patients on medication timing, side effects, and glucose monitoring.	Enhances uptake and sustained use of evidence-based therapies.

Abbreviations: ADA, American Diabetes Association; ASCVD; atherosclerotic cardiovascular disease; CDCES, certified diabetes care and education specialist; CHF, congestive heart failure; CKD, chronic kidney disease; DSME, diabetes self-management and education; eGFR, estimated glomerular filtration rate; EMR, electronic medical record; GLP-1 RA, glucagon-like peptide-1 receptor agonist; HF, heart failure; PCP, primary care provider; SDOH, social determinants of health self; SGLT2i, sodium glucose cotransporter 2 inhibitor; TI, therapeutic inertia; UMA, UMA/UACR: urinary microalbumin/urinary albumin creatinine ratio

the experiences or circumstances of the person living with diabetes and the constraints faced by clinicians delivering care, which may come from the health care system or payors. Understanding the key contributors to TI can help identify care gaps and lead to targeted interventions to improve timely, evidence-based diabetes care, as shown in Table 2.

Mitigating Therapeutic Inertia

In a meta-analysis of 36 studies categorized by intervention type, it was demonstrated that the most effective approaches to mitigating TI and improving A1C were those that engaged nonphysician health care professionals, specifically, pharmacists, nurses, and DCESs.[8] These nonphysician interventions involved medication management using protocols to initiate or intensify therapy.

There are many ways to combat TI at all levels. CDCESs can act as champions for our patients to help not only the patients but also the clinicians understand medication options and benefits. ADA's Overcoming TI Initiative cites ways to overcome TI by having diabetes-dedicated appointments, which is a perfect way to integrate CDCESs.[9] See Table 3, which highlights the role of the DCES in preventing TI in diabetes care.

Conclusion

People with T2D may experience cardio, renal, and metabolic effects of living with this condition and can benefit from therapeutic agents, such as incretin therapies and SGLT2i, to reduce progression of kidney disease, provide cardiovascular protection, and assist with weight reduction. Despite well-documented benefits of these agents, TI persists. The CDCES is well positioned to educate both patients and practitioners on the benefits of these medications and aim to reduce inertia by identifying patients who would benefit from these medications to reduce complications and improve glycemic outcomes. ■

Author Contributions

KO wrote and edited the manuscript.

Declaration of Conflicting Interests

KO has served on advisory boards for Sanofi, Lilly, and Insulet.

Katelyn O'Brien *https://orcid.org/0009-0006-0213-0919*

REFERENCES

1. Centers for Disease Control and Prevention. National diabetes statistic report. Published May 15, 2024. Accessed September 21, 2025. https://www.cdc.gov/diabetes/php/data-research/index.html

2. American Diabetes Association Professional Practice Committee. 9. Pharmacologic approaches to glycemic treatment: Standards of Care in Diabetes—2025. *Diabetes Care.* 2025;48(suppl 1):S181-S206.

3. Phillips LS, Branch WT, Cook CB, et al. Clinical inertia. *Ann Intern Med.* 2001;135(9):825-834.

4. Limonte CP, Hall YN, Trikudanathan S, et al. Prevalence of SGLT2i and GLP1RA use among US adults with type 2 diabetes. *J Diabetes Complications.* 2022;36(6):108204. doi:10.1016/j.jdiacomp.2022.108204

5. Reach G, Pechtner V, Gentilella R, Corcos A, Ceriello A. Clinical inertia and its impact on treatment intensification in people with type 2 diabetes mellitus. *Diabetes Metab.* 2017;43(6):501-511.

6. Gabbay RA, Kendall D, Beebe C, et al. Addressing therapeutic inertia in 2020 and beyond: a 3-year initiative of the American Diabetes Association. *Clin Diabetes.* 2020;38(4):371-381.

7. Lamprea-Montealegre JA, Madden E, Tummalapalli SL, et al. Association of race and ethnicity with prescription of SGLT2 inhibitors and GLP1 receptor agonists among patients with type 2 diabetes in the Veterans Health Administration System. *JAMA.* 2022;328(9):861-871.

8. Powell RE, Zaccardi F, Beebe C, et al. Strategies for overcoming therapeutic inertia in type 2 diabetes: a systematic review and meta-analysis. *Diabetes Obes Metab.* 2021;23(9):2137-2154.

