

National Standards for Diabetes Self-Management Education

CAROLÉ MENSING, RN, MA, CDE
(TASK FORCE CHAIR)

JACKIE BOUCHER, MS, RD, LD, CDE
MARJORIE CYPRESS, MS, C-ANP, CDE
KATIE WEINGER, EDD, RN
KATHRYN MULCAHY, MSN, RN, CDE
PATRICIA BARTA, RN, MPH, CDE
GWEN HOSEY, MS, ARNP, CDE
WENDY KOPHER, RN, C, CDE, HTP

ANDREA LASICHAK, MS, RD, CDE
BETTY LAMB, RN, MSN
MAVOURNEEN MANGAN, RN, MS, ANP, C, CDE
JAN NORMAN, RD, CDE
JON TANJA, BS, MS, RPH
LINDA YAU, MS, RD, LD, CDE
KIMBERLYDAWN WISDOM, MD, MS
CYNTHIA ADAMS, PHD

PROBLEM STATEMENT— Diabetes Self-Management Education (DSME) is the cornerstone of care for all individuals with diabetes who want to achieve successful health-related outcomes. The National Standards for DSME are designed to define quality diabetes self-management education that can be implemented in diverse settings and will facilitate improvement in health care outcomes. The dynamic health care process obligates the diabetes community to periodically review and revise these standards to reflect advances in scientific knowledge and health care.

Therefore, the Task Force to review the National Standards for DSME was convened to review the current standards for their appropriateness, relevancy, and scientific basis, and to be sure they are specific and achievable in multiple settings.

PROCEDURE FOR REVISION OF THE NATIONAL STANDARDS FOR DIABETES SELF-MANAGEMENT EDUCATION PROGRAMS

— The Task Force to Review and Revise the National Standards for Diabetes Self-Management Education Programs decided to do the following:

1. Critically review the current standards and prepare an evidence-based review of the literature.
2. Revise the National Standards for Diabetes Self-Management Education Programs as appropriate.

Establishing procedure

The Task Force began this task by outlining a process to be used for accomplishing its charge:

- Examine the adequacy of representation on the Task Force itself to ensure fair, relevant, and impartial revisions of the National Standards (the sponsoring organization for this revision of the National Standards is the American Diabetes Association).
- Perform an initial review of the current standards to identify areas that need to be addressed.
- Collect input from individuals and organizations who utilize the current standards.
- Set a timeline for accomplishing the charge.
- Critically review each standard and perform a review of the literature for each.
- Review new trends in diabetes education and care.
- Review the National Standards to ensure quality and consistency with the current American Diabetes Association Standards of Medical Care.
- Obtain critiques from secondary sources interested or involved in diabetes care.
- Perform a final review of the revised National Standards.
- Recommend the revised National Standards to the organizations represented on the Task Force for their review, endorsement, and implementation.
- Publish the new National Standards.

REPRESENTATION ON THE TASK FORCE

— Representation on the Task Force consisted of individuals from all major organizations and disciplines with significant interest in the provision of quality diabetes care and self-management education. It was decided that payers or purchasers of care would be used only as advisors and not as Task Force members. Thus, the following or-

ganizations, federal agencies, federally funded programs, and disciplines are represented on the Task Force:

Organizations, federal agencies, and federally funded programs

- American Diabetes Association
- American Association of Diabetes Educators
- American Dietetic Association
- Veteran's Health Administration
- Centers for Disease Control and Prevention
- Indian Health Service
- National Certification Board for Diabetes Educators
- Juvenile Diabetes Foundation International
- Diabetes Research and Training Centers

Disciplines

- Behaviorist (EdD)
- Pharmacist (RPh)
- Physician (MD)
- Registered dietitian (RD)
- Registered nurse (RN)

PROCESS— The goal for review, revision, and publication completion was 2 years. The committee first convened in October 1998 and reconvened in January, May, and October 1999. The technical review subgroup convened in July 1999 and then held weekly conference calls from July through October 1999. The entire group reconvened in October 1999 to finalize the proposed draft of the revised standards to share with the represented organizations. The represented organizations were sent the final draft December 1999. All represented organizations approved the revised standards. The final document was submitted for publication in spring 2000.

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.*

In the business literature, case studies and case report investigations on success-

ful management strategies emphasize the importance of clear goals and objectives, defined relationships and roles, and managerial support (1–4). This concept is relatively new in the health care industry. The business literature and health policy experts and organizations have emphasized written commitments, policies, support, and the importance of outcome variables in quality improvement efforts (1,5–16). The continuous quality improvement literature also stresses the importance of developing policies, procedures, and guidelines (1,5).

Documentation of the organizational structure, mission statement, and goals can lead to efficient and effective provision of education programs. Documentation of organizational structure delineates channels of communication, and organizational commitment to educational programs (17–20). According to the Joint Commission on Accreditation of Health Care Organizations (JCAHO) (5), 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 on which to deliver quality diabetes education (1,5,12,14,15).

Standard 2. *The DSME entity will determine its target population, assess educational needs, and identify the resources necessary to meet the self-management educational needs of the target population(s).*

Clarifying the target population and determining self-management educational needs allow health care providers to focus resources and maximize health benefits (14,21–23). The assessment of the population should identify the educational needs of all individuals with diabetes, not just those who frequently attend medical appointments (21). DSME is a critical component of diabetes treatment (24), yet the majority of individuals with diabetes do not receive any formal diabetes education (25). Demographic variables, such as ethnic background, formal education level, reading ability, and barriers to participation in education, must be considered to maximize the effectiveness of self-management education (26–29).

