National Standards for Diabetes Self-Management Education

MARTHA M. FUNNELL, MS, RN, CDE
TAMMY L. BROWN, MPH, RD, BC-ADM, CDE
BELINDA P. CHILDS, ARNP, MN, CDE, BC-ADM
LINDA B. HAAS, PHC, CDE, RN
GWEN M. HOSEY, MS, ARNP, CDE
BRIAN JENSEN, RPH
MELINDA MARYNIUK, MED, RD, CDE
MARK PEYROT, PHD
JOHN D. PIETTE, PHD
DIANE READER, RD, CDE
LINDA M. SIMINERO, PHD, RN, CDE
KATIE WEINER, EDD, RN
MICHAEL A. WEISS, JD

Diabetes self-management education (DSME) is a critical element of care for all people with diabetes and is necessary in order to improve patient outcomes. The National Standards for DSME are designed to define quality diabetes self-management education and to assist diabetes educators in a variety of settings to provide evidence-based education. Because of the dynamic nature of health care and diabetes-related research, these Standards are reviewed and revised approximately every 5 years by key organizations and federal agencies within the diabetes education community.

A Task Force was jointly convened by the American Association of Diabetes Educators and the American Diabetes Association in the summer of 2006. Additional organizations that were represented included the American Dietetic Association, the Veteran’s Health Administration, the Centers for Disease Control and Prevention, the Indian Health Service, and the American Pharmaceutical Association. Members of the Task Force included a person with diabetes; several health services researchers/behaviorists, registered nurses, and registered dietitians; and a pharmacist.

The Task Force was charged with reviewing the current DSME standards for their appropriateness, relevance, and scientific basis. The Standards were then reviewed and revised based on the available evidence and expert consensus. The committee convened on 31 March 2006 and 9 September 2006, and the Standards were approved 25 March 2007.

DEFINITION AND OBJECTIVES — Diabetes self-management education (DSME) is the ongoing process of facilitating the knowledge, skill, and ability necessary for diabetes self-care. This process incorporates the needs, goals, and life experiences of the person with diabetes and is guided by evidence-based standards. The overall objectives of DSME are to support 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.

GUIDING PRINCIPLES — Before the review of the individual Standards, the Task Force identified overriding principles based on existing evidence that would be used to guide the review and revision of the DSME Standards. These are:

1. Diabetes education is effective for improving clinical outcomes and quality of life, at least in the short-term (1–7).
2. DSME has evolved from primarily didactic presentations to more theoretically based empowerment models (3,8).
3. There is no one “best” education program or approach; however, programs incorporating behavioral and psychosocial strategies demonstrate improved outcomes (9–11). Additional studies show that culturally and age-appropriate programs improve outcomes (12–16) and that group education is effective (4,6,7,17,18).
4. Ongoing support is critical to sustain progress made by participants during the DSME program (3,13,19,20).
5. Behavioral goal-setting is an effective strategy to support self-management behaviors (21).

STANDARDS

Structure

Standard 1. The DSME entity will have documentation of its organizational structure, mission statement, and goals and will recognize and support quality DSME as an integral component of diabetes care.

Documentation of the DSME organizational structure, mission statement, and goals can lead to efficient and effective provision of services. In the business literature, case studies and case report investigations on successful management strategies emphasize the importance of clear goals and objectives, defined relationships and roles, and managerial support (22–25). While this concept is relatively new in health care, business and health policy experts and organizations have begun to emphasize written commitments, policies, support, and the importance of outcome variables in quality improvement efforts (22,26–37). The continuous quality improvement literature also stresses the importance of developing policies, procedures, and guidelines (22,26).

Documentation of the organizational structure, mission statement, and goals can lead to efficient and effective provision of DSME. Documentation of an organizational structure that delineates
standards and Review Criteria

channels of communication and represents institutional commitment to the educational entity is critical for success (38–42). According to the Joint Commission on Accreditation of Health Care Organizations (JCAHO) (26), this type of documentation is equally important for small and large health care organizations. Health care and business experts overwhelmingly agree that documentation of the process of providing services is a critical factor in clear communication and provides a solid basis from which to deliver quality diabetes education (22,26,33,35–37). In 2005, JACHO published the Joint Commission International Standards for Disease or Condition-Specific Care, which outlines national standards and performance measurements for diabetes and addresses diabetes self-management education as one of seven critical elements (26).

Standard 2. The DSME entity shall appoint an advisory group to promote quality. This group shall include representatives from the health professions, people with diabetes, the community, and other stakeholders.

Established and new systems (e.g., committees, governing bodies, advisory groups) provide a forum and a mechanism for activities that serve to guide and sustain the DSME entity (30,39–41). Broad participation of organization(s) and community stakeholders, including health professionals, people with diabetes, consumers, and other community interest groups, at the earliest possible moment in the development, ongoing planning, and outcomes evaluation process (22,26,33,35,36,41) can increase knowledge and skills about the local community and enhance collaborations and joint decision-making. The result is a DSME program that is patient-centered, more responsive to consumer-identified needs and the needs to the community, more culturally relevant, and of greater personal interest to consumers (43–50).

