2017 National Standards for Diabetes Self-Management Education and Support

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By the most recent estimates, 30.3 million people in the U.S. have diabetes. An estimated 30.3 million have been diagnosed with diabetes and 7.2 million are believed to be living with undiagnosed diabetes. At the same time, 84.1 million people are at increased risk for type 2 diabetes. Thus, more than 114 million Americans are at risk for developing the devastating complications of diabetes (1).

Diabetes self-management education and support (DSMES) is a critical element of care for all people with diabetes and those at risk for developing the condition. DSMES is the ongoing process of facilitating the knowledge, skills, and ability necessary for prediabetes and diabetes self-care, as well as activities that assist a person in implementing and sustaining the behaviors needed to manage his or her condition on an ongoing basis, beyond or outside of formal self-management training. In previous National Standards for Diabetes Self-Management Education and Support (Standards), DSMS and DSME were defined separately, but these Standards aim to reflect the value of ongoing support and multiple services.

The Standards define timely, evidence-based, quality DSMES services that meet or exceed the Medicare diabetes self-management training (DSMT) regulations, however, these Standards do not guarantee reimbursement. These Standards provide evidence for all diabetes self-management education providers including those that do not plan to seek reimbursement for DSMES. The current Standards' evidence clearly identifies the need to provide person-centered services that embrace the ever-increasing technological engagement platforms and systems. The hope is that payers will view these Standards as a tool for reviewing DSMES reimbursement requirements and consider change to align with the way their beneficiaries' engagement preferences have evolved. Research confirms that less than 5% of Medicare beneficiaries utilize their DSMES benefits (2,3). Changes in reimbursement policies stand to increase DSMES access and utilization, which will result in positive impact to beneficiaries' clinical outcomes, quality of life, health care utilization, and costs (4).

It is necessary to learn how to manage diabetes and prevent or delay the complications (5,6). The Standards are designed to define quality DSMES and assist those who provide DSMES services to implement evidence-based DSMES. Numerous studies have shown the benefits of DSMES, which include improved clinical outcomes and quality of life while reducing hospitalizations and health care costs (2,7–12). Four critical time points for providing DSMES—at diagnosis, annually, when complicating factors occur, and during transitions in care—have been documented and should be used to guide health care professionals' referrals (13). Engagement in DSMES services improves hemoglobin A1C (A1C) by 0.6%, as much as many medications, with no side effects (8). However, greater A1C improvement was associated with DSMES services greater than 10 h (8,11).

The Standards are applicable to educators in solo practice as well as those in large multicenter programs (14), care coordination programs, population health programs,

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and technology-enabled models of care (15,16). By following the Standards, DSMES should be incorporated in new and emerging models of care, including virtual visits, Accountable Care Organizations, Patient-Centered Medical Homes, population health programs, and value-based payment models (17–20). The Standards do not endorse any one approach, but rather seek to delineate the commonalities among effective and evidence-based DSMES strategies. These Standards are used in the field for recognition by the American Diabetes Association (ADA) and accreditation by the American Association of Diabetes Educators (AADE). They also serve as a guide for nonaccredited and nonrecognized providers of diabetes education.

Many DSMES services encounter people who are diagnosed with prediabetes. It is important to note that DSMES and the National Diabetes Prevention Program (National DPP) lifestyle change program are tailored for different audiences with different needs and different desired outcomes. The Centers for Disease Control and Prevention's (CDC) Diabetes Prevention Recognition Program assures that organizations can deliver the lifestyle change program effectively and achieve the outcomes necessary to prevent or delay onset of type 2 diabetes. To achieve CDC recognition, organizations must use a CDC-approved curriculum and meet national quality standards designed specifically for type 2 diabetes prevention programs. Those who deliver DSMES programs are well positioned to also offer the National DPP lifestyle change program, but they should meet the standards for the National DPP (21). The National DPP and DSMES colocated within organizations have been found to be successful and the outcome of this partnership allows for the sharing of expertise and the easy transition from one service to another (22).