9. American Diabetes Association. Overcoming therapeutic inertia. Accessed September 21, 2025. https://professional.diabetes.org/professional-development/overcoming-therapeutic-inertia

10. Boston University Chobanian and Avedisian School of Medicine, Barry M. Manuel Center for Continuing Education. Using your GLP-1 or GLP-1/GIP pens: a patient education resource. 2025. Accessed September 20, 2025. https://cme.bu.edu/glp1penteaching

11. Greenwood DA, Howell F, Scher L, et al. A framework for optimizing technology-enabled diabetes and cardiometabolic care and education: the role of the diabetes care and education specialist. *Diabetes Educ.* 2020;46(4):315-322.

Striking Out on My Own

Building a Practice That Fits

SARAH HORMACHEA, MS, RD, CDCES, BC-ADM

Many of us have wondered what it would be like to start our own business, and some of us have taken that step. In this new "ADCES in Practice" column, we share those stories by spotlighting members of the ADCES Entrepreneurship Community of Interest. What motivated them? What challenges did they face? And what did the journey ultimately look like? You will find those answers here.

We begin with Sarah Hormachea, MS, RD, CDCES, BC-ADM, owner and primary consultant of Sarah Hormachea: Diabetes Care and Education, LLC. Sarah provides consultative and contract services to providers, health systems, and community organizations to strengthen diabetes care and education while also offering direct patient services through her private practice. She is the founder and past chair of the ADCES Entrepreneurship Community of Interest and was recently elected to the ADCES Board of Directors. Sarah is based in Denver, Colorado.

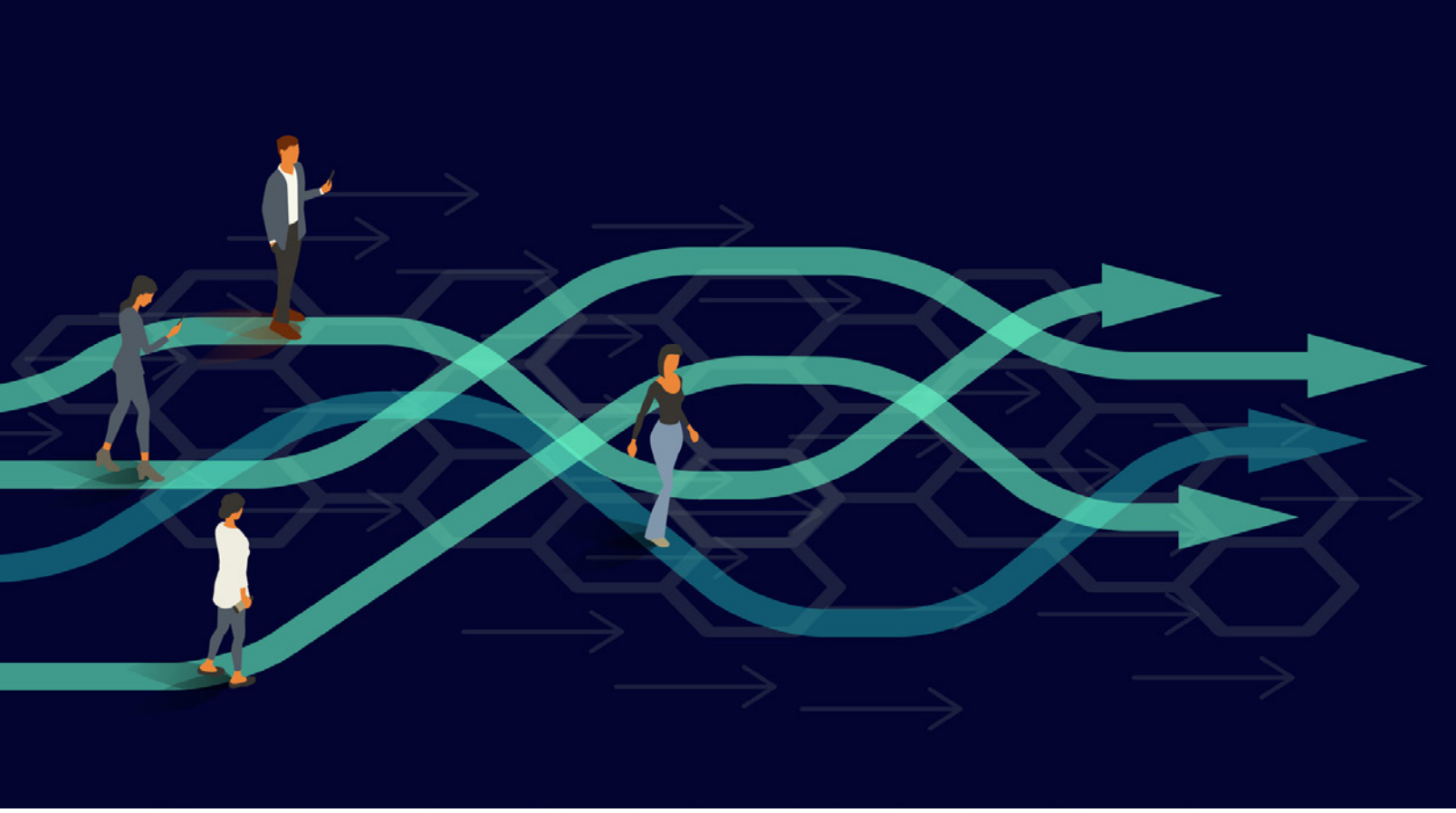
How Did You Get Started?

