Self-Management Support Interventions That Are Clinically Linked and Technology Enabled: Can They Successfully Prevent and Treat Diabetes?

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Abstract

Patients with diabetes need a complex set of services and supports. The challenge of integrating these services into the diabetes regimen can be successfully overcome through self-management support interventions that are clinically linked and technology enabled: self-management support because patients need help mastering the knowledge, attitudes, skills, and behaviors so necessary for good outcomes; interventions because comprehensive theory-based, evidence-proven, long-term, longitudinal interventions work better than direct-to-consumer or nonplanned health promotion approaches; clinically linked because patients are more likely to adopt new behaviors when the approach is in the context of a trusted therapeutic relationship and within an effective medical care system; and technology enabled because capitalizing on the amazing power of information technology leads to the delivery of cost-effective, scalable, engaging solutions that prevent and manage diabetes.

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Introduction

his article reviews how self-management support interventions that are clinically linked and technology enabled can help improve outcomes for patients with, or at risk for, diabetes. With new cases of diabetes continuing on a rapid skyward trend worldwide—from 285 million today to 435 million cases anticipated by 2030¹ health care providers and patients alike are looking for new ways to prevent, manage, and treat this illness. Now add health care reform, limited resources, and increased time constraints to the expanded patient load

and projected shortage of primary care clinicians and diabetes educators, and this issue becomes more complex and the need for solutions more critical.

Patients are demanding support and looking to the Internet and cell phones for new information, connections, and guidance.² Studies show that lifestyle and self-management support, such as physical activity and proper nutrition, play a critical role in the prevention and treatment of type 2 diabetes and in a patient's overall health.^{3–10}

Keywords: clinically linked, diabetes, intervention, prevention, self-management, support, technology enabled

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Yet health care providers do not have the time—nor is it their job—to provide this form of ongoing and comprehensive self-management support for their patients.

In short, we believe that the current labor-intensive approach to preventing and treating diabetes is no longer feasible and that self-management support interventions that are clinically linked and technology enabled are key to modern diabetes care and represent a solution whose time has long since arrived.

Background

Patients with diabetes often need a complex set of services and supports ranging from glucose monitoring, insulin, and other medication management to psychotherapy and social support to physical activity promotion, nutrition counseling, and more. With the increasing sophistication of diabetes treatment protocols and diabetes-related devices, these patients must be educated and supported on new health-promoting behaviors and learn to adopt these behaviors for the rest of their lives. To manage their disease effectively, patients with, or at risk for, diabetes must not only understand their condition, but also find the motivation and skills to set goals, solve problems, monitor outcomes, and overcome any barriers that keep them from adopting and sustaining new healthy behaviors.

Given the significant time and resource constraints of a busy medical practice, health care providers often do not have the capacity to adequately support all aspects of a successful behavior change and self-management approach. The typical way providers currently meet these needs is by providing one-on-one or group education and support. While this approach is time-tested and familiar to nearly all clinicians, it can be enhanced if longitudinal and ongoing support is provided when and where the patient needs it. In addition, given the lack of qualified staff in the variety of disciplines needed for patients with diabetes (e.g., primary care physicians, specialists, nurses, dietitians, pharmacists, psychologists, social workers, exercise physiologists, and physical trainers), it comes as no surprise that patient needs are often not met. Finally, health care systems often do not have the staff or other resources to adequately support all aspects of a successful comprehensive behavior change and selfmanagement support approach.

To integrate these supports into the complex therapeutic regimen of a patient with, or at risk for, diabetes presents challenges that theoretically can be addressed through self-management support interventions that are clinically linked and technology enabled.¹¹⁻¹⁵

Self-management support: A large proportion of the prevention and treatment of diabetes is dependent on the knowledge, attitudes, skills, and behaviors of the individual, and providing education and needed support is so important in getting good outcomes.

Interventions: Theory-based, evidence-proven, long-term, longitudinal programs that are designed for each patient based on his or her unique characteristics, changing needs, and performance are most likely to get the desired results.

Clinically linked: Patients respond best and are more likely to adopt new behaviors when the approach is in the context of a trusted therapeutic relationship and within an effective medical care system.

Technology-enabled: Capitalizing on the amazing power of the ever-improving information technology landscape leads to the delivery of cost-effective, scalable, engaging, and holistic solutions to complex clinical challenges such as the management of diabetes.

In this article, we will address the following questions:

- Should self-management interventions be enabled by information technology?
- What are the characteristics of high-quality interventions?
- What are the benefits to clinicians, patients, and health care systems?

Can Self-Management Interventions Be Enabled by Information Technology?

