



2022 National Standards for Diabetes Self-Management Education and Support

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By the most recent estimates, 34.2 million people in the U.S. have diabetes (1). At the same time, 88 million people are at increased risk for developing type 2 diabetes. The U.S. also sees an increasing prevalence of both type 1 and type 2 diabetes in children and adolescents (2). Thus, more than 122 million Americans are at risk for developing devastating complications associated with chronic hyperglycemia (1). Diabetes self-management education and support (DSMES) is a critical element of care for all people with diabetes (PWD). “The purpose of DSMES is to give PWD the knowledge, skills, and confidence to accept responsibility for their self-management. This includes collaborating with their healthcare team, making informed decisions, solving problems, developing personal goals and action plans, and coping with emotions and life stresses” (3). DSMES interventions include activities that support PWD to implement and sustain the self-management behaviors and strategies to improve diabetes and related cardiometabolic conditions and quality of life on an ongoing basis. Despite progress in diabetes treatment modalities, glycemic and cardiometabolic outcomes continue to decline in the U.S. (4). Now, more than ever, the provision of DSMES is a vital component of the full treatment for diabetes.

PWD are at risk for distress, life stress, and clinical depression, which can lead to poor health outcomes (5). The National Standards for Diabetes Self-Management Education and Support (hereinafter referred to as the National Standards) encourage the DSMES team to acknowledge and address the emotional burden of living with and managing diabetes—diabetes distress—and to consider the multitude of daily demands and decisions required of PWD, their families, and caregivers (6–9). To further illustrate, PWD generally visit their primary care physician (PCP)/other qualified healthcare professional two to four times per year, where the average appointment lasts 15–20 min and addresses four or more health conditions (10). This equates to the person with diabetes (PWD) spending less than 1% of their life with their healthcare professionals (10). Therefore, diabetes management decisions largely fall on PWD and/or caregivers, further highlighting the importance of increasing access to DSMES services that support ongoing self-management and decision making.

The National Standards define timely, evidence-based, quality DSMES services that meet or exceed the Centers for Medicare & Medicaid Services quality standards. While the acronym DSMES is used in the literature and in current practice, it is important to note that the term diabetes self-management training (DSMT) is exclusively used when describing the Medicare benefit for diabetes self-management. The Medicare benefit for DSMT was established by the Balanced Budget Act (BBA) of 1997 with a final rule (65 FR 83130) published on 29 December 2000, implementing the BBA provisions and DSMT regulations (Title 42 of the Code of Federal Regulation sections 410.140 to 410.146). The DSMT benefit has reimbursement guidelines outside of the National Standards.

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The National Standards provide guidance and evidence-based, quality practice for all DSMES services, including those with no plan to seek reimbursement. The evidence supporting the 2022 National Standards clearly identifies the need to provide person-centered services that embrace cultural differences, social determinants of health (SDOH), and the ever-increasing technological engagement platforms and systems. Because the National Standards aim to promote health equity, technological advancements can often be used to achieve equitable access to DSMES (11); however, technology is not a requirement for delivery of DSMES.

Payers are invited to review the National Standards as a tool to inform and modernize DSMES reimbursement requirements and to align with the evolving needs of PWD and physicians/other qualified healthcare professionals. In the U.S., less than 5% of Medicare beneficiaries with diabetes and 6.8% of privately insured people with diagnosed diabetes have utilized DSMES services (12–14). The American Diabetes Association (ADA) and the Association of Diabetes Care & Education Specialists (ADCES) strongly advocate for health equity to ensure all PWD have access to this critical service proven to improve outcomes, both related to and beyond diabetes. Numerous studies have proven the benefits of DSMES, which include improved clinical outcomes and quality of life, while reducing hospitalizations and healthcare costs (13, 15–19). Engagement in DSMES services lowers hemoglobin A1C (A1C) by at least 0.6%, as much as many diabetes medications—however with no side effects (15). Greater A1C reductions have been associated with more than 10 h of DSMES services (15).