Choosing to depart from a secure and predictable position in an endocrinology practice at a large teaching hospital was not an easy decision. It came after months of planning, preparation, and prioritizing my professional goals and aspirations. I had to take a close look at what I valued most for myself and my family.

I had just returned from maternity leave, and the days away from my newborn felt especially long. The work itself was emotionally demanding, and my 45-minute commute at the beginning and end of each day, often extended by staying late to address urgent clinic needs or logging in again at night to finish charts, started to take a real toll. I realized I could not maintain healthy boundaries in that environment. I remember thinking, if I can work this hard and feel this motivated for another organization, imagine what I could create and build for myself.

I began researching community and market needs, reimbursement models, and potential revenue streams that could allow me to sustain the income I was earning in my hospital role. I was also looking for something more flexible, work that allowed me to organize my days and weeks in a way that better fit my family's needs.

I spent nights and weekends lining up a few contract opportunities, and once I had the details worked out, I took the leap and left my role in the endocrinology clinic.



Why Did You Choose This Path?

I'm headstrong and independent, and I often joke that I thrive best when I have a long leash. I enjoy creating and building, and I wanted the freedom to take on projects that truly inspire and energize me while stepping away from tasks that left me feeling drained or underutilized, like extensive durable medical equipment (DME) paperwork or spending hours on the phone with pharmacies. Contract and consulting work gave me the opportunity to bring 110% to every project, which is exactly what my clients expect and deserve.

What Does a Typical Day Look Like for You?

The only certainty I have in entrepreneurship is uncertainty. That said, most days start early so I can fit in some exercise and enjoy quality time with my kiddo.

After dropping him off at preschool, I usually head back to my home office for 2 or 3 virtual sessions focused on nutrition therapy or diabetes self-management education and support. My clients come through several pathways. Some are cash-pay and are referred by provider offices or find me directly through my website. I also see insurance-based patients through a platform called Nourish, which manages insurance contracts and credentialing. They also provide direct referrals through their marketing and recruitment efforts and have been an incredible source of infrastructure and support for dietitians working in this space.

My virtual sessions vary and can include reviewing pump or continuous glucose monitor reports and refining recommendations, supporting meal planning and healthy eating with diabetes, or working through behavior change strategies to support broader health and wellness goals.

In the afternoon, I may visit a clinic for an in-person pump training. I currently contract as an independent trainer with 3 different pump companies. On other days, I meet with clinical teams to support the implementation of lifestyle-supported GLP-1 programs. This work may include reviewing InBody scans to help personalize nutrition and exercise recommendations alongside incretin-based therapies, such as Wegovy or Zepbound.

Later in the afternoon, I may hop on a call with an aspiring CDCES to provide clinical coaching. This has become a meaningful and creative revenue stream in my work. Many disciplines, including registered dietitians, can earn employer-

covered continuing education credit by working with a coach or mentor through a customized learning plan. I develop individualized learning plans with clear objectives and applied projects. Sessions can be invoiced directly to employers or paid for by participants, who may then submit for reimbursement.

After spending time with my family, I sometimes log back on in the evening to complete medical reviews, write for a client, or create content for my own website. Every day looks a little different, and that variety is one of the things I enjoy most.

Where Do You Find Joy?

The joy comes from high-quality touchpoints. These are moments when a deeper connection is made and you can feel that the work will bring real value to a program, project, or individual. I love seeing the light bulb go off.

At this point in my career, I am done with hustle culture and the idea that impact or revenue comes from volume alone. Instead, I am intentionally leaning into fewer, higher quality interactions that allow for meaningful work and lasting impact.

What Advice Do You Have for People Considering Striking Out on Their Own?