Standard 3. *An established system (committee, governing board, advisory body) involving professional staff and other stakeholders will participate annually in a planning and review process that includes data*

analysis and outcome measurements, and addresses community concerns.

An established system (e.g., committee, governing board, advisory body) provides a forum and mechanism essential for activities that serve to sustain the DSME entity (9,18,19,30,31). Consumer, professional, and community involvement in educational planning and evaluation of outcomes (1,5,12,14,15) can result in DSME that is more responsive to consumer-identified needs, more culturally relevant, and of greater personal interest to consumers (30,32–35).

Standard 4. *The DSME entity will designate a coordinator with academic and/or experiential preparation in program management and the care of individuals with chronic disease. The coordinator will oversee the planning, implementation, and evaluation of the DSME entity.*

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 the accountability and continuity of the educational process (19,36–38). The individual serving as the coordinator will be most effective if there is familiarity with the lifelong process of managing a chronic disease (i.e., diabetes).

Standard 5. *DSME will involve the interaction of the individual with diabetes with a multifaceted education instructional team, which may include a behaviorist, exercise physiologist, ophthalmologist, optometrist, pharmacist, physician, podiatrist, registered dietitian, registered nurse, other health care professionals, and paraprofessionals. DSME instructors are collectively qualified to teach the content areas. The instructional team must consist of at least a registered dietitian and a registered nurse. Instructional staff must be Certified Diabetes Educators (CDEs) or have recent didactic and experiential preparation in education and diabetes management.*

DSME has been shown to be most effective when delivered by a multidisciplinary team with a comprehensive plan of care (39–50). The multidisciplinary team utilized in DSME is one in which the different team members retain their individual disciplinary identity, work interdependently, consult with one another, and have shared goals (51). The team should have a collective combination of expertise in medical treatment, medical nutrition therapy, teaching skills, and behavioral

psychology (8,51–56). It is essential in this collaborative and integrated team approach that individuals with diabetes assume an active role in their care (45).

Nurses have been utilized most often as instructors in the delivery of formal DSME (39,52,57–61). Since the emergence of medical nutrition therapy (40,62–65), registered dietitians have become an integral part of the diabetes education team. In recent years, the role of the diabetes educator has also expanded to other disciplines (8,40–42,51,65–69). Although there is no evidence demonstrating that one discipline is more effective than another, the literature review favors current practice that utilizes the registered nurse and registered dietitian as key members of the multidisciplinary team preparing and assisting in the delivery of DSME (43,44,55,66). In addition to the registered nurse and registered dietitian, a number of articles reflected the ever changing and evolving health care environment and included other health professionals (e.g., physicians, behaviorists, pharmacists, exercise physiologists, ophthalmologists, optometrists, and podiatrists) and paraprofessionals as members of the educational team (41,42,68–75). However, the literature reflects that additional research is needed to demonstrate that these professionals may play a major role on the diabetes education team.

Based on expert consensus, there is support that the primary instructors on the diabetes team require specialized diabetes and educational training beyond their basic academic preparation (57,76–81). Certification as a Diabetes Educator by the National Certification Board for Diabetes Educators (NCBDE) is one way that health care professionals can demonstrate mastery of a specific body of knowledge, and such certification has grown to be the community-accepted credential for DSME (82). According to the NCBDE, there are currently more than 10,000 CDEs in the U.S.

Standard 6. *The DSME instructors will obtain regular continuing education in the areas of diabetes management, behavioral interventions, teaching and learning skills, and counseling skills.*

Studies indicate that instructors without specialized training in diabetes (51,83–89), behavioral interventions (74,76,79,90–92), teaching and learning skills (53,93–97), and counseling skills (78,98) may not focus on patient behavior change, and therefore, clinical outcomes

may not improve. Quality diabetes care and education require that professional staff have continuing education in diabetes educational strategies and behavioral interventions beyond their basic preparation (77,78,85,87,94,98,99). Behavior and lifestyle changes are the keys to successful self-management of diabetes (74,76). Selected studies of health care professionals have shown a need for increased knowledge and ability to utilize behavioral interventions with individuals living with diabetes and other chronic diseases (79,98–101). Therefore, the instructors delivering quality DSME must remain current in therapeutic modalities and medical nutrition therapy, as well as teaching skills and behavioral interventions.

Standard 7. *A written curriculum, with criteria for successful learning outcomes, shall be available. Assessed needs of the individual will determine which content areas listed below are delivered.*

- Describing the *diabetes disease process* and treatment options
- Incorporating appropriate *nutritional management*
- Incorporating *physical activity* into lifestyle
- Utilizing *medications* (if applicable) for therapeutic effectiveness
- *Monitoring* blood glucose, urine ketones (when appropriate), and using the results to improve control
- Preventing, detecting, and treating *acute complications*
- Preventing (through *risk reduction* behavior), detecting, and treating chronic complications
- *Goal setting* to promote health, and *problem solving* for daily living
- Integrating *psychosocial adjustment* to daily life
- Promoting *preconception care*, management during *pregnancy*, and *gestational diabetes management* (if applicable)

The literature supports a strong core group of topics in the design of the curriculum (24,79,80,102–115). The curriculum is defined as a coordinated set of courses and educational experiences to accomplish a set of outcomes (116). The individual with diabetes needs the knowledge and skills to make informed choices, to facilitate self-directed behavior change (24,117,118), and ultimately to reduce the risk of complications (40,44,112). The value of diabetes education is evident from research demonstrating that patients

Table 1—Diabetes education curricula

American Diabetes Association: <i>Life With Diabetes: A Series of Teaching Outlines</i> by the Michigan Diabetes Research and Training Center, 1997
American Association of Diabetes Educators: <i>A Core Curriculum for Diabetes Education, Third Edition</i> , 1998

who never received diabetes education showed a striking fourfold increased risk of a major complication (119).

