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## In Brief

This article provides a brief overview of different approaches to mobilize peer support for diabetes self-management support and evidence to date on the effectiveness of each of these models with an emphasis on research into ways to extend face-to-face programs using innovative technologies. It concludes with a discussion of directions for future research in this area.

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# Overview of Peer Support Models to Improve Diabetes Self-Management and Clinical Outcomes

Michele Heisler, MD, MPA

The success of therapies for diabetes depends on the ability of adults with diabetes to successfully sustain effective self-management behaviors: taking prescribed medications, following diet and exercise regimens, self-monitoring, and coping emotionally with the rigors of living with diabetes. Yet, many patients face multiple barriers to effective diabetes self-management. These include lack of sufficient knowledge of diabetes or its treatment, lack of self-confidence or skills to manage diabetes well, lack of financial resources for medications and supplies, and other comorbidities and physical limitations. In addition, many adults with diabetes lack effective support from their families and friends for their diabetes self-management. This lack represents an often-neglected barrier to successful diabetes care and self-management.<sup>1</sup>

Productive health care visits and nurse case management programs are important means of supporting patients' diabetes self-management but alone often cannot adequately meet many patients' needs. The time allotted for an outpatient visit is often

inadequate to address all of the questions that a patient has about self-care, and nurses and care managers have the challenge of regularly communicating with a large, dispersed panel of patients and tailoring that communication to each individual's needs. Moreover, although research has shown that intensive care management interventions, such as face-to-face or telephone contact with a nurse care manager between medical visits, are effective for patients with high-risk chronic diseases, such as diabetes and heart failure,<sup>2,3</sup> these programs are labor- and resource-intensive. Many health care systems lack the resources to implement intensive nurse-led case management programs.

Higher levels of social support—especially illness-specific or regimen-specific support—are associated with better diabetes and other illness self-management.<sup>1,4-8</sup> Moreover, observational studies suggest that providing social support to others may result in health benefits comparable to—or even greater than—receiving support. Individuals who provide

social support through volunteering experience less depression,<sup>9,10</sup> heightened self-esteem and self-efficacy,<sup>11</sup> and improved quality of life, even after adjusting for baseline health status and socioeconomic status.<sup>12,13</sup> Furthermore, providing support to others can lead to improved health behaviors on the part of the helper,<sup>14</sup> decreased mortality risk,<sup>15,16</sup> and improved health outcomes and functioning.<sup>12,17,18</sup> These benefits are especially strong among those who are elderly and have fewer opportunities to contribute to the well-being of others.<sup>10,19</sup> Many older diabetic patients lack not only an extensive social network, but also opportunities to be of service formerly available through jobs or taking care of children.

Peer support among patients with the same chronic health problem may be a particularly potent intervention, combining the benefits of both receiving and providing social support. "Peer support" is defined as "support from a person who has experiential knowledge of a specific behavior or stressor and similar characteristics as the target population."<sup>20</sup> Peer support helps reduce problematic health behaviors,<sup>19</sup> depression,<sup>20,21</sup> and, in several randomized controlled trials, has contributed to improved diabetes management, including improving behaviors related to medication adherence, diet, exercise, and blood glucose monitoring.<sup>22-25</sup> The success of peer support appears to be due in part to the nonhierarchical, reciprocal relationship that is created through the sharing of similar life experiences.<sup>19,20</sup> These findings are consistent with the longstanding tradition of group therapy and mutual support groups as a means of improving psychosocial outcomes for patients with substance abuse and other chronic conditions.<sup>26-29</sup> Thus, both the intensity and mechanisms linking peer support to health outcomes are different from and likely complementary to those provided by health care provider services. Equally important, peer support interventions, by training and employing volunteers or non-professional staff members, are much less resource-intensive than traditional case management models. In this regard, peer support models are especially promising for safety net

providers and public health systems facing severe resource constraints.

Peer support is especially beneficial when patients with chronic diseases are tackling challenging new medical tasks, such as insulin management. Sharing experiences with others undergoing the same medical or behavioral tasks is an effective means of gaining mastery of tasks and improving disease outcomes.<sup>23,30,31</sup> In addition, assimilating new knowledge and appraisals through mutual exchange of experiences occurs more effectively when presented by peers with whom individuals identify and share common experiences. Among peers, those who take on the helper role gain competency in the target medical or behavioral task as much as those who are helped.<sup>14,32</sup> Moreover, the more homogeneous the peers are (i.e., partners with similar life experiences and age), the more likely support will lead to understanding, empathy, and mutual help.<sup>33</sup>

Interventions that mobilize and build on peer support are an especially promising way to improve self-management support for patients with diabetes. The most effective models appear to combine peer support with a more structured program of education and assistance. To date, most efforts to increase self-management and peer support among patients with chronic conditions have focused on clinic-based group visits, peer-led training sessions, and support groups. Peer-to-peer<sup>34,35</sup> and clinician-led<sup>36-38</sup> group visits and training sessions<sup>34,35</sup> improve outcomes for patients with diabetes and other chronic diseases.<sup>39-41</sup> Yet, many patients face difficulties attending regular face-to-face meetings. Even in the most successful trials of face-to-face group visits<sup>36,42</sup> and self-management training sessions,<sup>34,35</sup> many participants do not attend the sessions. Thus, it is useful to examine the range of different models for effectively mobilizing peer support in conjunction with health care provider support to improve outcomes.