The 2022 National Standards update is meant to be a universal document that is easy to understand and can be implemented by the entire healthcare community. DSMES teams in collaboration with

primary care have been shown to be the most effective approach to overcome therapeutic inertia (20). While the National Standards can be implemented in any care setting, the Chronic Care Model (CCM), which replaced the Acute Care Model as a leading practice in the 1990s, focuses on proactively managing chronic diseases (21). Additionally, Minimally Disruptive Medicine (MDM) is a person-centered approach to healthcare that prioritizes the PWD's self-determined and self-chosen goals for life and health while minimizing the healthcare disruption on their lives. The goal of MDM is to maximize outcomes for the PWD without additional burden; this approach can be incorporated with the CCM and diabetes self-management to reduce complexity (22,23).

The National Standards are applicable to all care models, including solo practice, community, large practice, technology-enabled models of care, and others (24). The National Standards can provide structure and consistency to the coordination of care and population health. DSMES services are not limited to fee-for-service billing to the Centers for Medicare & Medicaid Services and can utilize other financial models, such as value-based payments and collaboration with commercial payers for sustainability (25,26).

DSMES services must be supported and broadly incorporated in emerging models of care, including Accountable Care Organizations, Patient-Centered Medical Homes, Population Health Programs, and value-based payment models (27–29). The National Standards are the basis for recognition by the ADA and accreditation by the ADCES, the two accrediting organizations certified by Medicare (30,31). The National Standards also serve as a guide for all members of the care team as well as insurance providers to ensure PWD receive DSMES services that are evidence-based and up to date.

The authors and collaborating organizations involved in the revision of the

2022 National Standards urge payers, physicians/other qualified healthcare professionals, advocates, and supporters of DSMES to acknowledge and address the evolving complexities within the healthcare landscape (3,32). This revision again reinforces the essential need for person-centered DSMES services offered throughout the life span of a PWD instead of a rigid program structure. The National Standards do not endorse any one approach, but rather seek to delineate the commonalities among effective and evidence-based DSMES strategies. Since the last revision, the terminology for the Diabetes Educator has changed to the Diabetes Care and Education Specialist. The Diabetes Care and Education Specialist is “A compassionate teacher and expert who, as an integral member of the care team, provides collaborative, comprehensive, and person-centered care and education for people with diabetes” (33,34). The new title more accurately reflects this range of diverse skills and specialization and conveys the broad clinical management skill set and the expanded role of technology. The Certification Board for Diabetes Care and Education also changed Certified Diabetes Educator (CDE) to Certified Diabetes Care and Education Specialist (CDCES) in recognition of this change and conveys the level of expertise held by those with this credential (33).

GUIDING PRINCIPLES FOR THE 2022 REVISION OF THE NATIONAL STANDARDS

Due to the dynamic nature of healthcare and diabetes research, the National Standards are reviewed and revised approximately every 5 years by key stakeholders and experts within the diabetes care and education community. For each revision, the Task Force is charged with reviewing the current National Standards for appropriateness, relevance, and scientific basis and making updates based on

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current evidence and expert consensus. In 2021, the group was tasked with reducing administrative burden related to DSMES implementation across diverse care settings. The goal is to increase health equity through access to this critical service while focusing more on person-centered care and decreasing the administrative complexities outlined in previous revisions. The group was also committed to increasing clarity in documentation requirements that enhance communication and continuity of services and reduce ambiguity across all DSMES care team members. As a result, the National Standards have been revised to reduce administrative burden while maintaining the highest quality services for PWD and decreasing burnout for all diabetes healthcare professionals, including the DSMES team. It must be acknowledged that some language contained in the 2022 National Standards revision is from the 2017 National Standards (35). A summary of changes in the 2022 National Standards revision can be found in Supplementary Material 1. For definitions of terms, the National Standards' Glossary can be found in Supplementary Material 2.