The content areas above provide instructors with an outline for developing this content. These content areas are presented in behavioral terms and thereby guide the instructor toward creative delivery methods that promote behavior change rather than simply acquisition of knowledge. The above-listed content areas are designed to be applicable in all settings. They represent topics that can be developed in basic, intermediate, and advanced levels (see Table 1 for examples of published diabetes education curricula). Research is needed to develop further a validated core curriculum.

Process

Standard 8. *An individualized assessment, development of an educational plan, and periodic reassessment between participant and instructor(s) will direct the selection of appropriate educational materials and interventions.*

Each participant or significant other living with diabetes brings unique life experiences and preferences to an encounter that help determine the intervention. The assessment includes relevant medical history, cultural influences, health beliefs and attitudes, diabetes knowledge, self-management skills and behaviors, readiness to learn, cognitive ability, physical limitations, family support, and financial status (26,27,54,120–122).

Multiple studies evaluating attitudes and beliefs toward diabetes indicate the importance of individualizing education plans based on the assessment (25,40,54,117,120,123–134). The bulk of the literature supports the importance of attitudes and health beliefs in diabetes care outcomes (40,53,54,135–139).

Periodic individualized reassessment determines attainment of the educational objectives or the need for additional and creative interventions and future reassessment (80,128,140–142).

Standard 9. *There shall be documentation of the individual's assessment, education plan, intervention, evaluation, and follow-up in the permanent confidential education record. Documentation also will provide evidence of collaboration among instructional staff, providers, and referral sources.*

Documentation of patient encounters in the education record guides the educational and medical process, provides evidence of communication among instructional staff, providers, and referral sources, and may prevent duplication of services (143–147). It is only through documentation in the record that information on quality of diabetes care and adherence to practice guidelines can be reviewed (145,148). The use of evidence-based performance and outcome measures has been adopted by organizations and initiatives such as the Health Care Financing Administration (HCFA), the National Committee for Quality Assurance (NCQA), the Diabetes Quality Improvement Project (DQIP), the Health Plan Employer Data and Information Set (HEDIS), and JCAHO (149–151).

Research suggests that the development of standardized procedures for documentation, training of 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 (148,152,153).

Outcomes

Standard 10. *The DSME entity will utilize a continuous quality improvement process to evaluate the effectiveness of the education experience provided, and determine opportunities for improvement.*

Continuous quality improvement (CQI) is an effective methodology for the development, implementation, maintenance, and enhancement of quality DSME (3,11,154,155). The effectiveness of any systematic educational effort is dependent on clearly defining set organizational goals, collecting and analyzing data, and identifying and implementing process improvement measures (155). CQI involves continuing quantitative and qualitative analysis of processes (4), and health and satisfaction outcomes.

The CQI process relies on a demonstrated organizational commitment to provide quality DSME, and an ongoing effort by all organization and DSME team members to meet the needs and expectations of individuals with diabetes and other consumers (6,10–12,15,139,156).

Table 2—Scope of practice guidelines

American Association of Diabetes Educators and the American Nurses Association: Scope and standards of diabetes nursing, 1998

American Dietetic Association: American Dietetic Association Standards of professional practice for dietetics professionals, 1998

Quality improvement goals and objectives are consistent with the organizational goals and are based on an assessment of the DSME entity's target populations (14).

Evaluation is planned as an essential step in the provision of quality DSME to determine if DSME goals and objectives are met (157). Monitoring participant progress (medical and behavioral) and best practices are critical to the success of DSME and can be used as a basis for quality improvement (158–162). To measure outcomes effectively, data must be collected over time and data collection instruments administered on multiple occasions.

RECOMMENDATIONS FOR OVERSIGHT AND FUTURE REVIEWS

DSME is an integral part of diabetes care and, like many aspects of health care, is an evolving process. The standards provide a benchmark for quality assessment of DSME. Standards for DSME must be based on a combination of the best scientific evidence and best practice where evidence is lacking (see Table 2 for Scope of Practice Guidelines). As new research emerges, the standards will need to be revised, and translation of the research incorporated into the practice of diabetes education. With this in mind, the Task Force recommends the following:

- The National Standards should be reviewed and revised every 5 years or sooner if research findings indicate a need for significant changes to support evidenced-based practice.
- Participating organizations would share responsibility for coordination of the review process on a voluntary and mutually agreeable rotation schedule.
- All represented organizations should be charged with collecting data on structure, process, and outcomes of diabetes education during the interim 5-year period.

- Our exhaustive review of the literature reveals that behavioral and educational research is increasing; however, more outcomes research is needed in the area of educational and behavioral interventions and provider characteristics to prove that diabetes educational efforts improve outcomes. We look forward to greater efforts in behavioral and educational research (163).
- Behavioral research funding must be given greater attention by the Federal government and agencies such as American Association of Diabetes Educators, American Diabetes Association, Centers for Disease Control and Prevention, Indian Health Service, National Institutes of Health, and others.