This article provides a brief overview of different approaches to mobilize peer support for diabetes self-management support and evidence to date on the effectiveness of each model with an emphasis on research into ways to extend face-to-face programs using innovative technologies. It concludes with a discussion of

directions for future research. A more in-depth description of different peer support models and a logistical guide to developing and implementing different peer support programs can be found in the 2006 California Health Care Foundation Report, "Building Peer Support Programs to Manage Chronic Disease: Seven Models for Success."<sup>43</sup>

### Face-to-Face Self-Management Programs

There is strong evidence for the benefits of face-to-face group self-management programs that combine discussion of key self-management issues participants are facing, peer exchange and support, and behaviorally based approaches to strengthen participants' diabetes care self-efficacy, problem-solving skills, and efforts to set and follow through on specific behavioral goals. Programs employed in randomized, controlled trials to improve diabetes self-management and clinical outcomes include health professional-led programs based on empowerment theory, in which the leader serves primarily as a facilitator with primarily participant-defined agendas,<sup>44</sup> as well as more structured self-management training following a set curriculum led by trained peer leaders who often themselves have diabetes.<sup>34,35</sup>

Self-management training programs seek to provide information and promote behavioral skills that will help patients carry out the tasks necessary to live as well as possible with chronic illness. These skills include dealing with stress, managing and monitoring symptoms, carrying out biomedical tasks, navigating health systems, and working with health care providers. Peers are especially effective as leaders for self-management programs. As people who are themselves living with chronic conditions, they serve as excellent role models for participants. Moreover, peer leaders can more easily hold group sessions outside of normal working hours than can health care professionals, allowing more courses to be offered at a variety of times. Because even the most effective self-management programs require follow-up contact to sustain improvements in health behaviors,<sup>45</sup> peers can also maintain contact with program graduates to

continue to provide them with self-management support.

Many peer-led programs throughout the world follow a model that was first developed and evaluated by Lorig et al. at Stanford University (<http://patienteducation.stanford.edu>): the Chronic Disease Self-Management Program (CDSMP), or Tomando Control de Su Salud, the Spanish version. The CDSMP is a program for patients with different chronic conditions including diabetes given in 2.5-hour sessions once a week for 6 weeks. Its content includes design of individualized exercises and cognitive symptom management programs; methods for managing negative emotions such as anger, fear, depression, and frustration; and discussion of such topics as medications, diet, health care providers, and fatigue. Leaders teach the courses in an interactive manner designed to enhance participants' confidence in their ability to execute specific self-care tasks (self-efficacy).<sup>46</sup> In the model developed by Lorig et al., the goal is not to provide disease-specific content, but rather to use interactive exercises to build self-efficacy and other skills that will help participants better manage their chronic conditions and live fulfilling, active lives. A vital element is promoting exchange and discussion among participants and with the peer leaders.

The most successful diabetes-specific self-management group training classes that have been rigorously evaluated are based on empowerment theory. The role of the professional facilitating these group sessions is to work collaboratively with patients in support of their efforts to obtain knowledge and skills, attain self-selected goals, overcome barriers, and seek out appropriate care recommendations and support.<sup>44</sup> Rather than follow organized lesson plans delivering content in a prescribed manner and order, these programs encourage patients to apply newly acquired knowledge to their own lifestyles and to exchange information and experiences, enabling participants to learn from each other. Core empowerment model concepts include promoting patients' inherent drive toward wellness and encouraging informed choices and decision-making.<sup>44,47</sup> Several randomized, controlled trials have found improvements in glycaemic control, diabetes-specific qual-

ity of life, self-efficacy, and other patient-centered outcomes among participants in these group sessions compared to control groups.<sup>44</sup> Trial evidence also supports the effectiveness of these programs among low-income African-American and other ethnic minorities who have been found in focus group research to prefer more experiential learning with exchange of diabetes-related experiences among trusted peers to traditional lecture-based teaching from a health professional.<sup>47</sup>

To facilitate participants' ability to attend, these programs are often held in easily accessible community-based settings (e.g., churches or community organizations). Because many participants face barriers to attending frequent, face-to-face programs and even effective self-management programs require sustained follow-up to sustain benefits, it is important to discuss how the other peer support models described below may complement or extend these programs.

#### Peer Coaches

A more informal, flexible means of providing peer support for patients with diabetes and other chronic conditions comes from volunteer peer coaches or mentors. Peer coaches meet one-on-one with other patients to listen, discuss concerns, and provide support. Peer coaches are usually individuals who have successfully coped with the same condition or surgical procedure and can be positive role models and who usually receive from 8 to 32 hours of training. Training focuses on communication skills, including empathic listening, how to help participants clarify their values and life goals, problem solving, and assertiveness. Teaching the skills necessary to support patients is emphasized, rather than having the mentor try to assume the role of a health care provider.