Standard 3. The DSME entity will determine the educational needs of the target population(s) and identify resources necessary to meet those needs.

Clarifying the target population and determining its self-management educational needs serve to focus resources and maximize health benefits (51–53). The assessment process should identify the educational needs of all individuals with diabetes, not just those who frequently attend clinical appointments (51). DSME is a critical component of diabetes treatment (2,54,55), yet the majority of individuals with diabetes do not receive any formal diabetes education (56,57). Thus, identification of access issues is an essential part of the assessment process (58).

Demographic variables, such as ethnic background, age, formal educational level, reading ability, and barriers to participation in education, must also be considered to maximize the effectiveness of DSME for the target population (13–19,43–47,59–61).

Standard 4. A coordinator will be designated to oversee the planning, implementation, and evaluation of diabetes self-management education. The coordinator will have academic or experiential preparation in chronic disease care and education and in program management.

The role of the coordinator is essential to ensure that quality diabetes education is delivered through a coordinated and systematic process. As new and creative methods to deliver education are explored, the coordinator plays a pivotal role in ensuring accountability and continuity of the educational process (23,60–62). The individual serving as the coordinator will be most effective if there is familiarity with the lifelong process of managing a chronic disease (e.g., diabetes) and with program management.

Process

Standard 5. DSME will be provided by one or more instructors. The instructors will have recent educational and experiential preparation in education and diabetes management or will be a certified diabetes educator. The instructor(s) will obtain regular continuing education in the field of diabetes management and education. At least one of the instructors will be a registered nurse, dietitian, or pharmacist. A mechanism must be in place to ensure that the participant’s needs are met if those needs are outside the instructors’ scope of practice and expertise.

Diabetes education has traditionally been provided by nurses and dietitians. Nurses have been utilized most often as instructors in the delivery of formal DSME (2,3,5,63–67). With the emergence of medical nutrition therapy (66–70), registered dietitians became an integral part of the diabetes education team. In more recent years, the role of the diabetes educator has expanded to other disciplines, particularly pharmacists (73–79). Reviews comparing the effectiveness of different disciplines for education report mixed results (3,5,6). Generally, the literature favors current practice that utilizes the registered nurse, registered dietitian, and the registered pharmacist as the key primary instructors for diabetes education and members of the multidisciplinary team responsible for designing the curriculum and assisting in the delivery of DSME (1–7,77). In addition to registered nurses, registered dietitians, and pharmacists, a number of studies reflect the ever-changing and evolving health care environment and include other health professionals (e.g., a physician, behaviorist, exercise physiologist, ophthalmologist, optometrist, podiatrist) (48,80–84) and, more recently, lay health and community workers (85–91) and peers (92) to provide information, behavioral support, and links with the health care system as part of DSME.

Expert consensus supports the need for specialized diabetes and educational training beyond academic preparation for the primary instructors on the diabetes team (64,93–97). Certification as a diabetes educator by the National Certification Board for Diabetes Educators (NCBDE) is one way a health professional can demonstrate mastery of a specific body of knowledge, and this certification has become an accepted credential in the diabetes community (98). An additional credential that indicates specialized training beyond basic preparation is board certification in advance Diabetes Management (BCADM) offered by the American Nurses Credentialing Center (ANCC), which is available for master's prepared nurses, dietitians, and pharmacists (48,84,99).

DSME has been shown to be most effective when delivered by a multidisciplinary team with a comprehensive plan of care (7,31,52,100–102). Within the multidisciplinary team, team members work interdependently, consult with one another, and have shared objectives (7,103,104). The team should have a collective combination of expertise in the clinical care of diabetes, medical nutrition therapy, educational methodologies, teaching strategies, and the psychosocial and behavioral aspects of diabetes self-management. A referral mechanism should be in place to ensure that the individual with diabetes receives education from those with appropriate training and credentials. It is essential in this collaborative and integrated team approach that individuals with diabetes are viewed as leaders of their team and assume an active role in designing their educational experience (7,20,31,100–102,104).

Standard 6. A written curriculum reflecting current evidence and practice guidelines, with
Developing personal strategies to promote health and behavior change

People with diabetes and their families and caregivers have a great deal to learn in order to become effective self-managers of their diabetes. A core group of topics are commonly part of the curriculum taught in comprehensive programs that have demonstrated successful outcomes (1,2,3,6,105–109). The curriculum, a coordinated set of courses and educational experiences, includes learning outcomes and effective teaching strategies (110–112). The curriculum is dynamic and needs to reflect current evidence and practice guidelines (112–117). Current educational research reflects the importance of emphasizing practical, problem-solving skills, collaborative care, psychosocial issues, behavior change, and strategies to sustain self-management efforts (31,39,42,48,98,118–122).