DEFINITION OF TERMS— This list was developed by the Task Force to assist in the CQI process of revision of the standards and adapted several definitions from the Center for Health Promotion's Operational Terms & Definitions (164).

best practice—A strategy or process that has been demonstrated to solve a problem, improve results, and is replicable.

clients—All individuals affected by diabetes, including people with diabetes, family members, caregivers, and significant others.

community—The social, cultural, political, and geographic environment of the DSME and its target population.

continuous quality improvement (CQI)—A cyclic series of steps designed to enhance DSME processes leading to improved patient and program outcomes. Steps include the following: identify the opportunity for improvement, collect data, analyze data, choose an approach, develop the concepts and processes, implement, evaluate and improve.

criteria—A rule or test upon which a judgment or decision can be based.

diabetes self-management education (DSME)—An interactive, collaborative, ongoing process involving the person with diabetes and the educator(s). This process includes 1) assessment of the individual's specific education needs; 2) identification of the individual's specific diabetes self-management goals; 3) education and behavioral intervention directed toward helping the individual achieve identified self-management goals; 4) evaluation of the individual's attainment of identified self-management goals (revised from *Report of the Task Force on the Delivery of Diabetes Self-Management*

Education and Medical Nutrition Therapy, Diabetes Spectrum, Vol. 12, No. 1, 1999).

educational intervention—An exchange of knowledge, tools, and practices that will address the client's assessed DSME needs.

evaluation—The act of examining DSME processes and outcomes to ascertain whether the desired goals and objectives were achieved.

evidence-based—Data or expert opinion which serves as proof or testimony.

expert opinion—Beliefs expressed by individual(s) who have mastered the content of a specific area.

health professional—An individual with a license/certification/registration in a health-related field, college degree.

instructional staff—Multidisciplinary and multifaceted, experienced, skilled health professionals who work with the client in the process of DSME.

medical nutrition therapy—See *J Am Diet Assoc* 94:838–839, 1994 (Identifying patients at risk: ADA's definition for screening and nutrition assessment).

multidisciplinary—More than one discipline.

paraprofessional—Community members who serve as connectors between health care consumers and providers to promote health among groups that have traditionally lacked access to adequate care.

participant—Person with diabetes and/or family and significant other.

services—Those systems, which are derived through clear objectives and goals, that arise from the definitions of function and mission. Accomplishments and performance deal systematically with priorities, measurements, feedback, organized audit of objectives, and results.

stakeholder—A person who has a vested interest (gains or losses) in what will be learned from an evaluation and how that knowledge will be utilized. Includes individuals in program operation; those served.

standard—A delineation of acceptable levels of practice consisting of qualitative or quantitative parameters utilized in evaluation.

target population(s)—A group of individuals who meet defined specifications (e.g., age, sex, race/ethnicity, income, type of diabetes, health status, geographic location, etc.) to whom DSME activities are offered.

Acknowledgments— We thank Carol Kennedy, RN, MA; Lynn Moseley, RD, MPH;

Marilyn Gerde, RN, BSN; and Theresa Barraclough of the American Diabetes Association Education Recognition Program for their assistance with the work of the National Standards Revision Task Force.