Peer mentoring has been shown to be especially effective with nonwhite individuals who have a historic cultural mistrust of predominantly white health care systems.<sup>48</sup> No studies have rigorously evaluated the effectiveness of peer mentor programs for adults with diabetes. However, peer mentors have been shown to foster trust of the health care staff and enhance coping and health outcomes among patients with breast and prostate cancer, women with postpartum depres-

sion, and patients with HIV/AIDS.<sup>48</sup> Peer mentors have also been shown to improve self-care among heart failure patients.<sup>49</sup>

#### Community Health Workers

Community health workers, or promotoras, are community members who work as bridges between their ethnic, cultural, and geographical communities and health care providers to promote health, usually among groups that have traditionally lacked access to adequate health care. Community health workers do not always have diabetes, but they are peers to the populations they serve in other important respects: they often speak the language, share the culture, and come from the same communities as the patients with whom they work. Some populations, such as many recent immigrant groups, are more likely than others to turn to informal health care systems, and the community health worker model may fit these populations best. Community health workers have five often-overlapping roles in the treatment of diabetes. These include:

- Caring for and supporting patients by helping to identify resources, managing cases, reaching out to patients by telephone, and providing patients with disease-specific information
- Educating patients about self-care and helping them learn self-care skills
- Supporting the care and education provided by health care professionals
- Coordinating care and acting as a liaison with the health care system
- Providing social support by being available to listen and talk through problems that patients are experiencing<sup>50</sup>

Even with access to health care, there may be multiple individual and community barriers to adequate self-care of chronic diseases. People may lack transportation to attend regular clinic visits, have unstable work or home situations, or lack knowledge of available resources. Studies suggest that community health workers can help overcome these barriers by developing trusting, close relationships with the people they serve. Indeed, community health worker programs have improved health care access, prenatal care, pregnancy and birth outcomes, health status, and

health- and screening-related behaviors among participants in the programs.<sup>50</sup> Community health workers educate their peers, encourage them, and help them effectively use and navigate community and health resources. They improve the quality of life of the patients they serve and are particularly helpful in vulnerable populations, such as the elderly. There is also some evidence that community health care workers reduce health care costs.<sup>50</sup>

In the United States to date, the focus of community health workers has been on prevention, but there is increasing recognition that they can also help patients with chronic conditions. The Institute of Medicine recommends that health care systems support the use of community health workers to address racial and ethnic disparities in health care, stating that “community health workers offer promise as a community-based resource to increase racial and ethnic minorities’ access to health care and to serve as a liaison between health care providers and the communities they serve.”<sup>51</sup> A 2006 systematic review of community health worker programs serving adults with diabetes found that, in five of the seven studies reporting outcomes, patients who worked with a community health worker had more knowledge of their disease and better self-care skills (in areas such as diet, exercise, and blood glucose monitoring) than those patients who had no contact with a community health worker. Patients connected with community health workers had fewer emergency room visits.<sup>52</sup> This review also found improved provider monitoring of glycemic control and rates of retinopathy screening.<sup>52</sup>

Community health workers have also been successfully combined with nurse-led services. In one such program, African-American patients with diabetes who received the combined community health worker/nurse manager intervention had greater declines in hemoglobin A<sub>1c</sub> values, cholesterol levels, triglycerides, and diastolic blood pressure than did routine-care groups or those led solely by either community health workers or nurse case managers.<sup>53</sup>

### Telephone-Based Peer Support

To circumvent distance barriers, telephone outreach is an effective and

cost-efficient extension of clinic-based diabetes services and face-to-face self-management training and support.<sup>54</sup> Telephone-based care management allows for frequent patient contacts at a low cost and improves diabetes self-care and health outcomes.<sup>2,55–62</sup> Unfortunately, however, many health systems lack the nursing resources required to manage telephone care programs that rely exclusively on care manager outreach.

One promising approach to improve care for diabetes and other chronic diseases is to combine elements of peer-led self-management support and telephone-based care through telephone-based peer support. In these interventions, patients receive support through regular phone calls. Sometimes, a peer or peer counselor makes calls as the sole form of intervention. Other times, the telephone intervention complements another intervention. For example, participants in mutual support groups, self-management training classes, and group visits may exchange phone numbers and provide support between scheduled visits. In this way, telephone-based peer support can provide an important source of self-management support between face-to-face group visits, self-management training programs, or other clinic-based programs.

Telephone-based peer-helper interventions can be a satisfactory substitute for face-to-face peer interaction.<sup>63</sup> In fact, many people prefer the relative anonymity and increased privacy of talking on the telephone.<sup>49,64,65</sup> Telephone-based peer support interventions have led to improvements in chronic disease outcomes.<sup>63,64,66–68</sup>

The principal barriers to telephone-based peer support interventions have been participants’ reluctance to share telephone numbers and the cost of telephone calls, especially if partners are not in the same locality. Moreover, many patients may be willing to participate but lack the initiative or organization to ensure that contacts are made regularly. From a health system perspective, these initiatives can be difficult to monitor, and few, if any, have been designed to interface with standard outpatient nursing care.