This revision of the Standards highlights the focus of the individual with diabetes as the center of their care team, recognizing that a person with diabetes visits their primary care provider (PCP) four times per year on average, and the average PCP appointment is 18–20 min (23). This equates to the person with diabetes spending less than 1% of their life with their health care team accessing services (23). Thus, the focus of the Standards should include helping the person with diabetes develop problem-solving skills and attain ongoing decision-making support necessary to self-manage diabetes. In addition, encouraging e-health tools (24) and online peer support (25) will allow for the implementation of a complete feedback loop essential to facilitate ongoing self-management (16,26). Diabetes also carries with it a risk for burnout, which, as it develops, can lead to poorer health outcomes (27). Health care teams must consider the burden of treatment placed upon those living with diabetes—in essence, the "work of being a patient"—and consider all decisions within the lens of the individual's capacity (28). All DSMES services must focus on the priorities, concerns, and preferred delivery method and timing of the individual incorporating a person-centered approach. The minimally disruptive model of care defines a goal of maximizing participant outcomes with the minimal amount of work required by the person with diabetes to help simplify diabetes management and not add complexity (29).

Previous Standards have used the term *program;* however, when focusing on the needs of an individual, this term is no longer relevant. The use of DSMES *services* more clearly delineates the need to individualize and identify the elements of DSMES appropriate for an individual. This revision encourages providers of DSMES to embrace a contemporary view of the new complexities of the evolving health care landscape (13,30).

Because of the dynamic nature of health care and diabetes-related research, the Standards have previously been reviewed and revised approximately every five years by key stakeholders and experts within the diabetes care and education community. In 2016, the Task Force was jointly convened by AADE and ADA. Members of the Task Force included experts from numerous health care professional disciplines and individuals with diabetes. Representatives from public health; those practicing with underserved populations including rural primary care and other rural health services; virtual, pharmacy, insurer programs; individual practices and large urban specialty practices; and urban hospitals served on the Task Force. The Task Force was charged with reviewing the current National Standards for DSMES for appropriateness, relevance, and scientific basis, and updating them based on the available evidence and expert consensus. Given the rapidly changing health care environment and the ever-growing field of technology, the 2017 Standards Revision Task Force recognizes the potential need to review the literature for evidence-driven updates more frequently in the future as advances in health care delivery are evolving.

STANDARD 1

Internal Structure

The provider(s) of DSMES services will define and document a mission statement and goals. The DSMES services are incorporated within the organization—large, small, or independently operated.

Documentation of a defined structure, mission, and goals supports effective provision of DSMES. Mission defines the core purpose of the organization and assists in developing professional practice and services. Business literature, case studies, and reports of successful organizations emphasize the importance of clear and shared missions, goals, and defined relationships (31,32). The absence of these common goals and relationships is cited as one barrier to success (32). Defined leadership is needed to remove any service-related obstacles and find resources to advance DSMES services (33). Therefore, entities providing DSMES services must develop lines of communication and support to be clear on their mission,

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outcomes, and quality improvement measurement (34). The Chronic Care Model supports the need for documented organizational mission and goals (33).

According to The Joint Commission, documentation of an organization's structure is equally important for both small and large health care organizations (35). Providers of DSMES working within a larger organization will have the organization document recognition of and support of quality DSMES as an integral component to their mission (35). For smaller or independent providers of DSMES, they will identify and document their own appropriate mission, goals, and structure to fit the function in the communities they serve (34).

STANDARD 2

Stakeholder Input

The provider(s) of DSMES services will seek ongoing input from valued stakeholders and experts to promote quality and enhance participant utilization.

The purpose of seeking stakeholder input in the ongoing planning process is to gather information and foster ideas that will improve the utilization, quality, measurable outcomes, and sustainability of the DSMES services. Stakeholders can be identified from DSMES participants, referring practitioners, and community-based groups that support DSMES (e.g., health clubs and health care professionals [both within and outside of the organization]) who provide input to promote value, quality, access, and increased utilization (36,37). Social determinants related to the population served will be used to guide stakeholder selection and facilitate the connection between the DSMES services, the participant population, the health care providers, and the community (38,39).

A planned, documented strategy to engage and elicit input from stakeholders will shape how DSMES is developed, utilized, monitored, and evaluated (33,37,40,41). If the provider of DSMES is experiencing a lack of referrals or low utilization, the stakeholders can assist with the solution (42,43). The goal is to provide effective and dynamic DSMES services that are person-centered, culturally relevant, and responsive to the referring practitioner and participant-identified needs (38), ultimately engaging participants in lifelong learning (13,41).

