

# Twenty-First Century Behavioral Medicine: A Context for Empowering Clinicians and Patients With Diabetes

A consensus report

DAVID G. MARRERO, PHD<sup>1</sup>  
 JAMY ARD, MD<sup>2</sup>  
 ALAN M. DELAMATER, PHD<sup>3</sup>  
 VIRGINIA PERAGALLO-DITTKO, RN<sup>4</sup>

ELIZABETH J. MAYER-DAVIS, MSPH, PHD, RD<sup>5</sup>  
 ROBIN NWANKWO, RD, MPH, CDE<sup>6</sup>  
 EDWIN B. FISHER, PHD<sup>7</sup>

In the past decades, the sophistication of treatments for diabetes has increased dramatically, and evidence for effective interventions has proliferated. As a result, it is now possible to achieve excellent glucose control and reduce the risk of many of the complications associated with the disease. Despite these advances, however, many people with diabetes have less than optimal metabolic control and continue to suffer from preventable complications. The gap between optimal evidence-based medicine and actual practice can be great, dependent not only on the ability of the clinician to make changes in practice patterns but also on the central role of the patient in implementing optimal management plans in daily life. With recognition of the centrality of patients' actions to achieve optimal outcomes must come awareness that those actions reflect much more than simple "self-control." In addition to individual characteristics, the environment in which behaviors are enacted has great influence, from family eating patterns to the design of neighborhoods to workplace and national health policies. For patients and clinicians, these factors create the

context or environment in which behaviors are enacted.

Diabetes provides a prime example of this fundamental interaction of individual characteristics with the ecological or contextual factors. For example, Pima Indians living in the U.S. have the highest prevalence of type 2 diabetes of any population in the world, yet Pimas living traditional lifestyles in Mexico have relatively low levels of diabetes. Ample evidence links genetics to diabetes within the Pima population, but exposure to an obesogenic environment is critical to expression of this very strong genetic propensity (1).

This interplay between the individual and the context in which he or she behaves is commonly cited in discussions of personal health choices and health and social policies. These perspectives have shifted in important ways over the past few decades. Previously, we thought that simply providing information would change health care and health behaviors. It was widely held that all that was necessary to change clinical practice was to inform doctors of the reasons or research behind recommendations and that

changing individual health behavior was a simple matter of explaining the importance of performing specific actions. In the later decades of the twentieth century, this view of clinicians and patients as obedient adopters of facts and recommendations was replaced by two somewhat divergent viewpoints: those emphasizing characteristics of the individual versus those emphasizing the role of the broader contexts of economics, communities, organizations, cultures, and policies. This report will examine each of these in turn, before considering the synthesis of individual and context in a twenty-first century perspective of multilevel, multichannel influences. This consideration will include implications and lessons for clinical practice and development of improved approaches to promoting engagement in diabetes care, effective diabetes self-management, and quality of life among those with the disease.

**The individual perspective**—Diabetes exemplifies as much as any chronic disease the extent to which individuals' behaviors influence outcomes. The behaviors of the individual—diet, energy expenditure, medication taking—have a direct impact on the fundamental disease process of energy metabolism. Thus, it is fundamental that behavior and biology, medical treatment and patient actions will interact to guide the course of the disease.

This is reflected in the development of what is considered standard of care in diabetes: self-management education that includes group and/or individual sessions educating patients as to the nature of diabetes and its management, setting specific behavioral objectives for improved management, teaching skills for achieving those objectives, and supporting an iterative process of attempting new self-management practices, monitoring their success, revising plans, and attempting revised plans (2,3). Application of this general model has been shown to improve

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 From the <sup>1</sup>Department of Medicine, Indiana University School of Medicine, Indianapolis, Indiana; the <sup>2</sup>Department of Epidemiology and Prevention, Wake Forest University, Winston-Salem, North Carolina; the <sup>3</sup>Department of Pediatrics, University of Miami, Miami, Florida; the <sup>4</sup>Diabetes and Obesity Institute, Winthrop University Hospital, Mineola, New York; the <sup>5</sup>Department of Nutrition and Department of Medicine, University of North Carolina, Chapel Hill, North Carolina; the <sup>6</sup>Department of Medical Education, University of Michigan, Ann Arbor, Michigan; and <sup>7</sup>Peers for Progress, American Academy of Family Physicians Foundation, and the Departments of Health Behavior and Psychology, University of North Carolina, Chapel Hill, North Carolina.