Do not feel like you need a fully developed business plan, a website, or polished marketing materials to get started. Most people reinvent their services 2 or 3 times before they find what truly works. Even then, it is important to regularly reevaluate your offerings to stay relevant and in demand.

Start by identifying a real problem and thinking through your approach to solving it. Do not try to be everything to everyone. Narrow your focus to a few things you do well and clearly define who benefits most from them and why. Stay flexible in your approach, but do not drift from your north star or guiding mission. That clarity will help you make the right decisions when the time calls for it.

How Do You Stay Afloat?

Emotionally, I am incredibly thankful for my professional colleagues and friends, many of whom overlap. I love meeting up for coffee to talk shop, and I cannot imagine doing this work without the support of professional practice organizations like ADCES, the Academy's Diabetes Practice Group, and the American Diabetes Association. These communities provide daily connection, inspiration, and a space to build meaningful professional relationships that often grow into lasting friendships.

Financially, I have reached milestones I never thought possible, especially in a field where registered dietitians are known to face salary limitations. I am also deeply grateful for my husband, who encouraged me to take the leap and helped shoulder the financial responsibilities, such as health insurance, when I was first getting started. Now, we are in a place where he is preparing to launch his own entrepreneurship endeavor in AI-driven operations, and it feels full circle.

Supporting Entrepreneurship Through Community

For those seeking additional guidance and support, I strongly encourage joining a Community of Interest (COI) that aligns with your career goals and professional needs. When I joined ADCES more than 10 years ago, I became involved not only with my state coordinating body but also with the office- and clinic-based COI and the Technology COI to support my day-to-day practice.

As I began exploring private practice and entrepreneurship, I realized that none of the existing communities fully addressed those needs. In response, I worked with ADCES to help create a new space dedicated to entrepreneurship. This community was designed to offer guidance and support around branding, business development, marketing, professional liability, consulting, private practice growth, postcareer opportunities, and more.

Alongside my co-chair, Baleana Watts-McGilberry, we also used this platform to highlight success stories in the field by launching the

interview series *Interview With an Entrepreneur*. Since its inception in January 2024, the series has featured more than 24 interviews with both familiar and new faces from across the ADCES community. Login to the Entrepreneurship COI to participate in the discussion. ■

Declaration of Conflicting Interests

The author declares having no professional or financial association or interest in an entity, product, or service related to the content or development of this article.

Funding

The author declares having received no specific grant from a funding agency in the public, commercial, or not-for-profit sectors related to the content or development of this article.

Sarah Hormachea
https://orcid.org/0009-0002-5778-2958

Suggested Reading

Giger OF, Pfitzer E, Mekniran W, et al. Digital health technologies and innovation patterns in diabetes ecosystems. *Digit Health*. 2025;11:20552076241311740. doi:10.1177/20552076241311740

Glover WJ, Crocker A, Brush CG. Healthcare entrepreneurship: an integrative framework for future research. *J Business Venturing Insights*. 2024;22:e00476. doi:10.1016/j.jbvi.2024.e00476

Kavookjian J, Bzowyckyj AS, DiNardo MM, et al. Current and emerging trends in diabetes care and education: 2021 National Practice and Workforce Survey. *Sci Diabetes Self Manag Care*. 2022;48(5):307-323. doi:10.1177/26350106221120787

Rodriguez K, Ryan D, Dickinson JK, Phan V. Improving quality outcomes: the value of diabetes care and education specialists. *Clin Diabetes*. 2022;40(3):356-365. doi:10.2337/cd21-0089

Living With Type 1 Diabetes in a 24/7 Profession

ANDREW GOLDEN, MD

BEEP. BEEP. BEEP.

My hand falls naturally to my waist band as it has so many times before. I grab my pager but don't find the "Trauma Activation" I was expecting to see at 2:07 a.m. on this overnight shift as the emergency medicine attending physician at University Hospitals-Cleveland Medical Center. Tonight, our level 1 trauma center and tertiary care center seem to have an unrelenting volume of critically ill patients needing my expertise—a sharp mind and steady hands.

Instead, I replace my pager and instinctively look at the screen next to it. "Sixty-five and dropping," I say, as my insulin pump vibrates in my hands, transmitting data from my continuous glucose monitor (CGM) mounted in my upper arm. I make my way to the "Patient Nourishment" station, grab a couple plastic containers of sugary orange juice, and chug them as I walk to the room of my next patient.