STANDARD 3

Evaluation of Population Served

The provider(s) of DSMES services will evaluate the communities they serve to determine the resources, design, and delivery methods that will align with the population's need for DSMES services.

Currently, the majority of people with and at risk for diabetes do not receive DSMES (2,3,10,44,45). While there are many barriers to DSMES, one crucial issue is access (46–48). Providers of DSMES, after clarifying the specific populations they are able to serve, must understand their community and regional demographics (47,49–53).

Individuals, their families, and communities require education and support options and tools that align with their needs (54–56). The provider(s) of DSMES must ensure the necessary educational alternatives are available (40,54). Understanding the population's demographic characteristics, including ethnic/cultural background, sex, age, levels of formal education, literacy, and numeracy (57–60) as well as perception of diabetes risk and associated complications is necessary (45).

It is essential to identify the barriers that prevent access to DSMES during the assessment process (61–63). Individuals' barriers may include socioeconomic or cultural factors, participant schedules, health insurance shortfalls, perceived lack of need, and limited encouragement from other health care practitioners to engage in DSMES (15,64–68).

Models that include population health and disease management, an interprofessional team, and ongoing social support improve both practice and individual outcomes (40,69,70). Medical management integrated with DSMES improves access, clinical outcomes, and cost-effectiveness (71,72). Creative solutions incorporating technology to increase reach and engagement must be examined (73,74). Telehealth, electronic health records (EHR), mobile applications, and cognitive computing will proactively identify and track participants while offering endless opportunities for individualized and contextualized DSMES (16,75–78).

STANDARD 4

Quality Coordinator Overseeing DSMES Services

A quality coordinator will be designated to ensure implementation of the Standards and oversee the DSMES services. The quality coordinator is responsible for all components of DSMES, including evidence-based practice, service design, evaluation, and continuous quality improvement.

Ensuring quality is an essential component of the chronic care model (33). Person-centered health care is associated with improved outcomes (79–81) and better relationships between referring practitioners, individuals, and teams (82,83). For DSMES services to be sustainable, quality must be a priority (84,85).

Previous versions of the Standards used the term *program coordinator*; however, with new models of care and payment methods evolving, DSMES services need to demonstrate how these services affect overall participant outcomes. The change to *quality coordinator* reflects the need to address quality within all levels of DSMES services offered, concurrent with implementation. Most importantly, the quality coordinator is charged with collecting and evaluating data to identify gaps in DSMES, providing feedback on the performance of the DSMES services to team members, referring practitioners, and the organization's administration. The use of EHR and person-centric software improves care (86–92) and assists the quality coordinator in evaluating the effectiveness of DSMES. The quality coordinator utilizes data mining to inform payers and members of the health care team of the clinical outcomes of DSMES. Although the quality coordinator does not require additional degrees or certifications in informatics, developing an understanding of these skills—as well as marketing, health care administration, and business management—will be helpful as the health care environment evolves. The quality coordinator does need to understand the process of identifying, analyzing, and communicating quality data. In large health systems, the quality coordinator may partner with other team members to support quality improvement. In most DSMES entities the quality coordinator will manage the overall services and may be part of the instructional team.

STANDARD 5

DSMES Team

At least one of the team members responsible for facilitating DSMES services will be a registered nurse, registered dietitian nutritionist, or pharmacist with training and experience pertinent to DSMES, or be another health care professional holding certification as a diabetes educator

(CDE) or Board Certification in Advanced Diabetes Management (BC-ADM). Other health care workers or diabetes paraprofessionals may contribute to DSMES services with appropriate training in DSMES and with supervision and support by at least one of the team members listed above.

The evidence supports an interprofessional team approach to diabetes care, education, and support (93). Current research continues to support nurses, dietitians, and pharmacists as providers of DSMES responsible for curriculum development (13,14,94–98). Expert consensus supports the need for specialized clinical knowledge in diabetes and behavior change principles for DSMES team members (99). Certification as a CDE (National Certification Board for Diabetes Educators [NCBDE]) (86,100) or BC-ADM (AADE) (86,101) demonstrates specialized training beyond basic discipline preparation and mastery of a specific body of knowledge. All DSMES team members must document appropriate continuing education of diabetes-related content, ensuring their continuing competence in their respective roles.