The content areas delineated above provide instructors with an outline for developing this curriculum. It is important that the content be tailored to match each individual's needs and adapted as necessary for age, type of diabetes (including pre-diabetes and pregnancy), cultural influences, health literacy, and other co-morbidities (123,124). The content areas are designed to be applicable in all settings and represent topics that can be developed in basic, intermediate, and advanced levels. Approaches to education that are interactive and patient-centered have been shown to be effective (83,119,121,122,125–127).

These content areas are presented in behavioral terms and thereby exemplify the importance of action-oriented, behavioral goals and objectives (13,21,35,121–123,128,129). Creative, patient-centered experience-based delivery methods are effective for supporting informed decision-making and behavior change and go beyond the acquisition of knowledge.

**Standard 7.** An individual assessment and education plan will be developed collaboratively by the participant and instructor(s) to direct the selection of appropriate educational interventions and self-management support strategies. This assessment and education plan and the intervention and outcomes will be documented in the education record.

Multiple studies indicate the importance of individualizing education based on the assessment (1,56,68,131–135). The assessment includes information about the individual's relevant medical history, age, cultural influences, health beliefs and attitudes, diabetes knowledge, self-management skills and behaviors, readiness to learn, health literacy level, physical limitations, family support, and financial status (10–17,19,131,136–138). The majority of these studies support the importance of attitudes and health beliefs in diabetes care outcomes (1,68,134,135,138,139).

In addition, functional health literacy (FHL) level can affect patients' self-management, communication with clinicians, and diabetes outcomes (140,141). Simple tools exist for measuring FHL as part of an overall assessment process (142–144).

Many people with diabetes experience problems due to medication costs, and asking patients about their ability to afford treatment is important (144). Co-morbid chronic illness (e.g., depression and chronic pain) as well as more general psychosocial problems can pose significant barriers to diabetes self-management (104,146–151); considering these issues in the assessment may lead to more effective planning (149–151).

Periodic reassessment determines attainment of the educational objectives or the need for additional and creative interventions and future reassessment (7,97,100,152). A variety of assessment modalities, including telephone follow-up and other information technologies (e.g., Web-based, automated phone calls), may augment face-to-face assessments (97,99).

While there is little direct evidence on the impact of documentation on patient outcomes, it is required to receive payment for services. In addition, documentation of patient encounters guides the educational process, provides evidence of communication among instructional staff, may prevent duplication of services, and provides information on adherence to guidelines (37,64,100,131,153). Providing information to other members of the patient's health care team through documentation of educational objectives and personal behavioral goals increases the likelihood that all of the members will address these issues with the patient (37,98,153).

The use of evidence-based performance and outcome measures has been adopted by organizations and initiatives such as the Centers for Medicare and Medicaid Services (CMS), the National Committee for Quality Assurance (NCQA), the Diabetes Quality Improvement Project (DQIP), the Health Plan Employer Data and Information Set (HEDIS), the Veterans Administration Health System, and JCAHO (26,154).

Research suggests that the development of standardized procedures for documentation, training health professionals to document appropriately, and the use of structured standardized forms based on current practice guidelines can improve documentation and may ultimately improve quality of care (100,153–155).

**Standard 8.** A personalized follow-up plan for ongoing self-management support will be developed collaboratively by the participant and instructor(s). The patient's outcomes and goals and the plan for ongoing self-management support will be communicated to the referring provider.

While DSME is necessary, it is not sufficient for patients to sustain a lifetime of diabetes self-care (55). Initial improvements in metabolic and other outcomes diminish after ~6 months (3). To sustain behavior at the level of self-management needed to effectively manage diabetes, most patients need ongoing diabetes self-management support (DSMS).

DSMS is defined as activities to assist the individual with diabetes to implement and sustain the ongoing behaviors needed to manage their illness. The type of support provided can include behavioral, educational, psychosocial, or clinical (13,121–123).

A variety of strategies are available for
The AADE Outcome Standards for Diabetes Education specify self-management behavior as the key outcome (112,160). Knowledge is an outcome to the degree that it is actionable (i.e., knowledge that can be translated into self-management behavior). In turn, effective self-management is one (but not the only) contributor to longer-term, higher-order outcomes such as clinical status (e.g., control of glycemia, blood pressure, and cholesterol), health status (e.g., avoidance of complications), and subjective quality of life. Thus, patient self-management behaviors are at the core of the outcomes evaluation.

**Standard 10.** The DSME entity will measure the effectiveness of the education process and determine opportunities for improvement using a written continuous quality improvement plan that describes and documents a systematic review of the entities’ process and outcome data.