As an assistant professor of emergency medicine and medical education at Case Western Reserve University School of Medicine, I'm excited to share my story as a physician living with type 1 diabetes. But through this piece (and hopefully more!), I hope to detail not only my experiences caring for patients in the emergency department but also my experiences scuba diving, running marathons, and traveling around the world all while using diabetes technologies, a healthy lifestyle, and the expertise of skilled providers like you to keep my blood glucose in range.

The story of hypoglycemia I share here is familiar to us all. Certainly, I've had plenty in my 24 years with type 1 diabetes. What may be different, though, is the consequence. Of course, keeping my blood glucose in range is important for my health. But something I didn't realize as I entered this profession was the importance of keeping them in range for the often 40 patients under my care. My mind needs to be sharp always.

Acute care physicians—those in emergency departments, operating rooms, and intensive care units—throughout the hospital work in unpredictable environments. We never know when the next "emergency" will roll through the door . . . or how many of them there will be. Which means the notion of a lunch break is just that, an often unrealized idea.

People with diabetes thrive with routine. I

intentionally chose a specialty that constantly challenges my intellect, resilience, and health. I do so because I'm excited by the opportunity to connect with patients in their most vulnerable times and care for acutely ill patients. I accept the added pressure of managing my type 1 diabetes knowing it would necessarily add complexity to my work for the rest of my career.

Let me give you a sense of my schedule. Monday, I have a gym class scheduled at 6 a.m., meetings scheduled from 8:00 a.m. until 2:30 p.m., and a shift working in the high-acuity section of my emergency department from 3:00 p.m. until 11:00 p.m. Academic medicine (working in environments with medical students and residents) adds a layer of difficulty to my days that is only made more challenging by concurrently managing a chronic disease. The reality of my career, though, is that most emergency medicine physicians work 15 shifts per month, with about one-third of those being overnight. We are constantly shifting between days, evenings, and nights.

Overnight shifts are the hardest. Certified diabetes care and education specialists and endocrinologists have expertly crafted basal rates, carb ratios, and every other insulin pump setting to best manage my diabetes—in a "normal" diurnal schedule. When that schedule becomes nocturnal, though, things can get a bit unpredictable. The normally higher basal rates required to keep my blood glucose steady while I'm less active from 11:00 p.m. to 7:00 a.m. now cause them to plummet.

The process of learning to manage a fluctuating schedule has been arduous and long. But here are a few tips I've learned along the way. I'm hopeful these may be helpful for other people with diabetes whose schedules lack routine:

1. Have separate insulin pump regimen profiles for both day and night schedules. This will often require more nuance than simply swapping day and night basal and bolus settings for those of us with insulin pumps. For example, I have "Day Shift" and "Night Shift" profiles I swap between on my pump. CGMs are invaluable in helping to identify blood sugar patterns and crafting appropriate insulin strategies. I doubted CGMs for a long time, but this reason alone made me a believer in their power. I wear one constantly now to help with this process alone.
2. Strive to maintain healthy activity, eating patterns, and sleep quality and duration during more challenging times. There's a reason "midnight snacks" are often dessert. The crave for sugar persists when working in the middle of the night. It's easy to jump to quick-hit, high-carbohydrate snacks when energy might be low or to skip physical activity because of insufficient rest. Consistency with these patterns is key for me to optimize in-range blood glucose.
3. Every person with diabetes is different, but I trend toward hypoglycemia when I work overnight. For me, keeping snacks available for these unexpected dips prevents me from sneaking into hospital nutrition rooms to hoard those unappealing orange juice containers. Granola bars and dried fruit are my go-to because they are prepackaged.

Your expertise is invaluable for patients, like me, who lack consistent schedules. I hope this piece sheds light on the struggles we face. In the meantime, "Trauma Activation. MVC. ETA 5 min." And thankfully my glucose is 108 and stable. My mind is sharp and hands steady, ready to go to work. ■

Author Contributions

AG wrote, reviewed, and edited the article.

Funding

n/a

Declaration of Conflicting Interests

AG reports no conflicts of interest.

Guarantor Statement

AG accepts full responsibility for the integrity and accuracy of the finished work

Andrew Golden *https://orcid.org/0000-0002-6345-374X*

The Diabetes Care and Education Specialist's Role in Continuous Glucose Monitoring

We are pleased to announce the newly updated and published practice paper, *The Diabetes Care and Education Specialist's Role in Continuous Glucose Monitoring* (CGM). The following is a summary of the paper. Access the full paper on our website. This is an update of a paper published in March 2021.

