

# National Standards for Diabetes Self-Management Education

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**D**iabetes 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

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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 diabetes educational needs of the target population(s) and identify resources necessary to meet these 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 indi-

viduals 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 die-

titian, 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 advanced Diabetes Management (BC-ADM) 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*

criteria for evaluating outcomes, will serve as the framework for the DSME entity. Assessed needs of the individual with pre-diabetes and diabetes will determine which of the content areas listed below are to be provided:

- Describing the diabetes disease process and treatment options
- Incorporating nutritional management into lifestyle
- Incorporating physical activity into lifestyle
- Using medication(s) safely and for maximum therapeutic effectiveness
- Monitoring blood glucose and other parameters and interpreting and using the results for self-management decision making
- Preventing, detecting, and treating acute complications
- Preventing detecting, and treating chronic complications
- Developing personal strategies to address psychosocial issues and concerns
- 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 comorbidities (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 (13,21,55,121–123,128,129). 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). Comorbid 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

providing DSMS both within and outside the DSME entity. Some patients benefit from working with a nurse case manager (7,20,98,157). Case management for DSMS can include reminders about needed follow-up care and tests, medication management, education, behavioral goal-setting, and psychosocial support/connection to community resources.

The effectiveness of providing DSMS through disease-management programs, trained peers and health community workers, community-based programs, use of technology, ongoing education and support groups, and medical nutrition therapy has also been established (7,13,89–92,101,121–123,158–159).

While the primary responsibility for diabetes education belongs to the DSME entity, patients benefit by receiving reinforcement of content and behavioral goals from their entire health care team (100). Additionally, many patients receive DSMS through their provider. Thus, communication is essential to ensure that patients receive the support they need.

### 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.

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, psychosocial 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).

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### References

1. Brown SA: Interventions to promote diabetes self-management: state of the science. *Diabetes Educ* 25 (6 Suppl.):52–61, 1999
2. Norris SL, Engelgau MM, Narayanan KMV: Effectiveness of self-management training in type 2 diabetes: a systematic review of randomized controlled trials. *Diabetes Care* 24:561–587, 2001
3. Norris SL, Lau J, Smith SJ, Schmid CH, Engelgau MM: Self-management education for adults with type 2 diabetes: a meta-analysis on the effect on glycemic control. *Diabetes Care* 25:1159–1171, 2002
4. Norris SL: Self-management education in type 2 diabetes. *Practical Diabetology* 22:713, 2003
5. Gary TL, Genkinger JM, Guallar E, Peyrot M, Brancati FL: Meta-analysis of randomized educational and behavioral interventions in type 2 diabetes. *Diabetes Educ* 29:488–501, 2003
6. Deakin T, McShane CE, Cade JE, et al. Review: group based education in self-management strategies improves outcomes in type 2 diabetes mellitus. *Cochrane Database Syst Rev* (2): CD003417, 2005
7. Renders CM, Valk GD, Griffin SJ, Wagner EH, Eijk van JThM, Assendelft WJJ: Interventions to improve the management of diabetes in primary care, outpatient, and community settings: a systematic review. *Diabetes Care* 24: 1821–1833, 2001
8. Funnell MM, Anderson RM: Patient empowerment: a look back, a look ahead. *Diabetes Educ* 29:454–464, 2003
9. Roter DL, Hall JA, Merisca R, Nordstrom B, Cretin D, Svarstad B: Effectiveness of