Registered nurses, registered dietitian nutritionists, pharmacists, and members of health care disciplines that hold a certification as a CDE or BC-ADM can perform all the DSMES services including clinical assessments (14,100–102). Paraprofessionals with additional training in DSMES effectively contribute to the DSMES team. Diabetes paraprofessionals (e.g., medical assistants, community health workers, peer educators, etc.) can instruct, reinforce self-management skills, support behavior change, facilitate group discussion, and provide psychosocial support and ongoing self-management support (102). Paraprofessionals must receive continuing education specific to the role they serve within the team and must directly report to the quality coordinator or one of the qualified DSMES team members (14,71,99,102–106). For services outside the expertise or scope of the DSMES provider, a mechanism must be in place to ensure that the participant is given the information needed to be referred to the appropriate health care professionals (99,107).

STANDARD 6

Curriculum

A curriculum reflecting current evidence and practice guidelines, with criteria for evaluating outcomes, will serve as the framework for the provision of DSMES. The needs of the individual participant will determine which elements of the curriculum are required.

Individuals with diabetes, and those supporting them, have much to learn to enable effective self-management. DSMES provides this education in an up-to-date, evidence-based, and flexible curriculum (108,109). The options for delivery of the curriculum have grown dramatically as technology has been incorporated into health care.

The curriculum is the evidence-based foundation from which the appropriate content is drawn to build an individualized education plan based on each participant's concerns and needs. The curriculum content must be supplemented with appropriate resources and supporting education materials. A curriculum also specifies effective teaching strategies and methods for evaluating learning outcomes (5,110,111). The curriculum must be dynamic (5,97,111–113). Recent education research endorses the inclusion of practical problem-solving approaches and collaborative care, addressing psychosocial issues, behavior change, and strategies to sustain self-management efforts (40,114–120).

The following core content areas, including the AADE7 Self-Care Behaviors, demonstrate successful outcomes (13,109,121,122) and must be reviewed to determine which are applicable to the participant:

- Diabetes pathophysiology and treatment options
- Healthy eating
- Physical activity
- Medication usage
- Monitoring and using patient-generated health data (PGHD)
- Preventing, detecting, and treating acute and chronic complications
- Healthy coping with psychosocial issues and concerns
- Problem solving

The content areas listed, as well as educating the participant on navigating the health care system, learning self-advocacy, and e-health education (24,105,106,115–117), can be adapted for all practice settings and provide a solid outline and agenda for a DSMES curriculum. It is crucial that the content be tailored to match individuals' needs and be adapted as necessary for age, developmental stage, type of diabetes, cultural factors, health literacy and numeracy, and comorbidities (123–127).

STANDARD 7

Individualization

The DSMES needs will be identified and led by the participant with assessment and support by one or more DSMES team members. Together, the participant and DSMES team member(s) will develop an individualized DSMES plan.

People with diabetes should engage in DSMES during various stages after their diabetes diagnosis (5,13). Regardless of the stage, people with diabetes have their own priorities and needs. The DSMES services must be designed using person-centered care practices, in collaboration with the participant, focusing on the participant's priorities and values (5,13,128). The most important element to appreciate is that no participant is required to complete a set DSMES structure. When participants have achieved their goals, they can determine that their *initial* DSMES intervention is complete. However, DSMES is an ongoing, lifelong process, with ongoing assessments of AADE7 Self-Care Behaviors (122) and continual support (5,13).

Research indicates the importance of individualizing DSMES to each participant (129,130). The assessment process is collaboratively conducted by a health care professional with the participant to identify needs and potential self-management support strategies. The health care professional uses the information gleaned on assessment to determine the appropriate educational and behavioral interventions, including enhancing the participant's problem-solving skills (8,11,130). The assessment must incorporate information about the individual's medical history, age, cultural influences, health beliefs and attitudes, diabetes knowledge, diabetes self-management skills and behaviors, emotional response to diabetes, disease burden, ability, readiness to learn, literacy level (including health literacy and numeracy), physical limitations, family support, peer support (in person or via social networking sites), financial status, and other barriers (29,131–134). After the initial assessment, additional assessments can be incremental over time as indicated based on participant need (13).