CGM represents one of the most transformative advancements in diabetes care in recent decades. Unlike traditional glucose monitoring methods that offer only intermittent snapshots, CGM provides continuous, real-time data that reveal patterns and trends in glucose levels throughout the day and night. This dynamic information enables individuals living with diabetes—and their care teams—to make timely, informed, and evidence-based decisions that reduce glycemic variability, lower A1C levels, and ultimately improve overall health and quality of life.

The clinical use of CGM in both type 1 diabetes and type 2 diabetes is well established. A growing body of evidence suggests that the use of CGM leads to improvements in critical outcomes, including increased time in range, reduced episodes of hypoglycemia, and enhanced diabetes self-management. Beyond its clinical benefits, CGM fosters patient engagement by providing immediate, actionable insights into how behavior, food, stress, and medication affect glucose levels.

The goal of this paper is to highlight that diabetes care and education specialists (DCESs) play a pivotal role in optimizing CGM therapy for both people living with diabetes and clinical practices treating those with diabetes by guiding device selection, onboarding, data interpretation, and behavior change. They are uniquely positioned to bridge technology with person-centered care, empowering individuals and health care professionals to confidently use CGM as a powerful tool for self-management.

CGM has transformed diabetes care, providing individuals with real-time insight into glucose

patterns and enabling more dynamic, informed self-management. As evidence continues to accumulate, CGM is recognized not only as a clinical tool but also as a vehicle for empowerment that facilitates behavioral change and improved quality of life for people with diabetes. DCESs play a central role in maximizing the potential of CGM through support and strategic integration into the self-management education.

The paper covers the following:

- CGM across the life span
  - Pediatrics
  - Pregnancy
  - Older adults
- Barriers and access to CGM use
- DCESs as leader in equity and access
- Role of DCESs in integrating CGM integration into diabetes care
- Integrating CGM with ADCES7 Self-Care Behaviors
- Roles of DCESs in implementing CGM into practice
- Policy and advocacy recommendations.

ADCES gratefully acknowledges the members of the practice paper writing team:

Kristine Batty, PhD, FNP-BC, BC-ADM, CDCES, FADCES

Betsy Rodriguez, BSN, MSN, FADCES

Mary Treadway, MSN, FNP-BC, CDCES, BC-ADM

Claudia Rahim, RD, CDCES

Constance Brown-Riggs, MSEd, RDN, CDCES, CDN

Han-Hung Huang, PhD, PT

Otis Kirksley, PharmD, CDCES, BC-ADM

Emily Sutton, PharmD ■

Test YOUR KNOWLEDGE

Note: Adapted from *Review Guide for the Certified Diabetes Care and Education Specialist Exam*, 6th Edition, (c) 2023. Association of Diabetes Care & Education Specialists. Reprinted with permission.

Answers appear on page 65.

VA is a 56-year-old (BMI 25 kg/m^2; weight 164 lbs) male construction worker with overweight who has returned for follow-up. In addition to his vigorous job, VA plays racquetball 3 to 5 times each week. He continues to smoke 5 cigarettes per day but does not drink alcohol. His past medical history is significant for type 2 diabetes, bladder cancer, hypercholesterolemia, and hypertension. He presents without new complaints today. He currently takes metformin 1 g twice daily, amlodipine 10 mg every morning, rosuvastatin 20 mg at bedtime, and aspirin 81 mg every morning. Today, his blood pressure was 118/74 mm Hg, and his pulse was 68 beats per minute.

Fasting laboratory values today are as follows:

- Fasting plasma glucose: 94 mg/dL
- A1C: 7.7%
- Serum creatinine: 1.1 mg/dL
- Blood urea nitrogen (BUN): 18 mg/dL
- Total cholesterol: 202 mg/dL
- Triglyceride: 186 mg/dL
- LDL cholesterol: 136 mg/dL
- HDL cholesterol: 38 mg/dL
- ACR: 43 mg/g

1 **The health care professional would like to specifically address VA's dyslipidemia at this visit. Which of the following is the most appropriate change to VA's plan?**

A. Increase rosuvastatin to 40 mg at bedtime.
B. Add fish oil 3 g twice daily.
C. Switch rosuvastatin to fluvastatin 40 mg daily.
D. Add ezetimibe 10 mg daily.

2 **The health care professional recently read the REDUCE-IT results and is now considering adding an omega-3 fatty acid to VA's plan. Which of the following is true regarding treatment with omega-3 fatty acids?**

A. Omega-3 fatty acids impair glucose tolerance and are contraindicated in people with diabetes.
B. Gemfibrozil is a better choice for individuals on statin therapy with high triglycerides.
C. Cardiovascular benefits cannot be extrapolated to omega-3 fatty acids other than icosapent ethyl.
D. Plant-based omega-3 fatty acids (flax seed) are preferred for persons with diabetes.