Corresponding author: David G. Marrero, [dgmarrero@iupui.edu](mailto:dgmarrero@iupui.edu).

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D.G.M. is the Writing Group Chair.

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both self-management behaviors and metabolic control (4–6).

### Compliance, adherence, and empowerment

The focus on the importance of the individual has been accompanied by changes in the view of the patient's role in diabetes care. "Compliance" was seen as "the extent to which a person's behavior coincides with medical advice" (7). "Noncompliance" was often attributed to personal qualities of patients, such as denial, lack of will power or discipline, or willful decisions not to follow the clinician's recommendations. In the 1980s, work on self-management (8) stressed the agency of the individual, and the term "compliance" was replaced by "adherence." This may seem a superficial change, but "adherence" was intended to emphasize the "active, voluntary, and collaborative involvement of the patient in a mutually acceptable course of behavior to produce a therapeutic result" (9).

The term "adherence" has itself been criticized because of its implication of a dictated treatment plan to which the patient is expected to adhere, rather than a focus on the active role of the patient in making daily decisions and guiding their diabetes management (10). Moving beyond a presumed single path to which to adhere, "patient empowerment" seeks a collaborative approach to helping patients make sense of their disease, develop personal goals for its management, and make daily decisions in tuning their management to current circumstances (11).

Key among the principles of empowerment is that the majority of diabetes care is implemented by the individual with the disease, and, in this context, the role of the health care team is to support the patient/decision maker through ongoing diabetes expertise, education, and psychosocial support. Additionally, empowerment emphasizes the importance of objectives being personally meaningful and freely chosen, the uniqueness of each individual's situation so that approaches are tailored, and the capacity of all people to make choices that enhance the quality of their lives (11).

Although truly comprehensive care in many cases will need a redesigned care system, there are elements that can be meaningfully implemented in almost any existing system of care. These start with how we approach establishing therapeutic goals with our patients (Table 1).

Central to empowerment is a less hierarchical relationship between clinician

and patient and a collaborative approach to goal setting. Patients' reports of shared decision making are associated with agreement in selecting treatment goals and strategies and improved patient assessment of their own self-management and self-efficacy, suggesting the importance of shared decision making to patients' engagement in their diabetes care (12). Of growing interest is the possibility that technology may enhance empowerment, such as through computerized individual assessment to support efficient goal setting and attention to patient-selected goals (13).

Specific approaches to collaborative goal setting include selection of goals or objectives according to individuals' perception of their ability to actually achieve them (i.e., self-efficacy) (3). Motivational interviewing is an intervention to address the ambivalence that individuals may have about behavior change and to resolve discrepancies between their values or goals and their behaviors. Motivational interviewing, which has been shown to improve glucose control in adults (14) and in adolescents (15) and to enhance weight loss (16), differs from more "coercive" or externally driven methods for motivating change. It does not try to impose change that may be inconsistent with the person's own values, beliefs, or wishes, but rather supports change in a manner congruent with the person's own values and concerns. Interventions to increase intrinsic motivation for self-management improve glycemic control, expand perceived competence in managing diabetes, and increase self-management behaviors such as glucose monitoring (17).

### Negative emotion and healthy coping

Psychological problems that are more prevalent in persons with diabetes, such as anxiety, depression, and eating disorders, are associated with lower levels of self-management behaviors in both youths and adults (18). Many persons with diabetes experience a variety of psychological problems or distress, and this distress may interfere with diabetes management. Although health care providers recognize that psychological problems adversely affect adherence, many do not feel confident in their ability to identify psychological problems in their patients or to intervene effectively with them (19).

Research on healthy coping, one of the AADE7 Self-Care Behaviors, has identified benefits of a variety of interventions. Self-management education and other

approaches to improving general diabetes care tend to improve quality of life and emotional status. A wide range of intervention approaches, including problem solving therapy (20), cognitive behavioral and related psychotherapeutic approaches, family approaches, and group interventions have been shown to improve emotional status among those with diabetes (21) and among those with both clinical depression and diabetes (22).