- 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 behavior: 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, Funnell 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* 28:467–479, 2003
  15. Chodosh J, Morton SC, Mojica W, Maglione M, Suttrop MJ, Hilton L, Rhodes S, Shekelle P: Meta-analysis: chronic disease self-management programs for older adults. *Ann Intern Med* 143:427–438, 2005
  16. Anderson-Loftin W, Barnett S, Bunn P, et al: A. Soul food light: culturally competent diabetes education. *Diabetes Educ* 31:555–563, 2005
  17. Mensing CR, Norris SL: Group education in diabetes: effectiveness and implementation. *Diabetes Spectrum* 16:96–103, 2003
  18. Rickheim PL, Weaver TK, Flader JL, Kendall DM: Assessment of group versus individual education: a randomized study. *Diabetes Care* 25:269–274, 2002
  19. Brown SA, Blozis SA, Kouzekanani K, Garcia AA, Winchell M, Hanis CL: Dosage effects of diabetes self-management education for Mexican Americans. *Diabetes Care* 28:527–532, 2005
  20. Polonsky WH, Earles J, Smith S, Pease DJ, Macmillan M, Christensen R, Taylor T, Dickert J, Jackson RA: Integrating medical management with diabetes self-management training: a randomized control trial of the Diabetes Outpatient Intensive Treatment Program. *Diabetes Care* 26:3094–3053, 2003
  21. Bodenheimer T, MacGregor K, Sharifi C: *Helping Patients Manage Their Chronic Conditions*. Oakland, CA, California Healthcare Foundation, 2005
  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. Clemmer TP, Spuhler VJ, Berwick DM, Nolan TW: Cooperation: the foundation of improvement. *Annals Internal Medicine* 128:1004–1009, 1998
  29. Courtney L, Gordon M, Romer L: A clinical path for adult diabetes. *The Diabetes Educator* 23:664–671, 1997
  30. Glasgow RE, Hiss RG, Anderson RM, Friedman NM, Hayward RA, Marrero DG, Taylor CB, Vinicor 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, Cherney LM, O'Connor PJ, Freeman SL, Lasch SL, Bishop DB: Using continuous quality improvement to improve diabetes care in populations: the IDEAL model. *J Qual Improv* 23:531–591, 1997
  35. O'Connor PJ, Rush WA, Peterson J, Morben P, Cherney L, Keogh C, Lasch S: Continuous quality improvement can improve glycemic control for HMO patients with diabetes. *Archives Family Medicine* 5:502–506, 1996
  36. Wagner EH, Davis C, Schaefer J, Von Korff M, Austin B: A survey of leading chronic disease management programs: are they consistent with the literature? *Journal of Nursing Care Quality* 16:67–80, 2002
  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, Solano 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* 18:501–598, 1992
  42. Mangan M: Diabetes self-management education programs in the Veterans Health Administration. *Diabetes Educ* 23:687–695, 1997
  43. Griffin JA, Gilliland Ss, Perez G, Helitzer 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* 25:351–363, 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, Voyle J, Swinburn B, O'Dea K: Community-based approaches for the primary prevention of non-insulin-dependent diabetes mellitus. *Diabet Med* 14:519–526, 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 JC: 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* 23:87–88, 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*