One way to address these limitations is to use an interactive voice response (IVR) exchange platform with Internet monitoring. With this

technology, participants do not share phone numbers and can block calls during certain hours. The IVR system can generate automatic reminder calls to participants who have not contacted each other in a given period. IVR-facilitated telephone peer support may be an ideal adjunct to promote more effective use of standard nursing services and give patients additional help without requiring health systems to hire more workers. Such programs might also extend the reach of ongoing face-to-face self-management programs.

In an IVR system, participants dial a designated toll-free IVR number to contact their partners. When connected with the system, they enter their home phone number, which serves as an identification code linking them to their partner’s home phone. If, during the call, a question arises for a case manager or other staff member, voicemail messages can be left by pressing a designated key. A password-protected website can be used to monitor the calling process, including when calls are placed, who initiates them, and how long they last. If partners seem to have difficulty making contact, a staff person can contact them and address any problems. If participants wish to discontinue the program for any reason, they can ask a staff person to remove their telephone number from the system.

We have launched two large-scale randomized, controlled trials of IVR peer support programs. The first focuses on patients with diabetes on maximum doses of oral anti-hyperglycemic medications and poor glycemic control.<sup>69</sup> Many of the sources of patient resistance to initiating and intensifying insulin therapy lend themselves to peer support. Principal sources of resistance to starting insulin include fear of giving an injection, anxieties about proper techniques, and fear of hypoglycemia.<sup>70</sup> Moreover, insulin holds negative symbolism for many patients, representing treatment failure, social stigma, and advancing illness.<sup>71,72</sup> Many diabetes patients perceive insulin as the most burdensome diabetes treatment by far.<sup>72</sup> Yet, one recent study found that patients who had experience with insulin therapy rated the burden of insulin use significantly lower than those with no experience. This study reinforces other research dem-



onstrating that patients' experiential concerns may be best addressed with another person who also is coping with insulin management.<sup>72</sup>

In the diabetes intervention, we are evaluating a novel, low-cost intervention designed to address the informational and support needs of patients managing a change in their insulin. The intervention is offered through face-to-face group meetings facilitated by nurses and based on empowerment theory<sup>44</sup> and IVR-facilitated peer support. The program pairs patients who have similar disease severity and who face similar challenges. The peer matching is intended to be egalitarian, with both peers receiving and providing support, with no designation of one as helper and the other as help recipient. Although one of the key mechanisms by which peer support may work is to activate patients by having them help others (similar to how having someone teach something is the best way to get them to learn it well), this has not yet been rigorously tested in randomized, controlled trials.

Both patients in these peer matches receive some training in peer communication skills to support each other. At the initial nurse-led group session, facilitators trained in empowerment theory facilitate discussion among the group of diabetes patients about self-management challenges they are facing and help participants generate an initial short-term action plan of a specific behavioral step they will try during the next two weeks. Participants undergo initial training in empowerment theory-based peer communication skills and are encouraged to contact their partners weekly using a toll-free IVR phone system that protects their anonymity and provides automated call reminders. The IVR system further enables participants to leave asynchronous messages for each other and voicemail messages for the participating nurses during the peer conversations. Participants also receive a workbook to assist them and their partners in working together on their action plans. Finally, participants have the opportunity to participate in periodic group sessions (at 1, 3, and 6 months).

The pilot studies of these trials found high levels of participation in and satisfaction with the program.<sup>69,73</sup> All participants successfully completed the intervention and

had no technical difficulties with IVR-facilitated peer support phone calls. Most participants enjoyed talking with their peer partners and participated regularly in the calls. Ninety percent reported that they would be more satisfied with their health services if such a program were available. Participants reported that discussing mutual health concerns with a peer partner increased their motivation and confidence in caring for their own chronic conditions and that they found meaning and positive reinforcement in trying to support their partner's self-management efforts. The most successful matches in the pilot were between those who felt that they could both learn from and contribute to their partner's diabetes management because they had similar disease severity and challenges. The recently launched study will rigorously assess whether these promising pilot findings are borne out in a larger trial.

#### **Web- and E-mail-Based Peer Support**

Similar to telephone support, web- and e-mail-based support can overcome the problem some patients have with face-to-face contact. During the past decade, there has been significant growth in Internet-based support groups and other uses of the Internet to mobilize peer support. Internet-based interventions are promising because of their low cost and ease of dissemination, and they may provide alternatives to more labor- and resource-intensive clinic programs. Whereas traditional chronic disease support has been enhanced through face-to-face medical care, education programs, and support groups, Internet technology makes it possible to continue this tradition of supportive interaction in conjunction with information and education in a way that transcends the clinic environment.

Internet programs have been developed for diabetes education and self-management support, for delivering a behavioral weight-loss program, and for individuals at risk of type 2 diabetes.<sup>74-76</sup> Results of several recent randomized controlled trials suggest that adding peer support components (sometimes called "e-community" components) to Internet-based interventions can increase their effectiveness.<sup>77</sup> One successful program is the Internet discussion boards established

for patients and their family members by the Joslin Diabetes Center in 1998. These boards are a technological extension of traditional support groups providing people with diabetes a place to communicate with each other. For 74 months, from 1998 to 2004, Zrebiec<sup>78</sup> tracked the activity and characteristics of user visits to the site and conducted a survey of user satisfaction. Of 791 respondents, 74% rated participation in the discussion board as having a positive effect on coping with diabetes, and 71% rated participation as helping them to feel "more hopeful" or "a lot more hopeful" about coping with diabetes.