STANDARD 1: SUPPORT FOR DSMES SERVICES

The DSMES team will seek leadership support for implementation and sustainability of DSMES services. The sponsor organization will recognize and support quality DSMES services as an integral component of diabetes care. Sponsor organizations will provide guidance and support for DSMES services to facilitate alignment with organizational resources and the needs of the community being served.

Support from the sponsor organizations and internal leadership is crucial for the success of DSMES services. This is needed to overcome the low utilization of DSMES services due to various barriers (e.g., payer, healthcare system, physician/other qualified healthcare professional, individual, environmental, etc.) that impede access to and utilization of DSMES services (3). Support of DSMES services also involves inclusive healthcare teams, which at minimum, include the PWD, the referring physician/other qualified healthcare professional, and the diabetes care and education specialist. The inclusion of and communication between various healthcare team members, specifically diabetes

care and education specialists, has effectively improved diabetes care (20). Ultimately, organizational support of evidence-based DSMES is necessary to ensure that these services are available in the delivery method preferred and accessible and adequately utilized by the PWD. Support could also be from expert stakeholders, who can provide purposeful input and advocacy to promote awareness, value, access, increased utilization, and quality (36,37). Stakeholders can be identified from DSMES participants' referring physicians/other healthcare professionals (within and outside the organization), and community- and affinity-based groups that support DSMES (e.g., fitness clubs and social media networks).

STANDARD 2: POPULATION AND SERVICE ASSESSMENT

The DSMES service will evaluate their chosen target population to determine, develop, and enhance the resources, design, and delivery methods that align with the target populations' needs and preferences.

To best plan, design, deliver, evaluate, and improve quality of services, the DSMES team must identify and understand their target populations' demographics and SDOH (38). Demographic characteristics may include race, ethnic/cultural background, sex, age, geographic location, technology access, levels of formal education, literacy level, health literacy, and numeracy (39–41). The populations' perception of risk associated with diabetes, related complications, and co-occurring conditions (28,42,43) are also key characteristics to consider. This information is available from a variety of sources, including but not limited to community needs assessments by local or state health departments, health system/organizations specific to the populations, and DSMES data.

It is essential to promote access to DSMES services by identifying and addressing population barriers and health inequities (3). Barriers may include socioeconomic, cultural factors, misaligned schedules, health insurance shortfalls, perceived lack of need, or limited encouragement from healthcare professionals to engage in DSMES (28,44,45). SDOH related to the target population should guide service design and delivery (46).

STANDARD 3: DSMES TEAM

All members of a DSMES team will uphold the National Standards and implement collaborative DSMES services, including evidence-based service design, delivery, evaluation, and continuous quality improvement. At least one team member will be identified as the DSMES quality coordinator and will oversee effective implementation, evaluation, tracking, and reporting of DSMES service outcomes.

The DSMES team may include one or a variety of healthcare professionals. The evidence recommends that inclusion of dietitians, nurses, pharmacists, or all other disciplines with special certifications that demonstrate mastery of diabetes knowledge and training, such as Board Certified in Advanced Diabetes Management (BC-ADM) and Certified Diabetes Care and Education Specialists (CDCES), can support all DSMES services, including clinical assessment (24,47).

The quality coordinator needs to ensure the DSMES services are person-centered and understand the process of identifying, analyzing, and communicating quality data. The quality coordinator may partner with other team members to support quality improvement. Although the quality coordinator does not require additional degrees or certifications in informatics, developing an understanding of these skills—as well as marketing, healthcare administration, and business management—will be helpful as the healthcare environment continues to evolve. The quality coordinator role may vary depending on the setting of the DSMES services and may or may not be part of the instructional team.