The DSMES team member(s) will use clear health communication principles,

using plain language, avoiding jargon, making information culturally relevant, using language- and literacy-appropriate education materials, and using interpreter services when indicated (135). Evidence-based communication strategies such as collaborative goal setting, action planning, motivational interviewing, shared decision making, cognitive behavioral therapy, problem solving, self-efficacy enhancement, teach-back, and relapse-prevention strategies are also effective (120,136–139). It is crucial to develop action-oriented behavior change goals and objectives (130,140). Creative, person-centered, experience-based delivery methods beyond the mere acquisition of knowledge are effective for supporting informed decision making and meaningful behavior change and addressing psychosocial concerns (122,141). Moving beyond *static* lecture methodology, incorporating meaningful discussions to address individual needs, and using interactive teaching styles are required. Incorporating PGHD, especially blood glucose and/or continuous glucose monitoring data, into decision making individualizes self-management and empowers participants to fully engage in personal problem solving to change behavior and improve outcomes (16,142–144). There is strong evidence that incorporating text messaging into DSMES interventions improves engagement and outcomes (25,145–147). Use of digital technology (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 individualized feedback to provide real-time engagement in self-management, as well as to enable and empower participants (16).

Reassessment during key times, such as when complicating factors influence self-management and during transitions of care, can determine whether there is need for additional or different DSMES services (13,148). A variety of assessment modalities, including 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 can be used (77,149–152). Selecting validated tools, used for assessment and ongoing evaluation, will generate more evidence to support DSMES (153). Although not an exhaustive list or applicable to all populations, examples of assessment tools can be found in the Standards' glossary (Table 1).

The assessment and education plan, intervention, and outcomes will be documented in the participant's health record. Documentation of participant contact with DSMES team members will guide the education process, provide evidence of communication among other members of the individual's health care team, and demonstrate adherence to guidelines, all of which will assist in long-term management of diabetes care and diabetes self-management support (86). Using technology tools will increase access to information for all team members to work collaboratively and have access to documentation.

STANDARD 8

Ongoing Support

The participant will be made aware of options and resources available for ongoing support of their initial education, and will select the option(s) that will best maintain their self-management needs.

While initial DSMES is necessary, it is not sufficient for participants to sustain a lifetime of diabetes self-management (13,115). Initial improvements in metabolic and other outcomes have been shown to diminish after six months (13,115). To maintain behavior at the level needed to effectively self-manage diabetes, participants with type 1 diabetes (12) and type 2 diabetes (11) need ongoing diabetes self-management support. Ongoing support is defined as resources which help the participant implement and sustain the ongoing skills, knowledge, and behavior changes needed to manage their condition (13). The vital point is that the participant selects the resource or activity that best suits their self-management needs.

A variety of strategies are available for engaging in ongoing support both within and outside DSMES services. Support can include internal or external group meetings (connection to community and peer groups [online or locally]), ongoing medication management, continuing education, resources to support new or adjustments to existing behavior change goal-setting, physical activity programs, weight-loss support, smoking cessation, and psychosocial support among others (154–159). Connecting the participant to existing community resources outside of the DSMES entity is more realistic for smaller organizations.

The effectiveness of providing support through diabetes educators, disease-management programs, trained peers, diabetes paraprofessionals, community-based programs, or through the use of technology (text, e-mail, social media, web-based, mobile, digital, and wearable and wireless devices) has also been established (154–156,160–165). Peer support using social networking sites improves glucose management, especially in people with type 2 diabetes (25). Practitioners can highlight the benefits and accessibility of online diabetes communities as a resource to help participants learn from others living with the condition, facing similar issues, available 24 h a day, seven days a week, when it is convenient for them to engage. A person-centered approach is recommended to incorporate ongoing support plans in clinical care (115,128,166).

STANDARD 9

Participant Progress

The provider(s) of DSMES services will monitor and communicate whether participants are achieving their personal diabetes self-management goals and other outcome(s) to evaluate the effectiveness of the educational intervention(s), using appropriate measurement techniques.

Effective DSMES is a significant contributor to long-term, positive health outcomes and clinical improvement (8). Assessing needs and communicating information and skills that promote effective coping and self-management must involve a personalized and comprehensive approach (13). The provider(s) of DSMES will rely on behavior change goal-setting strategies to help participants meet their personal targets (167). There are proven steps based on goal-setting theory that improve outcomes. The role of the DSMES team is to aid the goal-setting process and adjust based on participant needs and circumstances (168,169). Validly measuring the achievement of SMART goals (specific, measurable, achievable, realistic, and time-bound) and action planning including an assessment of confidence and conviction is essential (170,171).