In another recent intervention, Lorig et al.<sup>79</sup> developed an Internet version of their CDSMP with content similar to the face-to-face program. Two trained peer moderators take part in each workshop and help participants by reminding them to log on, modeling action planning and problem solving, offering encouragement, and posting to the bulletin boards. Lorig et al. recently completed a randomized, controlled evaluation of the program among participants with diabetes, heart disease, or chronic lung disease.<sup>79</sup> After 12 months, participants had significantly improved levels of health distress, fatigue, pain, and shortness of breath. Increases in self-efficacy at 6 months were significantly associated with improved levels of pain, shortness of breath, fatigue, disability, illness intrusiveness, health distress, and global general health. Improvements in the online group were similar to those achieved in the face-to-face groups.

#### **Conclusion**

A crucial issue for many patients with diabetes is accessing sufficient support on a regular basis for effective diabetes self-management. In the face of growing numbers of older adults with chronic illnesses such as diabetes and significant resource constraints facing health systems, it is increasingly important to develop and evaluate low-cost interventions that build on available resources and can empower patients to provide greater mutual assistance. In particular, novel strategies are needed to increase between-visit support via community-based programs, telephone-based programs, and programs using new communication technologies for the large num-

bers of patients with limited health literacy.

Peer support models are a potentially low-cost, flexible means to supplement formal health care support. Peer support models also potentially benefit both those receiving and those providing support. Reciprocal models for both receiving and providing peer support are being rigorously evaluated. The unifying feature of these programs is that they seek to build on the strengths, knowledge, and experience that peers can offer. Peer support interventions build on the recognition that people living with chronic illnesses have a great deal to offer each other; they share knowledge and experience that others, including many health care professionals, cannot understand. If carefully designed and implemented, peer support interventions can be a powerful way to help patients with chronic diseases live more successfully with their conditions.

There is still much to learn about how best to organize and deliver effective programs, which types of programs are best for different types of patients, and how best to integrate peer support interventions into other clinical and outreach services. Many of the models discussed in this brief overview have not yet been rigorously evaluated in randomized, controlled trials or have only been evaluated in one or two studies. There is much to be done in testing different peer support models and building knowledge to inform the development of improved models of peer support for diabetes self-management.

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## References

<sup>1</sup>Gallant MP: The influence of social support on chronic illness self-management: a review and directions for research. *Health Ed Behav* 30:170-195, 2003

<sup>2</sup>Aubert RE, Herman WH, Waters J, Moore W, Sutton S: 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

<sup>3</sup>Phillips CO, Wright SM, Kern DE, Singa RM, Shepperd S, Rubin HR: Comprehensive discharge planning with postdischarge support for older patients with congestive heart failure: a meta-analysis. *JAMA* 291:1358-1367, 2004

<sup>4</sup>Lloyd CE, Wing RR, Orchard TJ, Becker DJ: Psychosocial correlates of glycemic control: the Pittsburgh Epidemiology of Diabetes Complications (EDC) Study. *Diabetes Res Clin Pract* 21:187-195, 1993

<sup>5</sup>Glasgow RE, Toobert DJ: Social environment and regimen adherence among type II diabetic patients. *Diabetes Care* 11:377-386, 1988

<sup>6</sup>Ruggiero L, Spirito A, Bond A, Coustan D, McGarvey S: Impact of social support and stress on compliance in women with gestational diabetes. *Diabetes Care* 13:441-443, 1990

<sup>7</sup>Tillotson LM, Smith MS: Locus of control, social support, and adherence to the diabetes regimen. *Diabetes Educ* 22:133-139, 1996

<sup>8</sup>Kulik JA, Mahler HI: Emotional support as a moderator of adjustment and compliance after coronary artery bypass surgery: a longitudinal study. *J Behav Med* 16:45-63, 1993

<sup>9</sup>Musick MA, Wilson J: Volunteering and depression: the role of psychological and social resources in different age groups. *Soc Sci Med* 56:259-269, 2003

<sup>10</sup>Krause N, Herzog AR, Baker E: Providing support to others and well-being in later life. *J Gerontol* 47:P300-P311, 1992

<sup>11</sup>Wheeler JA, Gorey KM, Greenblatt B: The beneficial effects of volunteering for older volunteers and the people they serve: a meta-analysis. *Int J Aging Hum Dev* 47:69-79, 1998

<sup>12</sup>Van Willigen M: Differential benefits of volunteering across the life course. *J Gerontol B Psychol Sci Soc Sci* 55:S308-S318, 2000

<sup>13</sup>West DA, Kellner R, Moore-West M: The effects of loneliness: a review of the literature. *Compr Psychiatr* 27:351-363, 1986