- bulatory Care Manager 21:67–73, 1998
52. Wagner EH: The role of patient care teams in chronic disease management. *Br Med J* 320:569–572, 2000
  53. Hiss RG, Gillard ML, Armbruster BA, McClure LA: Comprehensive evaluation of community-based diabetic patients. *Diabetes Care* 24:690–694, 2001
  54. Jack L: Diabetes Self-Management Education Research: An international review of intervention methods, theories, community partners and outcomes. *Disease Management and Health Outcomes* 11:415–428, 2003
  55. Piette JD, Glasgow R: Strategies for improving behavioral health outcomes among patients with diabetes: self-management, education. In *Evidence-Based Diabetes Care*. Gerstein HC, Haynes RB, Eds. Ontario, Canada, BC Decker Publishers 2001, p. 207–251
  56. Coonrod BA, Betschart J, Harris MI: Frequency and determinants of diabetes patient education among adults in the U.S. population. *Diabetes Care* 17:852–858, 1994
  57. Pearson J, Mensing C, Anderson R: Medicare reimbursement and diabetes self-management training: national survey results. *Diabetes Educ* 30:914–927, 2004
  58. Siminerio L, Piatt G, Zgibor J: Implementing the chronic care model in a rural practice. *Diabetes Educ* 31:225–234, 2005
  59. Anderson RM, Goddard CE, Garcia R, Guzman JR, Vazquez F: Using focus groups to identify diabetes care and education issues for Latinos with diabetes. *Diabetes Educ* 24:618–625, 1998
  60. Zgibor JC, Simmons D: Barriers to blood glucose monitoring in a multiethnic community. *Diabetes Care* 25:1772–1777, 2002
  61. Johnson K, Schubring L: The evolution of a hospital-based decentralized case management model. *Nursing Economics* 17:29–48, 1999
  62. Diabetes Control and Complications Trial Research Group: The impact of the trial coordinator in the Diabetes Control and Complications Trial (DCCT). *Diabetes Educ* 19:509–512, 1993
  63. Koproski J, Pretto Z, Poretzky L: Effects of an intervention by a diabetes team in hospitalized patients with diabetes. *Diabetes Care* 20:1553–1555, 1997
  64. Davis ED: Role of the diabetes nurse educator in improving patient education. *Diabetes Educ* 16:36–43, 1990
  65. Feddersen E, Lockwood DH: An inpatient diabetes educator's impact on length of hospital stay. *Diabetes Educ* 20:125–128, 1994
  66. Weinberger M, Kirkman MS, Samsa GP, Shortliffe EA, Landsman PB, Cowper PA, Simel DL, Feussner JR: A nurse-coordinated intervention for primary care patients with non-insulin dependent diabetes mellitus: impact on glycemic control and health-related quality of life. *J Gen Intern Med* 10:59–66, 1995
  67. Spellbring AM: Nursing's role in health promotion. *Nurs Clin North Am* 26:805–814, 1991
  68. Glasgow RE, Toobert DJ, Hampson SE, Brown JE, Lewinsohn PM, Donnelly J: Improving self-care among older patients with type II diabetes: the "sixty-something" study. *Patient Educ Couns* 19:61–74, 1992
  69. Diabetes Control and Complications Trial Research Group: Expanded role of the dietitian in the Diabetes Control and Complications Trial: implications for practice. *J Am Diet Assoc* 93:758–767, 1993
  70. Delahanty LM, Halford BH: The role of diet behaviors in achieving improved glycemic control in intensively treated patients in the Diabetes Control and Complications Trial. *Diabetes Care* 16:1453–1458, 1993
  71. Franz MJ, Monk A, Barry B, McLain K, Weaver T, Cooper N, Upham P, Bergental R, Mazze R: Effectiveness of medical nutrition therapy provided by dietitians in the management of non-insulin-dependent diabetes mellitus: a randomized, controlled clinical trial. *J Am Diet Assoc* 95:1009–1017, 1995
  72. Khakpour D, Thompson L: The nutrition specialist on the diabetes management team. *Clin Diabetes* 16:21–22, 1998
  73. Baran R, Crumlish K, Patterson H, Shaw J, Erwin G, Wylie J, Duong P: Improving outcomes of community-dwelling older patients with diabetes through pharmacist counseling. *Am J Health Syst Pharm* 56:1535–1539, 1999
  74. Coast-Senior EA, Kroner BA, Kelley CL, Trilli LE: Management of patients with type 2 diabetes by pharmacists in primary care clinics. *Ann Pharmacother* 32:636–641, 1998
  75. Huff PS, Ives TJ, Almond SN, Griffin NW: Pharmacist-managed diabetes education service. *Am J Hosp Pharm* 40:991–993, 1983
  76. Canter CL: The Asheville Project: Long term-clinical and economic outcomes of a community pharmacy diabetes care program. *J Am Pharm Assoc (Wash)* 43:173–184, 2003
  77. Van Veldhuizen-Scott MK, Widmer LB, Stacey SA, Popovich NG: Developing and implementing a pharmaceutical care model in an ambulatory care setting for patients with diabetes. *Diabetes Educ* 21:117–123, 1995
  78. Garrent DG, Blumi BM: Patient self-management program for diabetes: first-year clinical, humanistic, and economic outcomes. *J Am Pharm Assoc* 45:130–137, 2005
  79. Shane-McWhorter L, Fermo JD, Bultmeier NC, Oderda GM: National survey of pharmacist certified diabetes educators. *Pharmacotherapy* 22:1579–1593, 2002
  80. Franz MJ, Callahan T, Castle G: Changing roles: educators and clinicians. *Clin Diabetes* 12:53–54, 1994
  81. Rubin RR, Peyrot M, Saudek CD: Effect of diabetes education on self-care, metabolic control, and emotional well-being. *Diabetes Care* 12:673–679, 1989
  82. Campbell EM, Redman S, Moffitt PS, Sanson-Fisher RW: The relative effectiveness of educational and behavioral instruction programs for patients with NIDDM: a randomized trial. *Diabetes Educ* 22:379–386, 1996
  83. Rubin RR, Peyrot M, Saudek CD: The effect of a diabetes education program incorporating coping skills, training on emotional well-being, and diabetes self-efficacy. *Diabetes Educ* 19:210–214, 1993
  84. Emerson S: Implementing diabetes self-management education in primary care. *Diabetes Spectrum* 19:79–83, 2006
  85. Satterfield D, Burd, C Valdez L, Hosey G, Eagle Shield J: The "In-Between People": participation of community health representatives and lay health workers in diabetes prevention and care in American Indian and Alaska Native communities. *Health Promotion Practice* 3:66–175, 2002
  86. American Association of Diabetes Educators: American Association of Diabetes Educators Position Statement: diabetes community health workers. *Diabetes Educ* 29:818–823, 2003
  87. American Public Health Association (APHA) Policy Statement No. 2001–15. Recognition and support for community health workers' contributions to meeting our nation's health care needs. Policy Statements Adopted by the Governing Council of the American Public Health Association, October 24, 2001. *Am J Public Health* 92:451–483, 2002
  88. Norris SL, Chowdhury FE, VanLet K, Horsley T, Brownstein JN, Zhang X, Jack L Jr, Satterfield DW: Effectiveness of community health workers in the care of persons with diabetes. *Diabet Med* 23:544–556, 2006
  89. Lewin SA, Dick J, Pond P, Zwarenstein M, Aja G, van Wyk B, Bosch-Copblanch Z, Patrick M: Lay health workers in primary and community health care. *Cochrane Database Syst Rev* 1:2005
  90. Norris SL, Nichols PJ, Caspersen CJ, et al: Increasing diabetes self-management education in community settings. a systematic review. *Am J Prev Med* 22:39–43, 2002
  91. Lorig KR, Ritter P, Stewart AL, et al: Chronic disease self-management programs. *Medical Care* 39:1217–1221, 2001