Diabetes education must be responsive to advances in knowledge, treatment strategies, educational strategies, psycho-social interventions, and the changing health care environment. Continuous quality improvement (CQI) is an iterative, planned process (161) that leads to improvement in the delivery of patient education (162). The CQI plan should define quality based on and consistent with the organization’s mission, vision, and strategic plan and include identifying and prioritizing improvement opportunities (163). Once improvement projects are identified and selected, the plan should incorporate timelines and important milestones including data collection, analysis, and presentation of results (163). Outcome measures indicate the result of a process (i.e., whether changes are actually leading to improvement), while process measures provide information about what caused those results (163–164). Process measures are often targeted to those processes that typically impact the most important outcomes. Measuring both process and outcomes helps to ensure that change is successful without causing additional problems in the system (164).

**Outcomes**

**Standard 9.** The DSME entity will measure attainment of patient-defined goals and patient outcomes at regular intervals using appropriate measurement techniques to evaluate the effectiveness of the educational intervention.

In addition to program-defined goals and objectives (e.g., learning goals, metabolic, and other health outcomes), the DSME entity needs to assess each patient’s personal self-management goals and his/her progress toward those personal goals. The AADE7 self-care behaviors provide a useful framework for assessment and documentation. Diabetes self-management behaviors include physical activity, healthy eating, medication taking, monitoring blood glucose, diabetes self-care related problem solving, reducing risks of acute and chronic complications, and psychosocial aspects of living with diabetes (112,160). Assessments of patient outcomes should occur at appropriate intervals. The interval depends on the outcome itself and the timeframe provided within the selected goals. For some areas, the indicators, measures, and timeframes may be based on guidelines from professional organizations or government agencies. In addition to assessing progress toward personal behavioral goals, a plan needs to be in place to communicate personal goals and progress to other team members.
interventions to improve patient compliance: a meta-analysis. Medical Care 36: 1138–1161, 1998
10. Barlow J, Wright C, Sheasby J, et al: Self-management approaches for people with chronic conditions: a review. Patient Education and Counseling 48: 177–187, 2002
11. Skinner TC, Craddock S, Arundel F, Graham W: Lifestyle and behaviour: four theories and a philosophy: self-management education for individuals newly diagnosed with type 2 diabetes. Diabetes Spectrum 16: 75–80, 2003
12. Brown SA, Hanis CL: Culturally competent diabetes education for Mexican Americans: the Starr County Study. Diabetes Educ 25:226–236, 1999
13. Anderson RM, Funnel MM, Nowankwo R, et al: Evaluating a problem based empowerment program for African Americans with diabetes: results of a randomized controlled trial. Ethnicity and Disease 15: 671–678, 2005
14. Sarkisian CA, Brown AF, Norris CK, Wintz RL, Mangione CM: A systematic review of diabetes self-care interventions for older, African American or Latino adults. Diabetes Educ 28:467–47915, 2003
15. Garvin DA: The processes of organization and management. Sloan Manage Rev (summer):30–50, 1998
16. Anderson-Loftin W, Barnett S, Bunn P, et al: Evaluating a problem based empowerment program for African Americans: the Starr County Study. Diabetes Spectrum 16: 75–80, 2003
17. Bodenheimer T, MacGregor K, Sharifi C: Helping Patients Manage Their Chronic Conditions. Oakland, CA, California Health Care Foundation, 2005
18. Deming WE: Out of the Crisis. Cambridge, MA, Massachusetts Institute of Technology, 2000
19. Brown SA, Blozis SA, Kouzekanani K, Garcia AA, Winchell M, Hanis CL: Dose effects of diabetes self-management education for Mexican Americans. Diabetes Care 28:527–532, 2005
20. Drucker PF: The objectives of a business (Chapter 7); Managing service institutions for performance in management tasks, responsibilities, practices (Chapter 14). In The Practice of Management. New York, Harper & Row, 1993
21. Drucker PF: Management: Tasks, Responsibilities, Practices. New York, Harper-business, 1993
22. Deming WE: Out of the Crisis. Cambridge, MA, Massachusetts Institute of Technology, 2000