References

1. Deming WE: *Out of the Crisis*. Cambridge, MA, Massachusetts Institute of Technology, 1986
2. 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, 1954
3. Drucker PF: *Management: Tasks, Responsibilities, Practices*. New York, Harper & Row, 1984
4. Garvin DA: The processes of organization and management. *Sloan Manage Rev*: 30–50, summer 1998
5. Joint Commission on Accreditation of Healthcare Organizations: *Framework for Improving Performance*. Oakbrook Terrace, IL, Joint Commission on Accreditation of Healthcare Organizations, 1994
6. Berwick DM: A primer on leading the improvement of systems. *BMJ* 312:619–622, 1996
7. Clemmer TP, Spuhler VJ, Berwick DM, Nolan TW: Cooperation: the foundation of improvement. *Ann Intern Med* 128:1004–1009, 1998
8. Courtney L, Gordon M, Romer L: A clinical path for adult diabetes. *Diabetes Educ* 23:664–671, 1997
9. Dedgeling D, Salkeld G, Dowsett J, Fahy P: Patient education policy and practice in Australian hospitals. *Patient Educ Couns* 15:127–138, 1990
10. Laffel GL, Berwick DM: Quality in health care. *JAMA* 268:407–409, 1992
11. Laffel GL, Berwick DM: Quality health care. *JAMA* 270:254–255, 1993
12. Laffel G, Blumenthal D: The case for using industrial quality management science in health care organizations. *JAMA* 262: 2869–2873, 1989
13. 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
14. 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. *Arch Fam Med* 5:502–506, 1996
15. Garvin DA: Leveraging processes for strategic advantage. *Harvard Bus Rev*: Sept.-Oct. 1995
16. Von Korff M, Gruman J, Schaefer J, Curry SJ, Wagner EH: Collaborative management of chronic illness. *Ann Intern Med* 127:1097–1102, 1997
17. Fox CH, Mahoney MC: Improving diabetes preventative care in a family practice residency program: a case study in continuous quality improvement. *Fam Med* 30: 441–445, 1998
18. Giloth BE: Management of patient education in US hospitals: evolution of a concept. *Patient Educ Couns* 15:101–111, 1990
19. 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
20. Mangan M: Diabetes self-management education programs in the Veterans Health Administration. *Diabetes Educ* 23:687–695, 1997
21. O'Connor PJ, Pronk NP: Integrating population health concepts, clinical guidelines, and ambulatory medical care systems to improve diabetes care. *J Ambulatory Care Manage* 21:67–73, 1998
22. Pronk NP, O'Connor PJ: Systems approach to population health improvement. *J Ambulatory Care Manage* 20:24–31, 1997
23. Barth R, Campbell LV, Allen S, Jupp JJ, Chisholm DJ: Intensive education improves knowledge, compliance, and foot problems in type 2 diabetes. *Diabet Med* 8:111–117, 1991
24. Padgett D, Mumford E, Hynes M, Carter R: Meta-analysis of the effects of educational and psychosocial interventions on the management of diabetes mellitus. *J Clin Epidemiol* 41:1007–1030, 1988
25. 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
26. 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
27. Hosey GM, Freeman WL, Stracqualursi F, Gohdes D: Designing and evaluating diabetes education material for American Indians. *Diabetes Educ* 16:407–414, 1990
28. Glasgow RE, Toobert DJ, Hampson SE: Participation in outpatient diabetes education programs: how many take part and how representative are they? *Diabetes Educ* 17:376–380, 1991
29. Kumanyaka SK, Obarzanek E, Stevens VJ, Herbert PR, Whelton PK: Weight-loss experience of black and white participants in NHLBI-sponsored clinical trials. *Am J Clin Nutr* 53:1631S–1638S, 1991
30. Butterfoss D, Goodman RM, Wandersman A: Community coalitions for prevention and health promotion: factors predicting satisfaction, participation, and planning. *Health Educ Q* 23:65–79, 1996
31. Cochran LH, Phelps LA, Cochran LL: Advisory committee in action. *Perspectives on Advisory Committees*, no date cited
32. Braithwaite RL, Murphy F, Lythcott N, Blumenthal DS: Community organization and development for health promotion within an urban black community: a conceptual model. *Health Educ* 20:56–60, 1989
33. Goodman RM, Speers MA, McLeroy K, Fawcett S, Kegler M, Parker E, Smith SR, Sterling TD, Wallerstein N: Identifying and defining the dimensions of community capacity to provide a basis for measurement. *Health Educ Behav* 25:258–278, 1998
34. CDC/ATSDR Committee on Community Engagement: *Principles of Community Engagement*, no date cited
35. First World Health Assembly: Health promotion, May 1998
36. Johnson K, Schubring L: The evolution of a hospital-based decentralized case management model. *Nurs Econ* 17:29–48, 1999
37. Diabetes Control and Complications Trial Research Group: The Diabetes Control and Complications Trial: the trial coordinator perspective. *Diabetes Educ* 15:236–241, 1989
38. 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
39. 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. *Ann Intern Med* 129:605–612, 1998
40. 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
41. Pfizer Inc, Glaxo-Wellcome: The Asheville Project: a special report. *Pharm Times Suppl*, Romaine Pearson Publication, October 1998
42. 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
43. Diabetes Control and Complications Trial Research Group: Implementation protocols in the Diabetes Control and Complications Trial. *Diabetes Care* 18: 361–376, 1995
44. Diabetes Control and Complications