To demonstrate the benefits of DSMES, it is important for DSMES providers to

Table 1—Glossary of terms

Assessment. A process to gather the information necessary to make a diabetes self-management education and support (DSMES) plan with the participant. The DSMES assessment must be completed by a health care professional.

Assessment Tools.

- The Diabetes Distress Scale (DDS) (short form)
  - A two-question initial screening tool to assess diabetes-specific distress (followed by the full 17-item scale when indicated) (175)
- The WHO (Five) Well-Being Index
  - Validated in many languages, is a reliable measure of emotional functioning and screen for depression and has been used extensively in research and clinical care (176), including the DAWN2 study (Diabetes Attitudes, Wishes and Needs 2) (177)
- Problem Areas in Diabetes (PAID) scale
  - A 20-item measure of diabetes-specific distress identifying emotional distress and burden associated with diabetes (178) (pediatric and teen versions [179,180] are also available)
- Diabetes Self-Efficacy Scale
  - An eight-item self-report scale designed to assess confidence in performing diabetes self-care activities (181)
- Self-Care Inventory-Revised (SCI-R)
  - A survey that measures what people with diabetes do versus what they are advised to do in their diabetes treatment plan (182)
- Summary of Diabetes Self-Care Activities (SDSCA)
  - An 11-item or expanded 25-item measure of diabetes self-care behaviors (183)
- Starting The Conversation (STC)
  - An eight-item simplified food frequency instrument designed for use in primary care and health-promotion settings (184)
- Three-item screen
  - A tool to measure health literacy. It asks how often someone needs help reading hospital materials, how confident they are filling out forms, and how often they have difficulty understanding their medical condition (185)

Behavioral goal setting. The practice of identifying health behaviors to modify, setting a target to reach, and planning a course to achieve the target.

Capacity. The ability a person has to understand and manage their condition.

Cognitive computing. The simulation of human thought processes in a computerized model to mimic the way the human brain works.

Data mining. The ability of a coordinator to aggregate data from within their organization's documentation system.

Diabetes paraprofessional. A person with a nonmedical background who can provide support as a part of a diabetes care team.

Diabetes professional. A person with a medical background who is part of a diabetes care team.

Diabetes self-management education and support (DSMES). The ongoing process of facilitating the knowledge, skills, and ability necessary for prediabetes and diabetes self-care, and the activities that assist the person with diabetes or prediabetes in implementing and sustaining the behaviors needed to manage his or her condition on an ongoing basis beyond or outside of formal self-management training. This process incorporates the needs, goals, and life experiences of the person with diabetes or prediabetes and is guided by evidence-based standards. Support (whether behavioral, educational, psychosocial, or clinical) helps implement informed decision making, self-care behaviors, problem solving, and active collaboration with the health care team and to improve clinical outcomes, health status, and quality of life.

Disease burden. The impact a disease has on the various components of a participant's life, such as physical, financial, or mental aspects.

Electronic health records (EHR). The digital version of a patient's chart. EHR are available in real time and available to patients and their care team immediately.

Goals. The desired results for DSMES, set by those receiving DSMES services and their care teams.

Health care stakeholder. Anyone involved in or affected by the financing, implementation, or outcome of a service, practice, process, or decision made by another (e.g., health care, health policy). Examples of stakeholders with interest in health care are providers, patients (health care consumers), payers, etc.

Mission. Core purpose, direction, and why the organization exists. It describes who it serves and how it does it.