23. Drucker PF: The objectives of a business (Chapter 7); Managing service institutions for performance in management tasks, responsibilities, practices (Chapter 14). In The Practice of Management. New York, Harper & Row, 1993
24. Drucker PF: Management: Tasks, Responsibilities, Practices. New York, Harper-business, 1993
25. Garvin DA: The processes of organization and management. Sloan Manage Rev (summer):30–50, 1998
26. Joint Commission on Accreditation of Healthcare Organizations. Joint Commission International Standards for Disease or Condition-Specific Care. 1st ed. Oakbrook Terrace, IL, Joint Accreditation on Healthcare Organizations, 2005
27. Berwick DM: A primer on leading the improvement of systems. BMJ 312:619–622, 1996
28. Clemen TR, Spuhler VJ, Berwick DM, Nolan TW: Cooperation: the foundation of improvement. Annals Internal Medicine 128:1004–1009, 1998
29. Courtney L, Gordon M, Roter L: A clinical path for adult diabetes. The Diabetes Educator 23:664–671, 1997
30. Glassow RE, Hiss RG, Anderson RM, Friedman NM, Hayward RA, Marrero DG, Taylor CB, Vinicom F: Report of the Health Care Delivery Work Group. Diabetes Care 24:124–130, 2001
31. Wagner EH, Austin BT, Von Korff M: Organizing care for patients with chronic illness. Millbank Quarterly 74: 511–544, 1996
32. Community Health Improvement Partners: From the board room to the community room: a health improvement collaboration that’s working. Journal of Quality Improvement 24:549–564, 1998
33. Kiefe CI, Allison JJ, Willais OD, Person SD, Weaver MT, Weissman NW: Improving quality improvement using achievable benchmarks for physician feedback. JAMA 285:2871–2879, 2001
34. Solberg LI, Reger LA, Pearson TL, O’Connor PJ, Freeman SL, Lasch SL, Bishop DB: Using continuous feedback. JAMA 285:2871–2879, 2001
35. Simmons D, Voyle J, Swinburn B, O’Dea K: Community-based approaches for the primary prevention of non-insulin-dependent diabetes mellitus. Diabet Med 14:510–526, 1997
36. Solberg LI, Reger LA, Pearson TL, O’Connor PJ, Freeman SL, Lasch SL, Bishop DB: Using continuous feedback. JAMA 285:2871–2879, 2001
37. Von Korff M, Gruman J, Schaefer J, Curry SJ, Wagner EH: Collaborative management of chronic illness. Ann Intern Med 127:1097–1102, 1997
38. Fox CH, Mahoney MC: Improving diabetes preventative care in a family practice residency program: a case study in continuous quality improvement. Family Medicine 30:441–445, 1998
39. Siminerio L, Piatt G, Emerson S, Ruppert K, Saul M, Solanco F, Stewart A, Zgibor J: Deploying the chronic care model to implement and sustain diabetes self-management training programs. Diabetes Educ 32:1–8, 2006
40. Siminerio LM, Zgibor JC, Solano FX: Implementing the chronic care model for improvements in diabetes practice and outcomes in primary care. The University of Pittsburgh Medical Center Experience. Clinical Diabetes 22:54–58, 2003
41. Heins JM, Nord Wr, Cameron M: Establishing and sustaining state-of-the-art diabetes education programs: research and recommendations. Diabetes Educ 18:501–508, 1992
42. Mangan M: Diabetes self-management education programs in the Veterans Health Administration. Diabetes Educ 23:687–698, 1997
43. Griffin JA, Gilliland SS, Perez G, Heltzer D, Carter JS.: Participants satisfaction with culturally appropriate diabetes education program: the Native American diabetes education program in a north-west Indian tribe. Diabetes Educ 25:351–365, 1999
44. Hiss RG: Barriers to care in non-insulin-dependent diabetes mellitus: the Michigan experience. Ann Intern Med 124: 146–148, 1996
45. Simmons D, Doyle J, Swinburn B, O’Dea K: Community-based approaches for the primary prevention of non-insulin-dependent diabetes mellitus. Diabet Med 14:510–526, 1997
46. Gamm LD: Advancing community health through community health partnerships. J Healthcare Management 43: 51–67, 1998
47. Snoek FJ: Quality of life: a closer look at measuring patients’ well-being. Diabetes Spectrum 13:24–28, 2000
48. Piatt G, Brooks MM, Orchard TJ, Kortykowski M, Emerson S, Siminerio L, Simmons D, Ahmad U, Soner TJ, Zgibor J: Translating the chronic care model into the community. Diabetes Care 29: 811–816, 2006
49. Harris SB, Zinman B: Primary prevention of type 2 diabetes in high-risk populations. Diabetes Care 23:87–881, 2000
50. Rothman J: Approaches to community intervention. In Strategies of Community Intervention. 5th ed. Itasca, IL, F. Peacock, 2001, p. 26–63
51. O’Connor PJ, Pronk NP: Integrating population health concepts, clinical guidelines, and ambulatory medical care systems to improve diabetes care. J Am- care.diabetesjournals.org