- Trial Research Group: The effect of intensive treatment of diabetes on the development of long-term complications in insulin-dependent diabetes mellitus. *N Engl J Med* 14:977-986, 1993
45. Schultz JF, Sheps SG: Management of patients with hypertension: a hypertension clinic model. *Mayo Clin Proc* 69: 997-999, 1994
 46. Abourizk NN, O'Connor PJ, Crabtree BF, Schnatz JD: An outpatient model of integrated diabetes treatment and education: functional, metabolic, and knowledge out-comes. *Diabetes Educ* 20:416-421, 1994
 47. Franz MJ, Splett PL, Monk A, Barry B, McLain K, Weaver T, Upham P, Bergental R, Mazze RS: Cost effectiveness of medical nutrition therapy provided by dietitians for persons with non-insulin-dependent diabetes mellitus. *J Am Diet Assoc* 95: 1018-1024, 1995
 48. Etzweiler D: Chronic care: a need in search of a system. *Diabetes Educ* 23:569-573, 1997
 49. Etzweiler D: Primary-care teams and a systems approach to diabetes management. *Clin Diabetes* 12:50-52, 1994
 50. Hirsch IB: The status of the diabetes team. *Clin Diabetes* 16:145-146, 1998
 51. Mazze R, Albin J, Friedman J, Hahn S, Murphy JA, Reese P, Rosen S, Scaggs C, Shamoon 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
 52. 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
 53. 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
 54. 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
 55. Levetan CS, Salas JR, Willets IF, Zurnoff B: Impact of endocrine and diabetes team consultation on hospital length of stay for patients with diabetes. *Am J Med* 99: 22-28, 1995
 56. Hendricks LE, Hendricks RT: Teaming up with a certified diabetes educator: how and why it's beneficial for the primary-care physician. *Pract Diabetology* 16:22-23, 1997
 57. Davis ED: Role of the diabetes nurse educator in improving patient education. *Diabetes Educ* 16:36-43, 1990
 58. Feddersen E, Lockwood DH: An inpatient diabetes educator's impact on length of hospital stay. *Diabetes Educ* 20: 125-128, 1994
 59. Edelstein EL, Cesta TG: Nursing case management: an innovative model of care for hospitalized patients with diabetes. *Diabetes Educ* 19:517-521, 1993
 60. 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
 61. Spellbring AM: Nursing's role in health promotion. *Nurs Clin North Am* 26:805-814, 1991
 62. 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
 63. 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
 64. 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
 65. Khakpour D, Thompson L: The nutrition specialist on the diabetes management team. *Clin Diabetes* 16:21-22, 1998
 66. Franz MJ, Callahan T, Castle G: Changing roles: educators and clinicians. *Clin Diabetes* 12:53-54, 1994
 67. 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
 68. 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
 69. Huff PS, Ives TJ, Almond SN, Griffin NW: Pharmacist-managed diabetes education service. *Am J Hosp Pharm* 40:991-993, 1983
 70. Brownstein JN, Wiggins N, Rosenthal EL, Meister JS, Lacey Y, Muhammad A: Roles and competencies of urban and rural community health advisors: findings and implications for practice from the national community health advisor study. Centers for Disease Control and Prevention: The Community Health Worker (no year cited)
 71. Corkery E, Palmer C, Foley ME, Schechter CB, Frisher L, Roman SH: Effect of a bicultural community health worker on completion of diabetes education in a Hispanic population. *Diabetes Care* 20:254-257, 1997
 72. Gary TL, Batts ML, Bone L, Cummings Y, Hill M, Levine D, Maguire M, Saudek C, Brancati FL: Effect of behavioral interventions on body-mass index, diet, and physical activity in urban African Americans with type 2 diabetes. *Diabetes* 48 (Suppl. 1):A37, 1999
 73. 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
 74. 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
 75. 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
 76. Anderson RM, Donnelly MB, Gressard CP: The attitudes of nurses, dietitians, and physicians toward diabetes. *Diabetes Educ* 17:261-268, 1991
 77. 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
 78. 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
 79. 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
 80. 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
 81. Flavin K, White N: The intensive insulin therapy team. *Diabetes Educ* 15:249-252, 1989
 82. 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
 83. Boulton AJ: Why bother educating the multi-disciplinary team and the patient? The example of prevention of lower extremity amputation in diabetes. *Patient Educ Couns* 26:183-188, 1995
 84. Drass JA, Muir-Nash J, Boykin P, Turek J, Baker K: Perceived and actual level of