Other members of the healthcare team, including social workers, Certified Health Education Specialists (CHESs and MCHESs), Exercise Physiologists, Diabetes Community Care Coordinators (previously referred to as paraprofessionals in the 2017 National Standards), and others are also valuable members of the DSMES team. As DSMES team members, Diabetes Community Care Coordinators may include, but are not limited to community health workers, health promoters, dietetic technicians, medical assistants, pharmacy technicians, peer educators, and trained peer leaders. Diabetes Community Care Coordinator team members can provide basic instruction, reinforce self-management skills, support behavior change, facilitate group discussion, provide

psychosocial support, and provide ongoing self-management support (47,48).

To maintain competence and expertise in the expanding diabetes care and education services, all DSMES team members are required to participate in and have documented continuing education, specific to the role they serve within the team (24,47–49). For services outside of the scope of practice of the DSMES team or services, the DSMES team should document communication with referring physicians/other qualified healthcare professionals to support person-centered care.

STANDARD 4: DELIVERY AND DESIGN OF DSMES SERVICES

DSMES services will utilize a curriculum to guide evidence-based content and delivery, to ensure consistency of teaching concepts, methods, and strategies within the team, and to serve as a resource for the team. DSMES teams will have knowledge of and be responsive to emerging evidence, advances in education strategies, pharmacotherapeutics, technology-enabled treatment, local and online peer support, psychosocial resources, and delivery strategies relevant to the population they serve.

The options for delivery of DSMES have grown dramatically in recent years as technology has been incorporated into healthcare, and simultaneously as more people have become comfortable using technology for communication, teaching, and learning. Various modes of delivery can support increased communication between PWD and the DSMES team and improve diabetes-related outcomes. Strong evidence supports DSMES delivery through virtual, telehealth, telephone, text messaging, and web-based/mobile phone applications (apps) (50–55).

The most effective and evidence-based delivery methods move beyond the mere acquisition of knowledge to support informed decision making while addressing psychosocial concerns of the PWD (56,57). The use of interactive teaching styles that include meaningful discussions to address individual questions and needs while fostering a culture of positivity within the DSMES services is recommended. The curriculum content and delivery should be creative, culturally appropriate (58,59), and adapted as necessary for the individuals and groups within the target population (60–64). Furthermore, culturally

tailored services have been shown to be effective in improving diabetes care outcomes (59,65).

A curriculum provides guidance for the DSMES team, effective teaching strategies, and methods for evaluating learning outcomes and includes all aspects of diabetes self-management and support (66–68). DSMES delivery should integrate topics across content areas rather than creating silos of content that limit informed and wise decision making. The delivery of curriculum content must be dynamic and based on continuing assessment of need, preferences, and evaluation of outcomes (66,68–71). Recent education research endorses the inclusion of practical problem solving and self-advocacy approaches, as well as collaborative care, including family and peer support, addressing psychosocial issues, behavior change, diabetes devices, and strategies to sustain self-management efforts (21,24,65,72–78). The ADCES7 Self-Care Behaviors (i.e., healthy coping, healthy eating, being active, taking medication, monitoring, reducing risk, and problem solving) is an evidence-based framework and outline to provide and document diabetes care and education that can be used in conjunction with the chosen curricula (79). A DSMES curriculum must include the following core content areas, and content must be prioritized to meet the individual PWD's current needs and goals (3,15,80,81):

- Pathophysiology of diabetes and treatment options
- Healthy coping
- Healthy eating
- Being active
- Taking medication
- Monitoring
- Reducing risk (treating acute and chronic complications)
- Problem solving and behavior change strategies

DSMES follow-up and ongoing support

While initial DSMES is necessary, it is not sufficient for sustaining a lifetime of diabetes self-management; initial improvements in outcomes have been shown to diminish 6 months after conclusion of the intervention (80). To maintain self-care behavior at the level needed to effectively sustain diabetes management over time, PWD benefit from ongoing diabetes self-management support. On-

going support helps PWD to implement and sustain the ongoing skills, knowledge, coping, and behavioral strategies needed to manage diabetes (3). Because family members, caregivers, and peers can be an effective resource for ongoing support but often don't know how to help, it can be beneficial to include family members and caregivers throughout the DSMES intervention (3). Connecting PWD to technology enabled solutions, such as mobile apps, digital therapeutics, online programs, and peer groups, within the local or online community can encourage practical integration of diabetes self-management and psychosocial support into the existing daily routine between and beyond DSMES sessions.