<sup>14</sup>Schwartz CE, Sendor M: Helping others helps oneself: response shift effects in peer support. *Soc Sci Med* 48:1563-1575, 1999

<sup>15</sup>Musick MA, Herzog AR, House JS: Volunteering and mortality among older adults: findings from a national sample. *J Gerontol B Psychol Sci Soc Sci* 54:S173-S180, 1999

<sup>16</sup>Brown SL, Nesse RM, Vinokur AD, Smith DM: Providing social support may be more beneficial than receiving it: results from a prospective study of mortality. *Psychol Sci* 14:320-327, 2003

<sup>17</sup>Davis C, Leveille S, Favaro S, LoGerfo M: Benefits to volunteers in a community-based health promotion and chronic illness self-management program for the elderly. *J Gerontol Nurs* 24:16-23, 1998

<sup>18</sup>Arnstein P, Vidal M, Wells-Federman C, Morgan B, Caudill M: From chronic pain patient to peer: benefits and risks of volunteering. *Pain Manag Nurs* 3:94-103, 2002

<sup>19</sup>Malchodi CS, Oncken C, Dornelas EA, Carmanica L, Gregonis E, Curry SL: The effects of peer counseling on smoking cessation and reduction. *Obstet Gynecol* 101:504-510, 2003

<sup>20</sup>Dennis CL: Peer support within a health care context: a concept analysis. *Int J Nurs Stud* 40:321-332, 2003

<sup>21</sup>Winzelberg AJ, Classen C, Alpers GW, Roberts H, Koopman C, Adams RE, Ernst H, Dev P, Taylor CB: Evaluation of an Internet support group for women with primary breast cancer. *Cancer* 97:1164-1173, 2003

<sup>22</sup>Joseph DH, Griffin M, Hall RE, Sullivan ED: Peer coaching: an intervention for individuals struggling with diabetes. *Diabetes Educ* 27:703-710, 2001

<sup>23</sup>Wilson W, Pratt C: The impact of diabetes education and peer support upon weight and glycemic control of elderly persons with non-insulin dependent diabetes mellitus (NIDDM). *Am J Public Health* 77:634-635, 1987

<sup>24</sup>Keyserling TC, Ammerman AS, Samuel-Hodge CD, Ingram AF, Skelly AH, Elasy T: A diabetes management program for African American women with type 2 diabetes. *Diabetes Educ* 26:796-805, 2000

<sup>25</sup>Keyserling TC, Samuel-Hodge CD, Ammerman AS, Ainsworth BE, Henriquez-Roldan CF, Elasy TA, Skelly AH, Johnston CF, Bangdiwala S: A randomized trial of an intervention to improve self-care behaviors of African-American women with type 2 diabetes: impact on physical activity. *Diabetes Care* 25:1576-1583, 2002

<sup>26</sup>Kownacki RJ, Shadish WR: Does Alcoholics Anonymous work? The results from a meta-analysis of controlled experiments. *Subst Use Misuse* 34:1897-1916, 1999

<sup>27</sup>Spitzer RL, Kroenke K, Williams JB: Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. Primary Care Evaluation of Mental Disorders. Patient Health Questionnaire. *JAMA* 282:1737-1744, 1999

<sup>28</sup>Sharpe L, Sensky T, Timberlake N, Ryan B, Brewin CR, Allard S: A blind, randomized, controlled trial of cognitive-behavioural intervention for patients with recent onset rheumatoid arthritis: preventing psychological and physical morbidity. *Pain* 89:275-283, 2001

<sup>29</sup>Kroenke K, Swindle R: Cognitive-behavioral therapy for somatization and symptom syndromes: a critical review of controlled clinical trials. *Psychother Psychosom* 69:205-215, 2000

<sup>30</sup>Gilden JL, Hendryx MS, Clar S, Casia C, Singh SP: Diabetes support groups improve health care of older diabetic patients. *J Am Geriatr Soc* 40:147-150, 1992

<sup>31</sup>Broadhead RS, Heckathorn DD, Altice FL, VanHulst Y, Carbone M, Friedland GH, O'Connor PG, Selwyn PA: Increasing drug users' adherence to HIV treatment: results of a peer-driven intervention feasibility study. *Soc Sci Med* 55:235-246, 2002

<sup>32</sup>Matthews BA, Baker F, Hann DM, Denniston M, Smith TG: Health status and life satisfaction among breast cancer survivor peer support volunteers. *Psycho-Oncol* 11:199-211, 2002