- knowledge of diabetes mellitus among nurses. *Diabetes Care* 12:351-356, 1989
85. Gossain VV, Bowman KA, Rovner DR: The actual and self-perceived knowledge of diabetes among staff nurses. *Diabetes Educ* 19:215-219, 1993
 86. Litzelman DK, Slemenda CW, Langefeld CD, Hays LM, Welch MA, Bild DE, Ford ES, Vinicor ES: Reduction of lower extremity clinical abnormalities in patients with non-insulin-dependent diabetes mellitus: a randomized, controlled trial. *Ann Intern Med* 119:36-41, 1993
 87. Ruby KL, Blainey CA, Hass LB, Patrick M: The knowledge and practices of registered nurse, certified diabetes educators: teaching elderly clients about exercise. *Diabetes Educ* 19:299-306, 1993
 88. Scheiderich SD, Freibaum CN, Peterson LM: Registered nurses knowledge about diabetes mellitus. *Diabetes Care* 6:57-61, 1983
 89. Woolridge J, Bergeron J, Thornton C: Preventing diabetic foot disease: lessons from the Medicare shoe demonstration. *Am J Public Health* 86:935-938, 1996
 90. Grey M, Boland EA, Davidson M, Yu C, Tamborlane WV: Coping skills training for youths with diabetes on intensive therapy. *Appl Nurs Res* 12:3-12, 1999
 91. Kaufman MW, All AC, Davis H: The scope and practice of diabetes educators in the state of Georgia. *Diabetes Educ* 25:56-63, 1999
 92. Stott NCH, Rees M, Rollnick S, Pill RM, Hackett P: Professional responses to innovation in clinical method: diabetes care and negotiating skills. *Patient Educ Couns* 29:67-73, 1996
 93. Greene DS, Beaudin BP, Bryan JM: Addressing attitudes during diabetes education: suggestions from adult education. *Diabetes Educ* 17:470-473, 1991
 94. Jayne RL, Rankin SH: Revisiting nurse knowledge about diabetes: an update and implications for practice. *Diabetes Educ* 19:497-502, 1993
 95. Lorenz RA: Teaching skills of health professionals. *Diabetes Educ* 15:149-152, 1989
 96. Maldonato A, Bloise D, Ceci M, Fraticelli E, Fallucca F: Diabetes mellitus: lessons from patient education (Abstract). *Patient Educ Couns* 26:57-66, 1995
 97. Moriarty D, Stephens L: Factors that influence diabetes patient teaching performed by hospital staff nurses. *Diabetes Educ* 16:31-35, 1990
 98. Stetson BA, Pichert JW, Roach RR, Lorenz RA, Boswell EJ, Schlundt DG: Registered dietitians' teaching and adherence promotion skills during routine patient education. *Patient Educ Couns* 19:273-280, 1992
 99. Anderson RM, Donnelly MB, Funnell MM, Johnson PD: The continuing education needs of diabetes nurse educators. *J Continuing Educ Nurs* 22:163-166, 1991
 100. Brown SL, Pope JF, Hunt AE, Tolman NM: Motivational strategies used by dietitians to counsel individuals with diabetes. *Diabetes Educ* 24:313-318, 1998
 101. Pill R, Stot NC, Rollnick SR, Rees M: A randomized controlled trial of an intervention designed to improve the care given in general practice to type II diabetic patients: patient outcomes and professional ability to change behavior. *Fam Pract* 15:229-235, 1998
 102. Armstrong CL, Brown LP, York R, Robbins D, Swank A: From diagnosis to home management: nutritional considerations for women with gestational diabetes. *Diabetes Educ* 17:455-459, 1991
 103. Baker SB, Vallbona C, Pavlik V, Fasser CE, Armbruster M, McCray R, Baker R: A diabetes control program in a public health care setting. *Public Health Rep* 108:595-605, 1993
 104. Carlson A, Rosenqvist U: Diabetes care organization, process, and patient outcomes: effects of a diabetes control program. *Diabetes Educ* 17:42-48, 1991
 105. Colagiuri R, Colaguirri S, de Blicck C, Naidu V: Quality assurance of individual diabetes patient education. *Diabetes Educ* 20:521-525, 1994
 106. Dann Urban A, Andrews Rearson MA, Murphy K: The diabetes center home care nurse: an integral part of the diabetes team. *Diabetes Educ* 24:608-611, 1998
 107. Funnell MM, Arnold MS, Fogler J, Merritt JH, Anderson LA: Participation in a diabetes education and care program: experience from the diabetes care for older adults project. *Diabetes Educ* 23:163-167, 1997
 108. Green Pastors J: Alternatives to the exchange system for teaching meal planning to persons with diabetes. *Diabetes Educ* 18:57-62, 1992
 109. Hinson J, Riordan K, Hemphill D, Randolph C, Fonseca V: Hypertension education: an important and neglected part of the diabetes education curriculum? *Diabetes Educ* 23:166-170, 1997
 110. Klepac M: Theory and practical applications of a wellness perspective in diabetes education. *Diabetes Educ* 22:225-229, 1996
 111. Lowe DH, Hogue JK, Delcher HK: Evolution of a progressive self-directed diabetes education model. *Diabetes Educ* 20:199-202, 1994
 112. Peyrot M, Rubin RR: Modeling the effect of diabetes education on glycemic control. *Diabetes Educ* 20:143-148, 1994
 113. Ruggiero L: Provider guidelines for improving diabetes self-management. *Med Health Rhode Island* 31:355-357, 1998
 114. Michael SR, Sabo CE: The challenge of conducting clinical research in diabetes care and education. *Diabetes Educ* 22:23-27, 1996
 115. Sidorov J, Harris R: The integrated approach to diabetes mellitus: the impact of clinical information systems, consumerism, and managed care. *Diabetes Spectrum* 9:158-163, 1996
 116. Karni K, Duckett L, Garloff D, Larson T, Garrard J, Thawley D, Franks R: Key elements and processes needed in curriculum design. *Clin Lab Sci* 11:70-77, 1998
 117. Brown SA: Effects of educational interventions in diabetes care: a meta-analysis of findings. *Nurs Res* 37:223-230, 1988
 118. Brown SA: Studies of educational interventions and outcomes in diabetic adults: a meta-analysis revisited. *Patient Educ Couns* 16:189-215, 1990
 119. Nicolucci A, Cavaliere D, Scorpiglione N, Carinci F, Capani F, Tognoni G, Benedetti MM: A comprehensive assessment of the avoidability of long-term complications of diabetes. *Diabetes Care* 19:927-933, 1996
 120. Davis WK, Hull AL, Boutaugh ML: Factors affecting the educational diagnosis of diabetic patients. *Diabetes Care* 4:275-278, 1981
 121. Carter JS, Gilliland SS, Perez GE, Levin S, Broussard BA, Valdez L, Cunningham-Sabo LD, Davis SM: Native American diabetes project: designing culturally relevant education materials. *Diabetes Educ* 23:133-134, 1997
 122. Thomson FJ, Masson EA: Can elderly patients co-operate with routine foot care? *Diabetes Spectrum* 8:218-219, 1995
 123. Anderson RM, Fitzgerald JT, Oh M: The relationship between diabetes-related attitudes and patients' self-reported adherence. *Diabetes Educ* 19:287-292, 1993
 124. Beeney LJ, Dunn SM: Knowledge improvement and metabolic control in diabetes education: approaching the limits? *Patient Educ Couns* 16:217-229, 1990
 125. D'Eramo-Melkus GA, Wylie-Rosett J, Hagan JA: Metabolic impact of education in NIDDM. *Diabetes Care* 15:861-868, 1992
 126. Dolan Mullen P, Green LW, Persinger GS: Clinical trials of patient education for chronic conditions: a comparative meta-analysis of intervention types. *Prev Med* 14:753-781, 1985
 127. Duchin SP, Brown SA: Patients should participate in designing diabetes educational content. *Patient Educ Couns* 16:255-267, 1990
 128. Estey AL, Tan MH, Mann K: Follow-up intervention: its effect on compliance behavior to a diabetes regimen. *Diabetes Educ* 16:291-295, 1990
 129. Glasgow RE: A practical model of diabetes management and education. *Diabetes Care* 18:117-126, 1995
 130. Glasgow RE: Behavioral and psychoso-