STANDARD 5: PERSON-CENTERED DSMES

Person-centered DSMES is a recurring process over the life span for PWD. Each person's DSMES plan will be unique and based on the person's concerns, needs, and priorities collaboratively determined as part of a DSMES assessment. The DSMES team will monitor and communicate the outcomes of the DSMES services to the diabetes care team and/or referring physician/other qualified healthcare professional.

To ensure that DSMES is addressing the current concerns, needs, and priorities of the PWD, referring physicians/other qualified healthcare professionals should assess the need for DSMES referral or follow-up at four critical times (3). The four critical times are at diagnosis, annually and/or when not meeting treatment targets, when complicating factors develop, and when transitions in life or care occur (3,66).

Every DSMES intervention should be a person-centered process that addresses timely education and supports individual needs throughout a person's lifetime (3,66,82,83). A DSMES intervention can include individual and/or group sessions and is initiated with an assessment of the PWD's current concerns, needs, and priorities to create a DSMES plan of care guided by the PWD's preferred delivery method and timing. The DSMES plan is implemented through a series of sessions, utilizing a variety of methods, while supporting and tracking related outcomes to identify trends and reinforce effective self-management behaviors (3,66,82). Communicating the progress and related outcomes to the

PWD's diabetes care team contributes to the continuum of person-centered collaborative care and assists in overcoming therapeutic inertia (66,84–86).

Assessment

To implement a person-centered DSMES plan, the Diabetes Care and Education Specialist must closely work in partnership with each PWD to better understand how (e.g., modality, content, and frequency) to best suit that person. The assessment process involves collaborative communication between a healthcare professional and the PWD to identify needs and agree on the PWD's preferred educational, coping, and behavioral interventions that will be used to develop needed problem-solving, decision-making, and self-management skills and strategies (15,87).

Examples of information gathered during the assessment process can include the following:

- Health status: type of diabetes, clinical needs, health history, disabilities, physical limitations, SDOH and health inequities (e.g., safe housing, transportation, access to nutritious foods, access to healthcare, financial status, and limitations), risk factors, comorbidities, and age
- Learning level: diabetes knowledge, health literacy, literacy, numeracy, readiness to learn, ability to self-manage, developmental stage, learning disabilities, cognitive/developmental disabilities (e.g., intellectual disability, moderate-severe autism, dementia), and mental health impairment (e.g., schizophrenia, suicidality)
- Lifestyle practices: self-management skills and behaviors, health service or resource utilization, cultural influences, alcohol and drug use, lived experiences, religion, and sexual orientation
- Psychosocial adjustment: emotional response to diabetes, diabetes distress, diabetes family support, peer support (e.g., in-person or via social networking sites), and other potential promotors and barriers (22,46,84,88–92)

This information can be provided by the PWD as well as obtained from the health record/electronic health record (EHR) and identified support persons or caregivers. This information should be reviewed by the DSMES team to inform and promote person-centered

understanding. The assessment process can be supported by a variety of collection/intake modalities, such as online assessments via consumer portals and EHR, tablet computers that integrate with EHR, text messaging, web-based tools, automated telephone follow-up, and remote monitoring tools (26,93–95). Although not an exhaustive list or applicable to all populations, examples of assessment tools can be found in Supplementary Material 3.

While it would be ideal to have all this information on or before the first session, the realities of the healthcare environment often require the DSMES team to conduct focused assessments in specific areas at the first session and throughout subsequent sessions of the intervention. After the initial assessment, ongoing assessments will be incremental over time based on individual need (3,96). A PWD's concerns and needs change throughout their lifetime due to changes in physical and emotional health, cultural and religious practices, SDOH, the ability to exercise, care support systems, etc. (46,84,89,96).