Diabetes Care, volume 34, Supplement 1, January 2011

593

Standards and Review Criteria
92. Heisler M: Building peer support programs to manage chronic disease: seven models for success. Oakland, CA, California Health Care Foundation, 2006
93. Anderson RM, Donnelly MB, Gressard CP: The attitudes of nurses, dietitians, and physicians toward diabetes. *Diabetes Educ* 17:261–268, 1991
94. Lorenz RA, Bubh J, Davis D, Jacobson A, Janmash K, Kramer J, Lipps J, Schlundt D: Changing behavior: practical lessons from the Diabetes Control and Complications Trial. *Diabetes Care* 19:648–652, 1996
95. Ockene JK, Ockene IS, Quirk ME, Herbert JR, Sapera GM, Luippold RS, Merriman PA, Ellis S: Physician training for patient-centered nutrition counseling in a lipid intervention trial. *Prev Med* 24:563–570, 1995
96. Cymbus M, Wylie-Rosett J, Engel SS, Leggett-Frazier N, Swanson MS, Vincent CP: The scope of practice of diabetes educators. *Diabetes Educ* 23:287–293, 1997
97. Leggett-Frazier N, Swanson MS, Vincent PA, Pokorny ME, Engelke MK: Telephone communication between diabetes clients and nurse educators. *Diabetes Educ* 23:287–293, 1997
98. American Association of Diabetes Educators: The scope of practice for diabetes educators and the standards of practice for diabetes educators. *Diabetes Educ* 26:185–193, 2000
99. Valentine V, Kulkarni K, Hinnen D: Evolving roles: from diabetes educators to advanced diabetes managers. *Diabetes Spectrum* 16:27–31, 2004
100. Glasgow RE, Funnell MM, Bonomi AE, Davis CL, Beckham V, Wagner EH: Self-management aspects of the Improving Chronic Illness Care Breakthrough series: design and implementation with diabetes and heart failure teams. *Ann Behav Med* 24:80–87, 2002
101. Olman JJ, Badamgarav E, Henning JM, Knight K, Gano AD Jr, Levan RK, Gur-Arie S, Richards MS, Hassellblad V, Weingarten SR: Does disease management improve clinical and economic outcomes in patients with chronic diseases? A systematic review. *Am J Med* 117:182–192, 2004
102. Wensing M, Wollersheim H, Grol R: Organizational interventions to implement improvements in patient care: a structured review of reviews. *Implementation Sci* 1:2, 2006
103. Mazze R, Albin J, Friedman J, Hahn S, Murphy JA, Reese P, Rosen S, Scaggs C, Shamoone H, Vaccaro-Olko MJ: Diabetes education teams. *Professional Education in Diabetes: Proceedings of the DRTC Conference*. National Diabetes Information Clearinghouse and National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health, December 1980
104. Skovlund SE, Peyrot M, on behalf of the DAWN International Advisory Panel: The Diabetes Attitudes, Wishes, and Needs (DAWN) program: a new approach to improving outcomes of diabetes care. *Diabetes Spectrum* 18:136–142, 2005
105. Norris SL, Nichols PJ, Caspersen CJ, Glasgow RE, Emmelgau MM, Jack J, Snyder SR, Carande-Kulis VG, Isham G, Garfield S, Brus P, McCulloch D, and the Task Force on Community Preventive Services: Increasing diabetes self-management education in community settings: a systematic review. *Am J Prev Med* 22:33–66, 2002
106. Norris SL, Zhang X, Avenell A, Gregg E, Bowman B, Serdula M, Brown TJ, Schmid CH, Lau J: Long term effectiveness of lifestyle and behavioral weight loss interventions in adults with type 2 diabetes: a meta-analysis. *Am J Med* 117:742–762, 2004
107. Ellis SE, Speroff T, Dittus RS, Brown A, Stager TB: The scope of practice of diabetes educators. *Patient Educ Counsel* 52:97–105, 2004
108. Brown SA: Studies of educational interventions in diabetes care: a meta-analysis revisited. *Patient Educ Counsel* 16:189–213, 1990
109. Armour TA, Norris SL, Jack L Jr, Zhang X, Fisher E: The effectiveness of family interventions in people with diabetes mellitus: a systematic review. *Diabet Med* 10:1295–1305, 2003
110. Redman BK: The Practice of Patient Education, 10th ed. St. Louis, MO, Mosby, 2007
111. Wikipedia: Curriculum definition. Available at http://en.wikipedia.org/wiki/Curriculum. Accessed 7 January 2007
112. Mulcahy K, Maryniuk M, Peeples M, Peyrot M, Tomley D, Weaver T, YARBOROUGH P: Diabetes self-management education core outcome measures. *Diabetes Educ* 29:768–803, 2003
113. American Association of Diabetes Educators: The scope of practice, standards of practice, and standards of professional performance for diabetes educators. *Diabetes Educ* 31:487–512, 2005
114. American Diabetes Association: Standards of medical care in diabetes—2009. *Diabetes Care* 32 (Suppl. 1):S13–S61, 2009
115. American Diabetes Association: Nutrition recommendations and interventions for diabetes: a position statement of the American Diabetes Association (Position Statement). *Diabetes Care* 30 (Suppl. 1):S48–S65, 2007
116. Reader D, Splett P, Gunderson EP: Impact of gestational diabetes mellitus nutrition practice guidelines implemented by registered dietitians on pregnancy outcomes. *J Am Dietetic Association* 9:1426–1433, 2006
117. Kulkarni K, Boucher JL, Daly A, Shwided-Slavin C, Silver BT, O-Sullivan-Maillet J, Pritchett E, American Diabetes Association, Diabetes Care and Education Practice Group, American Diabetes Association: Standards of practice and standards of professional performance for registered dietitians (generalist, specialist, and advanced) in diabetes care. *J Am Dietetic Association* 105:819–824, 2005
118. Blanchard MA, Rose LE, Taylor J, McEntire MA, Latchaw L: Using a focus group to design a diabetes program for an African American population. *Diabetes Educ* 25:917–923, 1999
119. Sarkadi A, Rosenqvist U: Study circles at the pharmacy—a new model for diabetes education in groups. *Patient Educ Counselling* 37:89–96, 1999
120. Norris SL: Health related quality of life among adults with diabetes. *Curr Diab Reports* 5:124–30, 2005
121. Tang TS, Gillard ML, Funnell MM, et al: Developing a new generation of ongoing diabetes self-management support interventions (DSMS): a preliminary report. Diabetes Educ 31:91–97, 2005
122. Funnell MM, Nwankwo R, Gillard ML, Anderson RM, Tang TS: Implementing an empowerment-based diabetes self-management education program. *Diabetes Educ* 31:53–61, 2005
123. Glazier RH, Bajcar J, Kennie NR, Willson K: A systematic review of interventions to improve diabetes care in socially disadvantaged populations. *Diabetes Care* 26:1675–88, 2006
124. Samuel-Hodge DC, Keyserling TC, France R, Ingram AF, Johnston LF, Pullen Davis L, Davis G, Cole AS: A church based diabetes self-management education program for African Americans with type 2 diabetes. *Prev Chronic Dis* 3:A93, 2006
125. Trento M, Passera P, Borgo E, Tomalino M, Bajardi M, Cavallo F, Porta M: A 5-year randomized controlled study of learning, problem solving ability, and quality of life modifications in people with type 2 diabetes managed by group education. *Diabetes Care* 27:670–675, 2004
126. Izquierdo RE, Knudson PE, Meyer S, Kearns J, Ploutz-Snyder R, Weinstock R: A comparison of diabetes education administered through telemedicine versus in person. *Diabetes Care* 26:1002–1007, 2003
127. Garrett N, Hageman CM, Sibley SD, Davern M, Berger M, Brunzell C, Malucha K, Richards SW: The effectiveness of an interactive small group diabetes intervention in improving knowledge, feeling of control and behavior. *Health Promot Pract* 6:320–328, 2005
128. Hayes JT, Boucher JL, Pronk NP, Gehlin
Standards and Review Criteria