- <sup>33</sup>Helgeson VS, Cohen S, Schulz R, Yasko J: Group support interventions for women with breast cancer: who benefits from what? *Health Psychol* 19:107–114, 2000
- <sup>34</sup>Lorig KR, Ritter P, Stewart AL, Sobel DS, Brown BW, Bandura A, Gozalez VM: Chronic disease self-management program: 2-year health status and health care utilization outcomes. *Med Care* 39:1217–1223, 2001
- <sup>35</sup>Lorig KR, Sobel DS, Ritter PL, Laurent D, Hobbs M: Effect of a self-management program on patients with chronic disease. *Effect Clin Pract* 4:256–262, 2001
- <sup>36</sup>Beck A, Scott J, Williams P, Robertson D: A randomized trial of group outpatient visits for chronically ill older HMO members: the Cooperative Health Care Clinic. *J Am Geriatr Soc* 45:543–549, 1997
- <sup>37</sup>Snoek FJ, van der Ven NC, Lubach CH, Chatrou M, Ader HF, Heine RJ, Jacobson AM: Effects of cognitive behavioural group training (CBGT) in adult patients with poorly controlled insulin-dependent (type 1) diabetes: a pilot study. *Patient Educ Couns* 45:143–148, 2001
- <sup>38</sup>Scott J, Gade G, McKenzie M, Venohr I: Cooperative health care clinics: a group approach to individual care. *Geriatrics* 53:68–70, 76–78, 81; quiz 82, 1998
- <sup>39</sup>Escobar GJ, Braveman PA, Ackerson L, Odouli R, Coleman-Phox K, Capra AM, Wong C, Lieu TA: A randomized comparison of home visits and hospital-based group follow-up visits after early postpartum discharge. *Pediatrics* 108:719–727, 2001
- <sup>40</sup>Coleman EA, Grothaus LC, Sandhu N, Wagner EH: Chronic care clinics: a randomized controlled trial of a new model of primary care for frail older adults. *J Am Geriatr Soc* 47:775–783, 1999
- <sup>41</sup>Von Korff M, Moore JE, Lorig K, Cherkin K, Saunders K, Gonzalez VM, Laurent D, Rutter C, Comite F: A randomized trial of a lay person-led self-management group intervention for back pain patients in primary care. *Spine* 23:2608–2615, 1998
- <sup>42</sup>Wagner EH, Grothaus LC, Sandhu N, Galvin N, McGregor M, Artz K, Coleman EA: Chronic care clinics for diabetes in primary care: a system-wide randomized trial. *Diabetes Care* 24:695–700, 2001
- <sup>43</sup>Tang TS, Gillard ML, Funnell MM, Nwanko R, Parker E, Spurlock D, Anderson RM: Developing a new generation of ongoing: diabetes self-management support interventions: a preliminary report. *Diabetes Educ* 31:91–97, 2005
- <sup>44</sup>Anderson RM, Funnell MM, Butler PM, Arnold MS, Fitzgerald JT, Feste CC: Patient empowerment: results of a randomized controlled trial. *Diabetes Care* 18:943–949, 1995
- <sup>45</sup>Norris SL, Lau J, Smith SJ, Schmid CH, Engelgau MM: Self-management education for adults with type 2 diabetes: a meta-analysis of the effect on glycemic control. *Diabetes Care* 25:1159–1171, 2002
- <sup>46</sup>Bandura A: *Self-efficacy: the Exercise of Control*. New York, W.H. Freeman, 1997
- <sup>47</sup>Funnell MM, Anderson RM, Arnold MS, Barr PA, Donnelly M, Johnson PD, Taylor-Moon D, White NH: Empowerment: an idea whose time has come in diabetes education. *Diabetes Educ* 17:37–41, 1991
- <sup>48</sup>Perry E, Swartz J, Brown S, Smith D, Kelly G, Swartz R: Peer mentoring: a culturally sensitive approach to end-of-life planning for long-term dialysis patients. *Am J Kidney Dis* 46:111–119, 2005
- <sup>49</sup>Riegel B, Carlson B: Is individual peer support a promising intervention for persons with heart failure? *J Cardiovasc Nurs* 19:174–183, 2004
- <sup>50</sup>Lewin SA, Dick J, Pond P, Zwarenstein M, Aja G, Van Wyk B, Bosch-Capblanch X, Patrick M: Lay health workers in primary and community health care [Review]. *Cochrane Database Syst Rev* CD004015, 2005
- <sup>51</sup>Smedley BD, Stith AY, Nelson AR, Institute of Medicine Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care: *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Washington, D.C., National Academy Press, 2002
- <sup>52</sup>Norris SL, Chowdhury FM, Van Le K, Horsley T, Brownstein JN, Zhang X, Jack L, Satterfield D: Effectiveness of community health workers in the care of persons with diabetes. *Diabet Med* 23:544–556, 2006
- <sup>53</sup>Gary TL, Bone LR, Hill MN, Levine DM, McGuire M, Saudek C, Brancati FL: Randomized controlled trial of the effects of nurse case manager and community health worker interventions on risk factors for diabetes-related complications in urban African Americans. *Prev Med* 37:23–32, 2003
- <sup>54</sup>Hooper GS, Yellowlees P, Marwick TH, Currie PJ, Bidstrup BP: Telehealth and the diagnosis and management of cardiac disease. *J Telemed Telecare* 7:249–256, 2001
- <sup>55</sup>Piette JD: Satisfaction with automated telephone disease management calls and its relationship to their use. *Diabetes Educ* 26:1003–1010, 2000