The assessment can also identify factors that affect the PWD's ability to effectively manage their diabetes that go beyond the scope of practice of the DSMES team. For example, DSMES services play a critical role in closing gaps in care by helping to facilitate necessary referrals (e.g., medical nutrition therapy, social work, psychology, pharmacy, podiatry, optometry, lab tests, specialists, etc.) beyond DSMES that increase access to resources to assist the PWD (88,97–100).

Implementing person-centered DSMES sessions

After the initial assessment, the PWD and DSMES team member(s) develop a person-centered DSMES plan. The ADCES7 Self-Care Behaviors (57) can be used as a base for documentation of the DSMES plan to promote continuity of care with all members of the DSMES team and across DSMES services.

The DSMES team member(s) use person-centered and strengths-based plain language (101), jargon-free and culturally relevant information, language- and literacy-appropriate educational materials (102), and interpreter services when indicated (103). Evidence-

based communication strategies, such as goal setting, action planning, empowerment-based principles and strategies, motivational interviewing, shared decision making, cognitive behavioral therapy, problem solving, self-efficacy enhancement, teach-back method, and relapse prevention strategies are also effective (76,104–107). The DSMES team uses nonjudgmental, nonstigmatizing, and gender-inclusive language when speaking and in writing with and about PWD.

The DSMES plan, topics covered at each session, and the outcomes of the intervention are documented in the DSMES record for each person. This documentation provides evidence of person-centered DSMES and communication among other members of the person's healthcare team. This enhances long-term management and continuity of diabetes care, education, and support (108). Using technology tools and EHRs, in turn, increase access to information for all team members to work collaboratively and have access to documentation (109).

Supporting and tracking person-centered self-management outcomes

Clinical outcome measures reflect the impact of the DSMES services on the health status of the PWD (110). To demonstrate the benefits of DSMES and/or the need for treatment plan adaptation, it is important for DSMES services to measure and track relevant individual outcomes, such as clinical outcomes, patient-reported outcomes, psychosocial outcomes, and behavioral outcomes. Use of patient-generated health data (PGHD) has rapidly increased with wearable devices and apps, and PGHD can assist in setting and tracking outcomes and goals. There is increasing adoption of PGHD diabetes devices, such as continuous glucose monitors (CGMs). For example, CGMs can assist PWD in setting and tracking behavioral and clinical outcomes with real-time feedback for indicators, such as glucose time in, below, or above range and glucose management indicator (111). Incorporating PGHD (112) into decision making individualizes self-management and empowers PWD to fully engage in personal problem solving toward evaluating and changing behaviors and improving outcomes (26,111,113–115).

It is crucial for each PWD to collaboratively develop action-oriented behavior

change plans to reach their personal behavioral goals, coping strategies, and treatment (or clinical) targets (87,116). The DSMES team will explain and demonstrate psychosocial and behavior change strategies that can be used by the PWD to meet their self-determined goals and targets (117). The role of the DSMES team is to provide support in problem solving during this process (118,119). The ADCE7 Self-Care Behaviors (57) can be used for tracking progress in behavior goals.

For some outcomes, the indicators, measures, and timeframes will depend on evidence-based guidelines from professional organizations or government agencies (15,120,121).

STANDARD 6: MEASURING AND DEMONSTRATING OUTCOMES OF DSMES SERVICES

DSMES services will have ongoing continuous quality improvement (CQI) strategies in place that measure the impact of the DSMES services. Systematic evaluation of process and outcome data will be conducted to identify areas for improvement and to guide services optimization and/or redesign.