E. Spence M, Waslaski J: The role of the certified diabetes educator in telephone counseling. Diabetes Educ 27:377–386, 2001

129. Carlson A, Rosenqvist U: Diabetes care organization, process and patient outcomes: effects of a diabetes control program. Diabetes Educ 17:42–48, 1991

130. Handley M, MacGregor K, Schilling D, Scharf C, Wong S, Bodenheimer T: Using action plans to help primary care patients adopt healthy behaviors: A descriptive study. J Am Board Fam Med 19:224–231, 2006

131. Gilden JL, Hendryx M, Casia C, Singh SP: The effectiveness of diabetes education programs for older patients and their spouses. J Am Geriatr Soc 37:1023–1030, 1989

132. Brown SA: Effects of educational interventions in diabetes care: a meta-analysis of findings. Nurs Res 37:223–230, 1988

133. Davis WK, Hull AL, Boutaugh ML: Factors affecting the educational diagnosis of diabetic patients. Diabetes Care 4:275–278, 1981

134. Anderson RM, Fitzgerald JT, Oh M: The relationship between diabetes-related attitudes and patients’ self-reported adherence. Diabetes Educ 19:287–292, 1993

135. Funnell MM, Anderson RM: AADE Position Statement: individualization of diabetes self-management education. Diabetes Educ 33:45–49, 2007

136. Ad Hoc Committee on Health Literacy: The added value of therapy in diabetes: the added value of therapy in diabetes: the value of therapy in diabetes: the added value of therapy in diabetes. Diabetes Care 29:563–574, 2006

137. Davis TC, Crouch MA, Wills G, Miller S, Abdehou DM: The gap between patient needs and patient education materials. J Fam Pract 31:533–538, 1990

138. Thomson FJ, Masson EA: Can elderly patients co-operate with routine foot care? Diabetes Spectrum 8:218–219, 1995

139. Assal JP, Jacquemet S, Morel Y: The added value of therapy in diabetes: the education of patients for self-management of their disease. Metabolism 46:61–64, 1997

140. Ad Hoc Committee on Health Literacy for the Council on Scientific Affairs, American Medical Association: Health literacy: report of the Council on Scientific Affairs. JAMA 281:552–557, 1999