- <sup>56</sup>Piette JD, Weinberger M, McPhee SJ, Mah CA, Kraemer FB, Crapo LM: Do automated calls with nurse follow-up improve self-care and glycemic control among vulnerable patients with diabetes? *Am J Med* 108:20–27, 2000
- <sup>57</sup>Piette JD, Mah CA: The feasibility of automated voice messaging as an adjunct to diabetes outpatient care. *Diabetes Care* 20:15–21, 1997
- <sup>58</sup>Weinberger M, Kirkman MS, Samsa GP, Shortliffe CA, 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
- <sup>59</sup>Wasson J, Gaudette C, Whaley F, Sauvigne A, Baribeau P, Welch HG: Telephone care as a substitute for routine clinic follow-up. *JAMA* 267:1788–1793, 1992
- <sup>60</sup>DeBusk RF, Miller NH, Superko HR, Dennis CA: A case-management system for coronary risk factor modification after acute myocardial infarction. *Ann Intern Med* 120:721–729, 1994
- <sup>61</sup>Piette JD, McPhee SJ, Weinberger M, Mah CA, Kraemer FB: Use of automated telephone disease management calls in an ethnically diverse sample of low-income patients with diabetes. *Diabetes Care* 22:1302–1309, 1999
- <sup>62</sup>Piette JD, Weinberger M, McPhee SJ: Do automated calls with nurse followup improve self-care and glycemic control among vulnerable patients with diabetes? *Am J Man Care* 108:20–27, 2000
- <sup>63</sup>Rudy RR, Rosenfeld LB, Galassi JP, Parker J, Schanberg R: Participants' perceptions of a peer-helper, telephone-based social support intervention for melanoma patients. *Health Commun* 13:285–305, 2001
- <sup>64</sup>Colon Y: Telephone support groups: a non-traditional approach to reaching underserved cancer patients. *Cancer Pract* 4:156–159, 1996
- <sup>65</sup>Mermelstein HT, Holland JC: Psychotherapy by telephone: a therapeutic tool for cancer patients. *Psychosomatics* 32:407–412, 1991
- <sup>66</sup>Rene J, Weinberger M, Mazzuca SA, Brandt KD, Katz BP: Reduction of joint pain in patients with knee osteoarthritis who have received monthly telephone calls from lay personnel and whose medical treatment regimens have remained stable. *Arthritis Rheum* 35:511–515, 1992
- <sup>67</sup>Stewart MJ, Hart G, Mann K, Jackson S, Langille L, Reidy M: Telephone support group intervention for persons with hemophilia and HIV/AIDS and family caregivers. *Int J Nurs Stud* 38:209–225, 2001
- <sup>68</sup>Curran VR, Church JG: A study of rural women's satisfaction with a breast cancer self-help network. *J Telemed Telecare* 5:47–54, 1999
- <sup>69</sup>Heisler M, Piette J: "I help you, and you help me": facilitated telephone peer support among patients with diabetes. *Diabetes Educ* 31:869–879, 2005
- <sup>70</sup>Korytkowski M: When oral agents fail: practical barriers to starting insulin. *Int J Obes Relat Metab Disord* 26 (Suppl. 3):S18–S24, 2002
- <sup>71</sup>Hunt LM, Valenzuela MA, Pugh JA: NIDDM patients' fears and hopes about insulin therapy: the basis of patient reluctance. *Diabetes Care* 20:292–298, 1997
- <sup>72</sup>Rubin RR, Peyrot M: Psychological issues and treatments for people with diabetes. *J Clin Psychol* 57:457–478, 2001
- <sup>73</sup>Heisler M, Halasyamani L, Resnicow K, Neaton M, Shanahan J, Brown S, Piette JD: "I am not alone": the feasibility and acceptability of interactive voice response (IVR)-facilitated telephone peer support among older adults with heart failure (HF). *Congest Heart Fail* 2007. In press
- <sup>74</sup>Stewart MJ, Reutter L: Fostering partnerships between peers and professionals. *Can J Nurs Res* 33:97–116, 2001
- <sup>75</sup>McKay HG, Glasgow RE, Feil EG, Boles SM, Barrera M Jr: Internet-based diabetes self-management and support: initial outcomes from the diabetes network project. *Rehabil Psychol* 47:31–48, 2002
- <sup>76</sup>Glasgow RE, Boles SM, McKay HG, Feil EG, Barrera M Jr: The D-Net Diabetes Self-



Management Program: long-term implementation, outcomes, and generalization results. *Prev Med* 36:410–419, 2003

<sup>77</sup>Tate DF, Jackvony EH, Wing RR: Effects of Internet behavioral counseling on weight loss in adults at risk for type 2 diabetes: a randomized trial. *JAMA* 289:1833–1836, 2003

<sup>78</sup>Zrebiec JF: Internet communities: do they improve coping with diabetes? *Diabetes Educ*

31:825–828, 830–832, 834, 836, 2005

<sup>79</sup>Lorig KR, Ritter PL, Laurent DD, Plant K: Internet-based chronic disease self-management: a randomized trial. *Med Care* 44:964–971, 2006

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*Michele Heisler, MD, MPA, is a research scientist at the Veterans*

*Affairs Center for Clinical Practice Management Research, VA Ann Arbor Healthcare System, and an assistant professor in the Department of Internal Medicine at the University of Michigan Medical School in Ann Arbor.*