To demonstrate the benefits of DSMES, members of the DSMES team track relevant individual PWD outcomes (STANDARD 5). Then, these individual outcomes are aggregated to report practice level population outcomes. The diabetes self-management education core outcomes measures (68) specify behavior change as a key outcome, and the ADCE7 Self-Care Behaviors provide a useful framework for assessment, documentation, and evaluation (3,57). The DSMES team should select validated instruments or assessment tools (see Supplementary Material 3) whenever possible and consider utilizing, contributing to, or reflecting upon assessment tools within their organization to accurately track progress and outcomes.

Service models that include population health and disease management, an interprofessional team, and ongoing social support improve both individual-level and aggregated practice-level outcomes (3,122). Formal CQI strategies provide a framework to strive for excellence, quantify successes, and identify future opportunities. In addition, formal CQI strategies are best informed through stakeholder input and have been shown to improve diabetes outcomes (123), which in turn may be used as evidence

to inform payment models and policy for support of DSMES services.

Quality improvement initiatives may target DSMES services at an individual practice, multicenter system, or national DSMES effort level (124). By measuring and monitoring both process and outcome data on an ongoing basis, the DSMES team can identify areas for improvement. They can then adjust engagement strategies and service offerings to optimize outcomes. Evaluation of reach, effectiveness, and adoption achieved via quality improvement initiatives generates evidence to support the business case for maintenance and/or expansion of the DSMES services. Positive results from quality initiatives can be used in marketing efforts and shared with administrators/leadership. A focus on quality is also part of overall healthcare quality initiatives. DSMES services can make a substantial impact on many of the measured outcomes, including the Medicare Access and Children's Health Insurance Program (CHIP) Reauthorization Act (MACRA) and the Quality Payment Program, which have shifted the focus of provider payment from unit of service to quality and outcomes. As an example of promoting quality as an outcome, participating clinicians can be rewarded based on annual predetermined quality measure data, and requirements may change each performance year (125).

Once areas for DSMES services improvement are identified, timelines for data collection with internal audits for verification of data integrity, analysis, and presentation of results can be established.

Outcomes are broadly considered as process data or outcomes data. Outcome data may be clinical, behavioral, patient-reported, and PGHD. Examples for each of these outcome types are provided in **Table 1**. Process outcomes indicate what a healthcare professional does to maintain or improve health (110). They provide information to inform what will lead to desired behavioral and clinical outcomes improvement (e.g., attendance at DSMES sessions, medication taking behaviors, or preventive services involvement) (126). Clinical outcomes indicate the result of the process (e.g., whether treatment or behavioral changes are leading to improvements, such as a change in A1C) and should align with the

greater organizational performance measures, when applicable.

Process outcome measures examine activities driving the most important outcomes of interest from the DSMES services perspective. Process outcome measures generally recommended for DSMES services are operational measures (e.g., characteristics of PWD receiving services, results of marketing efforts, attendance and factors impacting attendance, financial metrics including billing and reimbursement rates, copays, facility fees, PWD and physician/other qualified healthcare professional satisfaction, referrals to DSMES, and attainment rates for recommended diabetes-related surveillance testing). For DSMES services, SDOH must also be considered as process measures because addressing elements of SDOH are necessary for the PWD to achieve optimal self-management and are deemed essential to achieving health equity from the individual PWD, program, and population health perspectives (46).

A wide variety of methods can be used to guide quality improvement initiatives at the individual practice or system levels. The Institute for Healthcare Improvement suggests the Model for Improvement as a framework to guide improvement work (126). The model consists of three fundamental questions that should be answered by an improvement process: 1) "What are we trying to accomplish?" 2) "How will we know a change is an improvement?" and 3) "What changes can we make that will result in an improvement?" (126). Evidence-based examples of such methods include the Plan-Do-Study-Act model, Six Sigma, Lean, workflow mapping, the Re-AIM (127) framework, and the Chronic Care Model (128). There are resources available to assist those initiating quality improvement programs for the first time or for those looking for new options (21,123,126–129). The Centers for Disease Control and Prevention DSMES Technical Assistance Guide (129) and accompanying toolkit (130) also provide guidance for planning and implementing activities to increase use of DSMES services and address quality improvement components. Quality and Performance groups at hospitals and in health systems are also a resource for those embarking on DSMES services quality improvement efforts.