3 **A year later, VA returns for follow-up. He takes metformin, empagliflozin, and liraglutide for his diabetes and has an A1C of 7.5%. Which of the following is the most appropriate change to his plan?**

A. Stop metformin and switch to insulin glargine twice daily.
B. Continue metformin 1 g twice daily and add insulin glargine at bedtime.
C. Decrease metformin to 500 mg every morning and add insulin glargine at bedtime.
D. Make no changes; VA is at his glycemic goal.

4 **VA heard on the news that calcium channel blockers increase mortality in people with diabetes, so he stopped taking amlodipine. What is the best treatment plan for VA's hypertension?**

A. Start clonidine 0.3 mg 3 times daily.
B. Start irbesartan 150 mg daily.
C. Start hydrochlorothiazide 100 mg daily.
D. His blood pressure is fine where it is, so stop all antihypertensives.

Propel Your Future to New Heights

Earn the most recognized credential in diabetes care and education

Certification as a Certified Diabetes Care and Education Specialist® (CDCES®) will:

- Demonstrate your diabetes-specific skills and expertise
- Show your commitment to excellence
- Help you distinguish yourself among health professionals
- Enhance your career opportunities and marketability
- Optimize health outcomes for people with diabetes

A career in diabetes care and education is in ***high demand!***

847.228.9795
info@cbdce.org
www.cbdce.org

SCAN ME

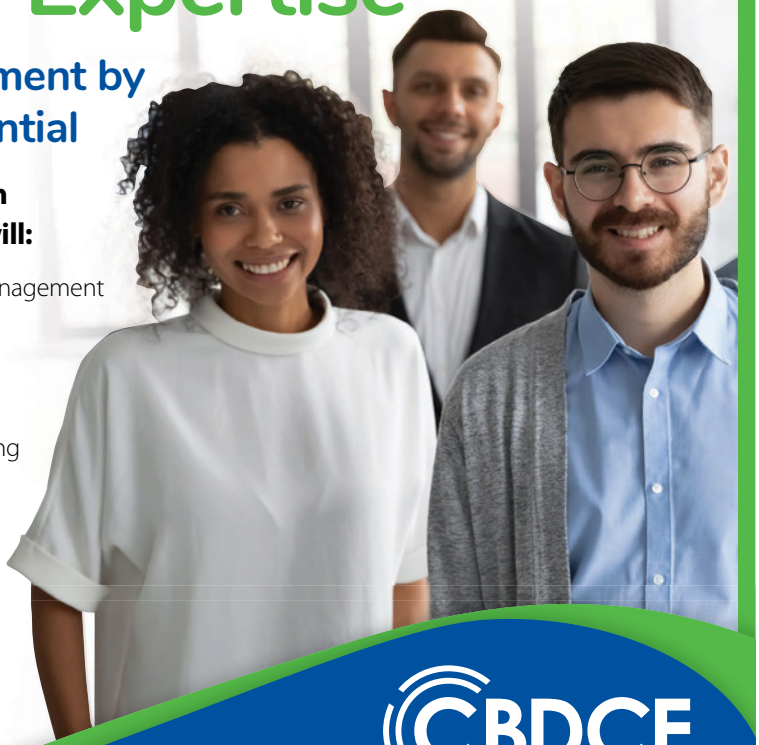
CBDCE
Certification Board for Diabetes Care and Education

Showcase Your Expertise

in Advanced Diabetes Management by Obtaining the BC-ADM® Credential

Health professionals who are Board-Certified in Advanced Diabetes Management (BC-ADM®) will:

- Demonstrate expertise in diabetes management
- Adjust medications
- Treat and monitor acute and chronic complications
- Provide lifestyle modification counseling
- Address psychosocial issues'
- Participate in research and mentoring



Download the BC-ADM Exam Handbook!

Visit www.cbdce.org

CBDCE
Certification Board for Diabetes Care and Education

Test Your Knowledge Answers

Questions appear on page 64.