141. Schillinger D, Grumbach K, Pettee J, Wang F, Osmond D, Daher C, Palacios J, Diaz Sullivan G, Bindman AB: Association of health literacy with diabetes outcomes. JAMA 288:475–482, 2002

142. Nurss JR, Parker R, Williams M, Baker D: STOFHHA Teaching Edition. Snow Camp, NC, Peppercorn Books, 2003

143. Chew LD, Bradley KA, Boyko EJ: Brief questions to identify patients with inadequate health literacy. Family Medicine 36:588–594, 2006

144. Schillinger D, Pettee J, Grumbach K, Wang F, Wilson C, Daher C, et al: Closing the loop: physician communication with diabetic patients who have low health literacy. Arch Intern Med 163:83–90, 2003

145. Pettee JD, Heisler M, Wagner TH: Problems paying out of pocket medication costs among older adults with diabetes. Diabetes Care 27:384–391, 2004

146. Peyrot M, Rubin RR, Lauritzen T, Snoek FJ, Matthews DR, Skovlund SE: Psychosocial problems and barriers to improved diabetes management: results of the cross-national Diabetes Attitudes, Wishes, and Needs study. Diabetes Care 27:1379–1385, 2004

147. Peyrot M, Rubin RR, Siminerio L, on behalf of the International DAWN Advisory Panel: Physician and nurse use of psychosocial strategies in diabetes care: results of the cross-national Diabetes Attitudes, Wishes, and Needs study. Diabetes Care 29:1256–1262, 2006

148. Rubin RR, Peyrot M, Siminerio L, on behalf of the International DAWN Advisory Panel: Health care and patient-reported outcomes: results of the cross-national Diabetes Attitudes, Wishes, and Needs study. Diabetes Care 29:1249–1255, 2006

149. McKellar JD, Humphreys K, Pettee JD: Depression increases diabetes symptoms by complicating patients’ self-care adherence. Diabetes Educ 30:485–492, 2004

150. Kren SL, Heitsler M, Pettee JD, Makkir E, Kerr EA: The effect of chronic pain on diabetes patients’ self-management. Diabetes Care 28:65–70, 2005

151. Pettee JD, Kerr E: The role of comorbid chronic conditions on diabetes care. Diabetes Care 29:239–253, 2006

152. Estey AL, Tan MH, Mann K: Follow-up intervention: its effect on compliance behavior to a diabetes regimen. Diabetes Educ 16:291–295, 1990

153. Glasgow RE, Davis CL, Funnell MM, et al: Implementing practical interventions to support chronic illness self-management. Joint Commission Journal on Quality and Safety 29:563–574, 2003

154. Daly A, Leontos C: Legislation for health care coverage for diabetes self-management training, equipment and supplies: past, present and future. Diabetes Spectrum 12:222–230, 1999

155. Grebe SKG, Smith RBW Clinical audit and standardized follow-up improve quality of documentation in diabetes care. N Z Med J 108:339–342, 1995

156. Schriger DL, Baraf L, Rogers WH, Cretin S: Implementation of clinical guidelines using a computer charting system: effect on the initial care of health care workers exposed to body fluids. JAMA 278:1585–1590, 1997

157. Aubert RE, Herman WH, Waters J, Moore W, Sutton D, Peterson BL, Bailey CM, Koplan JP: Nurse case management to improve glycemic control in diabetic patients in a health maintenance organization: a randomized, controlled trial. Ann Intern Med 129:605–612, 1998

158. Knight K, Badamgarav E, Henning JM, Hasselblad V, Gano AD Jr, Olman JJ, Weingarten SR: A systematic review of diabetes disease management programs. Am J Managed Care 11:242–50, 2005

159. Two Peathers J, Kieffer EC, Palmasano G, et al: Racial and ethnic approaches to community health (REACH) Detroit partnership: improving diabetes-related outcomes among African American and Latino adults. Am J Public Health 95:1552–1560, 2005

160. Mulcahy K, Marynuk M, Pellep M, Peyrot M, Tomsky D, Weaver T, Yarborough P: AADE Position Statement: standards for outcomes measurement of diabetes self-management education. Diabetes Educ 29:804–816, 2003

161. Institute of Healthcare Improvement: How to improve: improvement methods. Available at http://www.ihi.org/IHI/Topics/Improvement/improvementmethods/ Accessed 24 April 2006

162. Bardsley J, Bronzini B, Harriman K, Lumber T: CQI: A Step by Step Guide for Quality Improvement in Diabetes Education. Chicago, IL, American Association of Diabetes Educators, 2005

163. Joint Commission Resources: Cost-Effective Performance Improvement in Ambulatory Care. Oakbrook Terrace, IL, Joint Commission on Accreditation of Healthcare Organizations, 2003

164. Institute of Healthcare Improvement: Measures: diabetes. Available at http://www.ihi.org/IHI/Topics/ChronicConditions/Diabetes/Measures. Accessed 24 April 2006