### Clinicians

Just as the patient's experience with diabetes is shaped by individual characteristics, so is that of the clinician who delivers diabetes care. Clinician behavior is not just the reflection of static characteristics of the professional, but it also reflects the clinician's skills and active engagement with new developments of diabetes management. For example, clinicians who pursue a shared decision-making approach with patients achieve improved outcomes (23). Other ways in which the individual clinician can learn to be more effective in changing patient behaviors include improved interviewing and counseling skills. Findings regarding the influence of the clinician's interactions with the patient during the medical encounter on chronic disease management and metabolic control (24,25) led to studies examining how these might be enhanced (26).

**Context**—Complementary to research emphasizing the roles of individuals (both patients and clinicians) is evidence articulating the role of social and other contexts surrounding the individual (27). A framework for understanding how a range of broad contextual factors influences individuals and their behaviors is the ecological model (28), as schematized in Fig. 1. In this model, the individual (both psychological and biological aspects) operates within the context of family, friends, and small groups, which are, in turn, embedded within several layers of larger social contexts.

Just as people influence their families and are influenced by them, families influence communities and vice versa, and so on among governments, cultures, and overall society. Thus, an important principle of the ecological model is that factors at different levels influence each other, and these interlevel influences are often reciprocal.

At the individual level, studies have shown that social isolation (e.g., lacking someone with whom to discuss personal matters or to call on for a favor) has effects

**Table 1—Recommendations for health care providers**

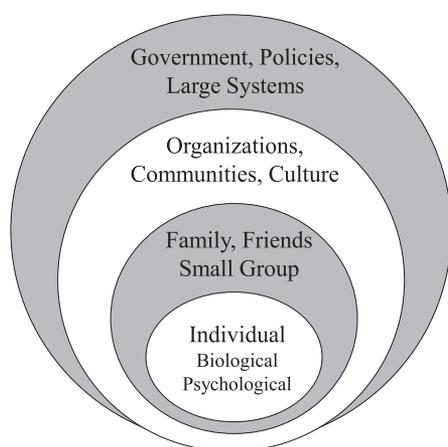
Frame collaborative goal setting in a full, shared understanding of the patient's clinical status including comorbidities, culture and values, family, and social and community environment.	A collaborative care model emphasizes that clinicians help their patients to set goals and provide ongoing support for optimal patient self-management behaviors over time (1,2). It is important to mutually establish what goals of therapy are realistic for a given individual, accounting for his or her personal, contextual situation. Patients and health care clinicians cannot collaboratively develop individualized behavior change goals without first considering the context in which patients respond to their environment. For example, a patient whose health plan provides membership to a local fitness center may not be burdened by the cost or lack of access to fitness programs, but goal-setting considerations may include other exercise-related barriers such as long work hours, lack of child care, or fatigue.
Be open-minded to patient choices, even if they are not what you consider to be best practice.	Small interventions, if consistently done, can have a significant impact. For example, patients who initially resist changing from sweetened to unsweetened beverages might begin the transition with a goal to reduce sweetened beverage consumption by one serving a day. Drawing hard lines is likely to result in a decrease in communication about behaviors that may negatively impact therapeutic outcomes.
Ensure that the patient receives adequate training and support to encourage self-management.	Take time to learn about your local resources and clearly explain to patients why self-management education and support will help them. The following websites list diabetes self-management education programs that meet the National Standards for Diabetes Self-Management Education and Support: American Diabetes Association Education Recognition Program at <a href="http://www.diabetes.org/findaprogram">www.diabetes.org/findaprogram</a> and American Association of Diabetes Educators Diabetes Education Accreditation Program at <a href="http://www.diabeteseducator.org">www.diabeteseducator.org</a> .
Encourage participation in community programs.	Peer groups help patients adapt workable solutions in an atmosphere of mutual support. Some patients feel more comfortable sharing their experiences in the anonymous setting of internet chat rooms and support groups. Lay health coaches often have considerable training providing culturally relevant support.
Review laboratory and biometric data with the patient as part of goal setting and support.	In particular, patients should know their A1C, BMI, blood pressure, lipid levels, the target values, and the management options for reaching the target values. For example, after discussing why it is important to monitor and improve lipid levels as part of diabetes treatment, the clinician and patient may map out a plan to improve lipid levels that may include medication, food-related and/or exercise changes. By setting realistic expectations for the next visit, the patient will view laboratory tests as feedback instead of judgment.
Take stock and renew or revise the plan at each visit.	A well-intentioned goal to walk for exercise may need to be reevaluated because of the ice in winter or high humidity of summer. Achieving a small, initial goal can signal the next incremental step. Likewise, self-determined goals may need to be revised in the context of depression, mourning, or even unemployment.
Recognize that the behaviors involved in managing or preventing diabetes are dynamic and multidimensional.	Patients may be able to follow one aspect of the treatment plan but not others. For example, the same patient who never misses a dose of a medication seen as beneficial may not modify food choices or keep health care appointments. Diabetes care requires a truly collaborative approach where patients and clinicians relate as equals. The choices affecting the health and well-being of a person with diabetes are ultimately made by that person in the context of his or her daily life. As long as the individual has been fully supported, the consequences of these choices belong to the person as well (11).