1. **D:** Add ezetimibe 10 mg daily is correct. Calculating the ASCVD (atherosclerotic cardiovascular disease) risk for VA reveals a 10-year risk of 31%. Although he is appropriately treated with a high-intensity statin based on American Diabetes Association 2023 Standards of Care, his response to drug therapy is not adequate. The 2018 ACC/AHA Guideline on the Management of Blood Cholesterol identifies thresholds of >50% reduction of LDL cholesterol from baseline, or LDL cholesterol <70 mg/dL or non-HDL cholesterol <100 mg/dL for VA with ASCVD and high-risk factors (eg, diabetes). Doubling the dose of rosuvastatin (A) will only achieve an additional LDL reduction of 6%, which will not get VA to goal. Fluvastatin (C) is a less potent statin, so switching will not achieve VA's LDL goal. Fish oil (B) affects triglycerides but not LDL cholesterol.

2. **C:** Cardiovascular benefits cannot be extrapolated to omega-3 fatty acids other than icosapent ethyl is correct. The Reduction of Cardiovascular Events with Icosapent Ethyl-Intervention Trial (REDUCE-IT) enrolled 8179 adults with diabetes and moderately elevated triglycerides to icosapent ethyl 4 g per day or placebo. Individuals who received icosapent ethyl had a 25% relative risk reduction in the primary composite cardiovascular endpoint. Although omega-3 fatty acids have been shown to safely reduce triglycerides in persons with diabetes (A), the results of REDUCE-IT cannot be extrapolated to other products (C). Gemfibrozil inhibits glucuronidation of statins, resulting in statin accumulation and an increased risk of rhabdomyolysis, and thus should not be prescribed concomitantly (B). Only marine-based omega-3 fatty acids have been shown to be effective in reducing triglyceride levels (D).

3. **B:** Continue metformin 1 g twice daily and add insulin glargine at bedtime is correct. The A1C goal of therapy for VA is <7% per the American Diabetes Association 2023 Standards of Care. Because VA is above his A1C goal, intensification of therapy is necessary (D). Metformin continues to be effective throughout the lifetime of a person with type 2 diabetes and should be retained in the absence of contraindications (A). The optimal dose of metformin is 1000 mg twice daily, so decreasing the dose is inappropriate for VA (C).

4. **B:** Start irbesartan 150 mg daily is correct. The blood pressure goal for VA is <130/80 mm Hg (D) due to his ASCVD according to the American Diabetes Association's Standards of Care. Diabetes is a compelling indication to use ACE (angiotensin-converting enzyme) inhibitors or ARBs (angiotensin II receptor blockers) as first-line agents to achieve blood pressure goals due to their ability to preserve kidney function in this individual with ACR 43 mg/g. Hydrochlorothiazide is also considered a first-line agent to treat hypertension; however, the dose should be limited to <25 mg daily to avoid worsening insulin resistance (C).

Sage Author Services

Get the support you need to get published

Ensure your next research paper meets format, language, and style requirements by working with qualified subject area experts.

Sage Author Services provides end-to-end publication support with:

- ☑ English Language Editing
- ☑ Translation with Editing
- ☑ Manuscript Formatting
- ☑ Plagiarism Check
- ☑ Infographics & Video Abstracts
- ☑ Artwork Preparation
- ☑ Plain Language Summaries

Get started today

bit.ly/sage_author_services

Recognizing ENDOGENOUS HYPERCORTISOLISM in People with Type 2 Diabetes: An ADCES Online Guide

When type 2 diabetes remains difficult to manage, underlying conditions such as endogenous hypercortisolism may be contributing.

This new ADCES clinical practice guide helps you:

- Understand why hypercortisolism is often overlooked and how to support earlier recognition
- Identify key clinical clues, patterns, and red flags
- Review common presentations, comorbidities, and screening approaches
- Navigate referral, interdisciplinary collaboration, and follow-up care
- Explore treatment goals, management options, and shared decision-making
- Access practical tools to strengthen awareness in clinical practice

Scan to view Clinical Practice Guide

Educational grant support for this series provided by Corcept Therapeutics.

danatech®
DIABETES TECHNOLOGY @ ADCES

Diabetes Tech Shouldn't Be Out of Reach:

danatech from ADCES Introduces Its New Affordability Program Finder

Our easy-to-use Diabetes Technology Affordability Program Tool helps healthcare professionals like you quickly identify cost-saving options for diabetes technology including CGMs, insulin delivery systems and smart pens, all in one place.

- Find discounts, copay cards, patient assistance programs and more.
- Empower your patients with accessible care.
- Save time with one central resource.

» **danatech.org**

Scan the QR code to explore this tool and find options to help your patients get the tech they need today.

ADCES®

This tool was made possible thanks to a grant from The Helmsley Charitable Trust.