National Diabetes Prevention Program (National DPP). An evidence-based intervention that allows purchasers, payers, and providers to prevent or delay onset of type 2 diabetes in patients with prediabetes or at high risk for type 2 diabetes. The intervention is founded on the science of the Diabetes Prevention Program research study and several translation studies. These studies showed that making modest behavior changes helped participants lose 5 to 7% of their body weight and reduced the risk of developing type 2 diabetes by 58% in adults with prediabetes (71% for people over 60 years of age). The National DPP lifestyle change program is a year-long structured program (in-person group, online, or combination) consisting of:

- an initial six-month phase offering at least 16 sessions over 16–24 weeks and a second six-month phase offering at least one session a month (at least six sessions)
- facilitation by a trained lifestyle coach
- use of a CDC-approved curriculum
- regular opportunities for direct interaction between the lifestyle coach and participants
- focus on behavior modification, managing stress, and peer support

The CDC Diabetes Prevention Recognition Program assures that organizations can deliver the lifestyle change program effectively and achieve the outcomes necessary to prevent or delay the onset of type 2 diabetes. To achieve CDC recognition, organizations must use a CDC-approved curriculum and meet national quality standards.

Patient-generated health data (PGHD). Information gathered by patients or health care professionals from diabetes technology or devices (e.g., diabetes software, diabetes glucose monitors, etc.).

Person-centered care practice. Efforts to recognize the people using health services as equal members of the care team in planning, executing, and monitoring their care and keeping their needs at the forefront.

Prediabetes. Blood glucose levels that are higher than normal but not high enough to be diagnosed as diabetes.

Service. A system or actions dedicated to supplying a demand.

Social determinants. The conditions in which someone lives, learns, works, and ages that affect their health.

track relevant evidence-based DSMES outcomes such as knowledge, behavior, clinical, quality of life, cost-savings, and satisfaction outcomes. The AADE Outcome Standards for Diabetes Education specify behavior change as the key outcome and the AADE7 Self-Care Behaviors (healthy eating, being active, taking medication, monitoring, problem solving, reducing risk, and healthy coping) provide a useful framework for assessment, documentation, and evaluation (111,122). Providers of DSMES should select validated measurement tools to accurately track outcomes.

Tracking and communication of individual outcomes must occur at appropriate intervals, e.g., before and after engaging in DSMES. The interval depends on the nature of the outcome itself (e.g., A1C every three to six months) and the timeframe specified based on the individual's personal goals. For some areas, the indicators, measures, and timeframes will be based on guidelines from professional organizations or government agencies (8).

STANDARD 10

Quality Improvement

The DSMES services quality coordinator will measure the impact and effectiveness of the DSMES services and identify areas for improvement by conducting a systematic evaluation of process and outcome data.

Formal quality improvement strategies can lead to improved diabetes outcomes (84,85). DSMES must be responsive to advances in knowledge, treatment strategies, education strategies, and psychosocial interventions, as well as consumer trends and the changing health care environment. By measuring and monitoring both process and outcome data on an ongoing basis, providers of DSMES can identify areas of improvement and adjust participant engagement strategies and service offerings accordingly. Evaluation can contribute to the sustainability of the service. Positive results from quality initiatives can be used in marketing efforts and shared with administration in larger health systems. A focus on quality is also part of overall medical quality initiatives including pay-for-performance and the Medicare Access and CHIP Reauthorization Act (MACRA), which has shifted provider payment based on productivity to one that focuses on quality and outcomes (172).

The Institute for Healthcare Improvement suggests three fundamental questions that should be answered by an improvement process: What are we trying to accomplish? How will we know a change is an improvement? And what changes can we make that will result in an improvement (173)?

Once areas for improvement are identified, the DSMES quality coordinator determines timelines and important milestones, including data collection, analysis, and presentation of results. Measuring a variety of outcomes ensures that change is successful without causing additional problems in the system. Outcome measures indicate the result of a process (i.e., whether changes are leading to improvement, e.g., a change in a behavior or a biomarker [A1C]), while process measures provide information about what caused those results (e.g., if the participant attended DSMES sessions or had an exam done) (173). Process measures are often targeted to those processes that affect the most important outcomes. Measures generally recommended for DSMES services include behavioral measures (e.g., participant's report of self-management activities and psychosocial behaviors including distress), clinical measures (e.g., changes in weight or A1C), operational measures (e.g., participant satisfaction, financial indicators, no-show rates, or results of marketing efforts), and process measures (e.g., participants receiving services, referral to DSMES, or referral for an eye exam). A variety of methods can be used for quality improvement initiatives, such as the Plan-Do-Study-Act model, Six Sigma, Lean, Re-AIM, and workflow mapping. There are resources available to assist those initiating quality improvement programs for the first time or for those looking for new options (84,85,172,174).

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