on mortality comparable to those of cigarette smoking (29). Socioeconomic influences are observed at the individual level, as low socioeconomic status, low educational level, and ethnic minority status (often confounded by lower

socioeconomic status and education) are associated with lower levels of treatment plan adherence and greater diabetes-related morbidity (30).

Among the higher levels of the ecological model are what has come to be

called the “social determinants” of health. At the level of the community, the likelihood of obesity is 1.45 times greater in neighborhoods with only convenience stores than in neighborhoods that contain supermarkets, after controlling for sex,



**Figure 1**—Ecological model of health behavior. Adapted from Fisher et al. *Behavioral science research in the prevention of diabetes: status and opportunities*. *Diabetes Care* 2002;25:599–606.

race, age, income, education, and physical activity (31). Similar relationships have been found for varied health indicators linked with neighborhood design, such as walkability and access to recreational and health facilities (32,33). That neighborhood environments may be causally related to health outcomes was demonstrated by a randomized trial of housing vouchers for women living in low-income neighborhoods. Compared with women given standard vouchers, those randomized to receiving housing vouchers that could only be used to move to higher income neighborhoods had lower rates of severe obesity and hyperglycemia a decade later (34). At the level of policies, states' school policies affecting food services and nutrition are significantly associated with prevalence of obesity among youth even after controlling for state-level measures of ethnicity and income (35). In one study among developed countries, income inequality was highly correlated with each country's diabetes-related mortality (36).

Of course, organizational contexts and systems also influence clinicians' behavior. Reimbursement policies limit the time for face-to-face encounters, may not support interventions by members of the team other than physicians, and provide strong disincentives for diabetes management support interventions outside the walls of the clinic. Thus, from the ecological perspective, adoption of key behaviors by both clinicians and patients is driven by a complex of organizational, social network, and other influences surrounding them (28). In this regard,

therapeutic decisions need to consider how context will influence their adoption.

### Ongoing support for diabetes management

A topic that links a focus on the individual with the importance of the individual's context is the facilitation and encouragement of the 24/7 ongoing diabetes management that must take place in homes, families, neighborhoods, workplaces, and organizations outside of the health care arena. The effects of patient education alone generally wane after about 6 months so that individuals need diabetes self-management support following self-management education to continue to implement and sustain the behaviors needed to manage their illness in the context of their lives (37). As long ago as 1968, early leaders in behavior modification urged that maintenance of behavior change "should be programmed rather than wished for or lamented" (38). However, in spite of the evidence pointing to the need for ongoing support, most research addresses initiating behavior change, not sustaining it. For example, a search of PubMed (10 September 2012) for articles with "diabetes" (or "diabetic") and "self-management" in their titles or abstracts yielded 1,952 responses. A subsequent search with these terms and cognates of "sustain" or "maintenance" yielded only 248, or 13% as many.

In 2012, the National Standards for Diabetes Self-Management Education and Support were not only renamed to reinforce the importance of support but were strengthened to position support as a key element of self-management (37). There are proven feasible approaches to providing ongoing follow-up and support, including nurse follow-up by telephone (39,40) as well as through community health workers with various skill levels (41,42).

In spite of guidelines encouraging ongoing support and feasible models for implementation, follow-up and support are aspects of self-management that are least frequently provided (43). Medicare's initial diabetes self-management training benefit includes 10 h of group diabetes self-management education plus an additional hour for insulin administration education by a recognized/accredited provider. The initial medical nutrition therapy benefit includes 3 h of group or individual medical nutrition therapy by a certified provider. Follow-up services are limited

to 4 h of contact and support per year (2 h of diabetes self-management education, 2 h of medical nutrition therapy), unless there is a change in therapy (44). A recent study of Medicare, Medicaid, and private insurance found that, with the exception of on-demand features such as nurse answering lines, coverage of support for self-management was minimal (45).