- cial measures for diabetes care: what is important to assess? *Diabetes Spectrum* 10:12-17, 1997
131. Greenfield S, Kaplan SH, Ware JE Jr, Yano EM, Frank HJ: Patients' participation in medical care: effects on blood sugar control and quality of life in diabetes. *J Gen Intern Med* 3:448-457, 1988
 132. Rosenstock IM, Strecher VJ, Becker MH: Social learning theory and the health belief model. *Health Educ Q* 15:175-183, 1988
 133. Wise PH, Dowlatshahi DC, Farrant S, Fromson S, Meadows KA: Effect of computer-based learning on diabetes knowledge and control. *Diabetes Care* 9:504-508, 1986
 134. Wooldridge KL, Wallston KA, Graber AL, Brown AW, Davidson P: The relationship between health beliefs, adherence, and metabolic control of diabetes. *Diabetes Educ* 18:495-500, 1992
 135. Dunn S: Rethinking the models and modes of diabetes education. *Patient Educ Couns* 16:281-286, 1990
 136. Kurtz SMS: Adherence to diabetes regimens: empirical status and clinical applications. *Diabetes Educ* 16:50-56, 1990
 137. Kvam SH, Lyons JS: Assessment of coping strategies, social support, and general health status in individuals with diabetes mellitus. *Psychol Rep* 68:623-632, 1991
 138. Maiman LA, Becker MH, Kirscht JP, Haefner DP, Drachman RH: Scales for measuring health belief model dimensions: a test of predictive value, internal consistency, and relationships among beliefs. *Health Educ Monographs* 5:215-231, 1977
 139. Young WB, Minnick AF, Marcantonio R: How wide is the gap in defining quality care? *J Nurs Adm* 26:15-20, 1996
 140. Clement S: Diabetes self-management education (Technical Review). *Diabetes Care* 18:1204-1214, 1995
 141. Funnell MM, Anderson RM: Patient education in the physician's office. *Pract Diabetology* 11:22-25, 1993
 142. Mazzuca SA, Moorman NH, Wheeler ML, Norton JA, Fineberg NS, Vinicor F, Cohen SJ, Clark CM: The diabetes education study: a controlled trial of the effects of diabetes patient education. *Diabetes Care* 9:1-10, 1986
 143. Claflin N, Hayden CT: Interdisciplinary patient and family education. *J Health Q* 18:16-21, 1996
 144. Covington DL, Maxwell JG, Clancy TV, Churchill P, Ahrens W: Poor hospital documentation of violence against women. *J Trauma Inj Infect Crit Care* 38:412-416, 1995
 145. Liesenfeld B, Heekeren H, Schade G, Hepp KD: Quality of documentation in medical reports of diabetic patients. *Int J Qual Health Care* 8:537-542, 1996
 146. Ross RT, Hammen PF, Frantz EI, Paré LE, Boyd CR: Gunshot wounds: evaluating the adequacy of documentation at a level I trauma center. *J Trauma Inj Infect Crit Care* 45:151-152, 1998
 147. South Dakota State Medical Association: Medical record documentation: is yours a help or a hindrance in a lawsuit? *J Med S Dakota State Med Assn* 51:51-52, 1998
 148. Madlon-Kay DJ: Use of a structured encounter form to improve well-child documentation. *Arch Fam Med* 7:480-483, 1998
 149. 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
 150. Lorber D: Letters, we get letters. . . *Pract Diabetology* 17:32-33, Dec 1999
 151. Young-Hyman D: Provider impact in diabetes education. *Diabetes Educ* (Suppl.) 25:34-42, 1999
 152. Grebe SKG, Smith RBW: Clinical audit and standardised follow up improve quality of documentation in diabetes care. *N Z Med J* 108:339-342, 1995
 153. 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
 154. Basa RP, McLeod B: Evaluation of a diabetes specialty center: structure, process, and outcome. *Patient Educ Couns* 25: 23-29, 1995
 155. Gerber J: Implementing quality assurance programs in multigroup practices for treating hypercholesterolemia in patients with coronary artery disease. *Am J Cardiol* 80:57H-61H, 1997
 156. Noel PH, Larme AC, Meyer J, Marsh G, Correa A, Pugh JA: Patient choice in diabetes education curriculum. *Diabetes Care* 21:896-901, 1998
 157. Bartholomew LK, Parcel GS, Kok G: Intervention mapping: a process for developing theory- and evidence-based health education programs. *Health Educ Behav* 25:545-563, 1998
 158. Thompson A: Setting standards in diabetes education. *Nurs Standard* 14:25-28, 1993
 159. Tildesley HD, Mair K, Sharpe J, Piaseczny M: Diabetes teaching: outcome analysis. *Patient Educ Couns* 19:59-65, 1996
 160. Thacker SB, Koplan JP, Taylor WR, Hinman AR, Katz MF, Roper WL: Assessing prevention effectiveness using data to drive program decisions. *Public Health Rep* 109:187-194, 1994
 161. Tilly KF, Belton AB, McLachlan JFC: Continuous monitoring of health status outcomes: experience with a diabetes education program. *Diabetes Educ* 21: 413-419, 1995
 162. Beaudin CL: Outcomes measurement: application of performance standards and practice guidelines in managed behavioral healthcare. *J Nurs Care Qual* 13: 14-26, 1998
 163. American Association of Diabetes Educators: Diabetes Educational and Behavioral Research Summit. *Diabetes Educ* (Suppl.) 25:1999
 164. Center for Health Promotion Operational Terms & Definitions. Number 6. Health Partners, 1999