Table 1—DSMES Outcome Examples

Outcome type	Example
Process outcomes	Referral process Attendance Education mapping Social determinants of health Timing of education sessions (e.g., times that meet the PWD needs)
Clinical outcomes	A1C Time in hypoglycemia Pregnancy outcomes LDL-cholesterol levels BMI and body weight Blood pressure Time in range
Psychosocial and behavioral outcomes (57)	Healthy coping Healthy eating Being active Taking medication Monitoring Reducing risk Problem solving
Patient-reported outcomes	Health-related quality of life Diabetes-related quality of life Diabetes distress Self-efficacy Functional status Patient satisfaction
Patient generated health data	Blood glucose trends CGM glucose management indicator Weight, activity, steps Food/beverage intake Sleep Blood pressure

CONCLUSIONS

In keeping with the theme of MDM and recognition of the specialist role of the Diabetes Care and Education Specialist and CDCES, this revision of the National Standards focuses on clarifying key concepts and reducing administrative tasks associated with DSMES services that have little to no impact on person-centered outcomes. While the COVID-19 pandemic and public health emergency have had a major impact on healthcare systems, physicians/other qualified healthcare professionals, and PWD, it is imperative that evidence-based solutions are supported, and that every effort is made across government agencies, payers, and physicians/other qualified healthcare professionals to expand the role of and access to DSMES across the country. As we have learned from the disruption in all aspects of people's daily lives from the COVID-19 pandemic, it is clear that structured DSMES programs do not benefit everyone, and delivery of evidenced-

based, person-centered care is needed to drive quality outcomes. It also reinforces the importance of assessing diabetes distress and promoting the use of healthy coping strategies for effective self-management of diabetes. Alternative methods of delivery, such as one on one audio and audio-video contact, can also improve outcomes similar to in-person DSMES and allow the PWD to choose the option that best meets their needs and preferences.

Evidence supports an expanded role of the Diabetes Care and Education Specialist as an effective change agent in overcoming therapeutic inertia. Research studies show that Diabetes Care and Education Specialists can support intensification of treatment plans to achieve glycemic, blood pressure, and lipid targets through the implementation of diabetes management protocols (131). Furthermore, a recent systematic review and meta-analysis adds to the growing body of evidence that professionals who are not physicians, such as the Diabetes

Care and Education Specialist, are well positioned and should be empowered to initiate and intensify treatment plans when supported by appropriate guidelines (20). Use of digital technology (e.g., cloud-based, telehealth, data management platforms, apps, and social media) enhances the ability to employ a technology enabled self-management feedback loop with four key elements—two-way communication, analysis of PGHD, customized education, and person-centered feedback—to provide real-time engagement in self-management, as well as enable and empower PWD to effectively communicate with their care team (26). Disparities and inequities in access, adoption, and optimization of diabetes technology have become increasingly apparent in the COVID-19 pandemic (11). A framework identified specifically for Diabetes Care and Education Specialists to address these inequities that can be used as a practice model to aid in the incorporation of technology into their DSMES services is the ICC Framework (Identify, Configure, Collaborate) (132, 133). Data support that technology can aid in better outcomes; however, additional assessment and judgement to determine if there are barriers to use and if those barriers can be overcome must be considered (134,135). Other tools are available to assist with implementation and ongoing utilization of diabetes technology (111,136,137).

On a final note, implementation science is an emerging and cost-effective way to study real world methods that promote integration of research and evidence into practice and policy (138). DSMES is an area well established for healthcare professionals to utilize a robust body of evidence to evaluate outcomes, reduce costs, and decrease health disparities while addressing and reducing health inequities.

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