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, Bubb J, Davis D, Jacobson A, Jannasch 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, Saperia GM, Luippold RS, Merriam PA, Ellis S: Physician training for patient-centered nutrition counseling in a lipid intervention trial. *Prev Med* 24:563–570, 1995
96. Cypress M, Wylie-Rosett J, Engel SS, Stager TB: The scope of practice of diabetes educators in a metropolitan area. *Diabetes Educ* 18:111–114, 1992
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* 26:25–31, 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. Ofman JJ, Badamgarav E, Henning JM, Knight K, Gano AD Jr, Levan RK, Guraire S, Richards MS, Hasselblad 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, Shamooh 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, Emgelgau MM, Jack J, Snyder SR, Carande-Kulis VG, Isham G, Garfield S, Briss 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* 117:762–74, 2004
107. Ellis SE, Speroff T, Dittus RS, Brown A, Pichert JW, Elasy TA: Diabetes patient education: a meta-analysis and meta-regression. *Patient Educ Counsel* 52:97–105, 2004
108. Brown SA: Studies of educational interventions in diabetes care: a meta-analysis revisited. *Patient Educ Counsel* 16:189–215, 1990
109. Armour TA, Norris SL, Jack L Jr, Zhang X, Fisher L: The effectiveness of family interventions in people with diabetes mellitus: a systematic review. *Diabet Med* 10:1295–1305, 2005
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, Tomky D, Weaver T, Yarbrough 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* 31:487–513, 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, Shwide-Slavin C, Silvers BT, O-Sullivan-Maillet J, Pritchett E, American Dietetic Association, Diabetes Care and Education Practice Group, American Dietetic Association: Standards of practice and standards of professional performance for registered dietitians (generalist, specialty, and advanced) in diabetes care. *J Am Dietetic Association* 105:819–824, 2005
118. Blanchard MA, Rose LE, Taylor J, McEntee 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 Ed and 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 CD, 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 care. *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, Malecha 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

- E, Spencet 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, Schillinger D, Scharif 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. Gildea 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. Davis TC, Crouch MA, Wills G, Miller S, Abdehou DM: The gap between patient reading comprehension and the readability of patient education materials. *J Fam Pract* 31:533–538, 1990
  137. Hosey GM, Freeman WL, Stracqualursi F, Gohdes D: Designing and evaluating diabetes education material for American Indians. *Diabetes Educ* 16:407–414, 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, Piette 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: *STOFHLA 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. Shillinger D, Piette 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. Piette 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. *Diabet Med* 22:1379–1385, 2005
  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, Piette JD: Depression increases diabetes symptoms by complicating patients' self-care adherence. *Diabetes Educ* 30:485–492, 2004
  150. Krein SL, Heisler M, Piette JD, Makki F, Kerr EA: The effect of chronic pain on diabetes patients' self-management. *Diabetes Care* 28:65–70, 2005
  151. Piette 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, Baraff LJ, 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, Ofman JJ, Weingarten SR: A systematic review of diabetes disease management programs. *Am J Managed Care* 11:242–50, 2005
  159. Two Feathers J, Kieffer EC, Palmisano 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, Maryniuk M, Peeples M, Peyrot M, Tomky 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.ihl.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.ihl.org/IHI/Topics/ChronicConditions/Diabetes/Measures>. Accessed 24 April 2006