### Social influences

A prime example of the study of contexts has been in the roles of families of children and youth with type 1 diabetes (46). This has led to interventions that encourage effective attention by the family to a member's type 1 diabetes, shown to result in improved clinical as well as quality-of-life indicators (47–49). The influence of friends has also been widely studied, with evidence for the benefits of friends' support as well as the negative effects of conflicts with friends (50).

One strategy for marshaling social influences to provide ongoing diabetes self-management support is through peer support through lay health workers and community health workers and similar interventions (41,51). A 2006 review of peer support in diabetes management recognized positive effects in terms of improved self-management behaviors and indicators of clinical status (52), whereas a World Health Organization report laid out the rationale and evidence for peer support in diabetes and identified important directions for research and program development (53). Studies have found promising results in metabolic control and quality of life of peer support provided by a trained peer to others with diabetes, through dyads providing reciprocal support, through groups, in community and clinical settings, and in combinations of all of these (54,55).

### Organizations, communities, and culture

There is increasing evidence supporting the use of ecological and community approaches for health promotion. This includes the success of long-term, multilevel community approaches to cardiovascular disease risk reduction in Finland (56); reduced prevalence of smoking and smoking-related mortality in California associated with comprehensive, multilevel campaigns to promote nonsmoking (57); and a recent multilevel, multisector program to reduce childhood obesity entitled "Shape Up Somerville" (58).

Project DIRECT (Diabetes Interventions Reaching and Educating Communities Together), the first and largest comprehensive community-based diabetes project in the U.S., aimed to demonstrate the effectiveness of a model diabetes program for state and local health departments to reduce the burden of diabetes and its complications through a high level of community involvement and with culturally appropriate interventions. Interventions were targeted in health promotion to improve diet and physical activity, outreach to improve case finding and awareness, and diabetes care to improve access and quality (59). In addition to improvement in some health outcomes, the project offered many important lessons about the development of community partnerships as an approach to diabetes interventions (60).

### Clinicians and their ecology

The importance of the quality of the patient-doctor relationship is reflected in findings that those who are satisfied with their relationship with their doctors have better adherence to diabetes treatment plans (61), whereas patients who rate their clinician communication as poor have lower adherence rates to oral medications and self-monitoring of blood glucose (62). In considering such findings, it is important to recognize that the ecological model applies not only to patients but also to clinicians who work within the context of competing time demands, financial disincentives for behavior change counseling, and lack of resources for ongoing self-management support. This highlights the importance of systems that facilitate the provision of support for behavior change.

Research such as that on Wagner's Chronic Care Model indicates the value of restructuring the delivery of clinical care (63). A number of specific system-level strategies have been shown to improve care. Social support provided by nurse case managers can promote healthier eating, medication taking, self-monitoring of blood glucose, and weight loss (64). Having regular, frequent contact with patients by telephone promoted following the treatment plan and achieved improvements in glycemic control, lipids, and blood pressure (65). Another approach to restructuring care is the group medical visit (66,67), in which patients with diabetes are scheduled for a group visit in a 2- or 3-h block of time. Individual medical visits are embedded

within this group visit that also includes educational and supportive discussions.

Comprehensive approaches to improving a range of diabetes care services, including written materials, outpatient programs, Web-based programs, telephone/nurse case management, financial incentives for physicians who met guidelines, and patient incentives for annual eye exams led to improvements in a variety of outcomes (68). The emphasis on such integration of comprehensive clinical and self-management services is relatively recent in health care, with the trend toward outcome-based reimbursement. However, audits of health plans of major employers (69) show only modest implementation and little support for such elements of care, and 60–70% of patients with diabetes report not having received self-management interventions (70).

A prominent approach to reorganizing primary care is the Patient-Centered Medical Home (PCMH), which has shown encouraging evidence for the benefits in diabetes care (71). At the organizational level, the PCMH includes resources such as electronic medical records, evidence-based algorithms and care plans, and ties to referral sources and other community-based resources for patients. The interdisciplinary, collaborative team is often emphasized as the central characteristic of the PCMH. Reflecting an ecological perspective, the team can be seen as an organizational-level intervention that then influences the dyadic interactions of clinicians and patients.

### Twenty-first century synthesis: a multilevel, multisector, interactionist perspective

In the twenty-first century, behavioral science has come to an integration of the agency of the individual patient or clinician with recognition of the multiple determinants of individuals' choices and behaviors. This reflects the broader emphasis on interactions between individual and contextual characteristics that is emerging across the life sciences.

That systems and organizations and policies are important determinants of behavior does not, in and of itself, diminish the agency of the individual. Rather, it points to the importance of systems, organizations, and policies that enhance agency and engagement of patients in their health and of professionals

in effective and health-promoting practices. Far beyond viewing the authority of the physician as the key consideration in treatment acceptance and professional satisfaction, research such as that on the PCMH has begun to articulate how effective systems of team care lead to both better outcomes and greater professional as well as patient satisfaction with health care practice. In a parallel manner, research on patient education and care has gone beyond treating the patient as existing in a vacuum, without consideration of context, and has recognized how interventions that address the resources and support patients' need for living with diabetes enhance both clinical outcomes and quality of life (72–74).

From the perspective of the ecological model of diabetes, it is not a matter of isolating the patient's responsibility, the clinician's responsibility, or the environment's responsibility; responsibility is inextricably multidimensional and diffuse. What is important is how we collaborate in our contexts to achieve shared goals. Consider for example decision making among varied and expensive preventive and treatment approaches. National policy will be unable to make available to all every health intervention that might possibly help an individual. Similarly, clinicians are unable to do all they might like for all of their patients. To avoid choices being experienced as arbitrary and bureaucratic, policy makers, professionals, and patients will need to achieve a shared understanding of being mutually subject to broad ecological influences and then work collaboratively for meaningful goals within that understanding.

Still early in the twenty-first century, we can anticipate profound changes in our understanding, clinical treatment, and behavioral management of diabetes in the years to come. Biological developments are likely to illuminate key underpinnings of diabetes in genetics and metabolism and point the way toward much sharper definition of key genotypes and their phenotypic variants. This may lead toward much more specific and "personalized" medical treatments. If personalization yields greater reliability of benefit, these treatments should recruit much greater adherence than those of the twentieth century that delivered often uncertain benefit. That is, biological progress will promote behavioral improvements in care.

At the same time, biological progress will add complexity to the landscape of

diabetes and its care, providing new challenges for patient education and behavioral medicine. Individuals will be greatly challenged to make sense of an enormous amount of information about their own genotypes and related strengths and vulnerabilities and to integrate prevention and screening for numerous diseases. They will need to adopt management regimens for the multiple chronic conditions that longer life provides, each of which, as diabetes, is likely also to experience more nuanced and thus more complicated treatment. Developing ways of sharing information, teaching more complicated skills, and supporting lifelong behavior change will be as important a frontier as medical advances.

Complementary to the technical and biological breakthroughs of twenty-first century medicine will be conceptual breakthroughs in behavioral science. We are just beginning to grasp the importance of the connections among humans and the contexts that surround us. We see this in our struggles to understand globalization of business, of our economies, and of our ecologies. Technical advances interconnect us in ways hardly imagined just a few decades ago. We used to see human relationships and social networks as amorphous, arcane, and not relevant to health. Now we understand their fundamental impact on mortality (29) and their roles subtending important contributors to health such as obesity and smoking (75). As we learn to talk about our social and other contexts, we will learn better how to engage them in efforts to help each other lead healthier lives. The marriage of cutting edge technologies with deeper understanding of human relationships will yield more powerful ways of helping individuals understand themselves and behave in healthy ways.

**Conclusions**—Diabetes is a challenging condition, both to live with and to treat. It exemplifies the role of behavior in numerous ways, starting with how key behaviors directly influence the fundamental disease process of glucose metabolism. It is unique among chronic conditions in the extent to which achieving optimal control requires the coordination of both patients and clinicians. This article has illuminated the importance of clinicians understanding the individual characteristics of their patients and their perspectives in developing mutually accepted treatment goals. It also points to the need to consider contextual

factors that impact virtually all of diabetes management. The complexity of diabetes, its impacts on diverse aspects of individuals' activity, its roots in urbanization and a plentiful food supply and other developments of our societies, and its global burden will make it a prime ground for the emergence of these many trends. The recognition of how individual patients and clinicians are reciprocally influenced by their contexts provides the template for exciting advances in health in the rest of the century.

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