Widespread, low-cost Internet and cell phone access is erasing geographic, economic, and demographic barriers to obtaining health information and support online. Clinicians can now support significant changes in patient behaviors in an economical, practical, and profitable manner by incorporating information technology into patient care and support.^{16–21}

Clinical approaches are being dramatically altered by the confluence of several trends, creating a variety of new technology-enabled approaches:

• Patients want an active role in managing their own health and a collaborative relationship with their health care providers.

- Patients are comfortable accessing the Internet and report wide use of searching for medical advice and support.
- Advanced Web and cell phone technologies offer captivating methods of content delivery and high levels of interactivity that improve patient engagement.
- Clinicians and researchers have a deeper understanding of how people learn and respond online and how that knowledge can be crafted into solutions that produce effective, long-term behavior change.
- Changes in health care delivery and funding offer evolving incentives for positive outcomes and care coordination that are facilitated by clinician-enabling and patient-facing information technology.

Characteristics of High-Quality Self-Management Support Interventions^{22–28}

To maximize effectiveness, self-management support interventions should be supportive of Wagner's chroniccare model. These interventions integrate community resources with health care organizations to create prepared, proactive health care teams and lead to informed, activated patients able to successfully manage their diabetes.

Self-management support interventions have, at their core, a set of elements that are woven together to help clinicians help their patients adopt and sustain healthy behaviors. The specifics vary by condition and the characteristics of the individual, but the following elements should be included for an intervention to have maximal effect:

- Identify patients,
- Encourage program participation,
- Assess baseline status,
- Provide teaching and learning,
- Set goals,
- Motivate toward goal attainment,
- Measure results toward goals,
- Receive and provide social support,
- Find needed help, and
- Provide coaching support.

Rigorously designed interventions for patients with, or at risk for, diabetes using new models of service provision where technology enables self-management education and support show great promise to improve outcomes. The best of these approaches mimic a master clinician to educate and support a patient. The most effective interventions are based on appropriate behavior change theories, proven effective by longitudinal studies, integrated into existing medical care, able to securely provide data privacy, and continuously evaluated and enhanced. Also needed is the capacity to support all roles involved in the intervention (clinician/coach, patient, support network, administrative staff), engage a panel of patients, and scale to large numbers of users efficiently.

What Are the Benefits to Clinicians, Patients, and Health Care Systems?²⁹⁻³⁸

Self-management support interventions that are clinically linked and technology enabled can provide far-reaching and significant improvements in diabetes patient outcomes at affordable costs and with the capacity to go to scale. Adding a technology-enabled intervention to current diabetes prevention and treatment protocols benefits not only the clinician, but the patient and health care system alike.

Clinician Benefits

To be successful for clinicians and provide better outcomes for their patients, these interventions extend clinician reach while taking less time and complementing other clinical activities. These interventions support effective long-term follow up, reduce patient travel and scheduling conflicts, and improve population monitoring, tracking, and reporting. Clinicians can easily provide individualized guidance and support based on readily available analyses of each patient's characteristics and performance. Additionally, clinicians can conveniently review their patient's activities and performance online and communicate with them frequently and efficiently.

Patient Benefits

To be successful for patients, the best self-management interventions provide rich pertinent content with engaging interactive elements and offer a tailored, personalized learning and doing experience. These interventions provide self-assessment and goal-setting tools and ways for the patient to monitor personal performance as well as track changes in biologic measurements (e.g., weight, blood pressure, physical activity, and blood sugar). With direct links to the patient's many providers, as well as to family and friends for critical support, these interventions help integrate medical care with everyday life. The patient can access information and input data and receive support 24 h a day—at a time and place most convenient for them—not limited to clinician office hours and availability.

Health Care System Benefits

Effective interventions can improve outcomes and save money across the health care system. These interventions have the potential to improve patient health, decrease the use of acute and intensive services, and increase the use of approaches that help individuals maintain good health. They can also decrease a wide variety of expenses such as the cost of medical care, prevention service, evaluation, reporting, and marketing. In addition, these clinically linked, technology-enabled interventions improve the efficiency and effectiveness of managing large numbers of patients within complex health care delivery systems. These interventions also integrate with electronic medical records, patient-clinician communications, care management software, claims and billing processes, laboratory retrieval, appointment scheduling, and other information technology elements. Lastly, it is important to note that the health care system also benefits from the improved outcomes at both individual and population levels.

Challenges to Widespread Deployment

There are a variety of barriers hindering widespread acceptance of these new approaches, most notably, the difficulty patients can have adopting and sustaining new behaviors. Nearly all clinicians understand that the healthy lifestyle choices of patients with, or at risk for, diabetes are key to improving long-term outcomes. Still, many health care organizations have not fully embraced the idea that it is the organization's responsibility to provide the education and support needed to help patients adopt and sustain these positive behaviors. While other organizations are committed to providing these supports, they do not have the human or financial resources needed and are deterred by the lack of direct reimbursement.

It is also difficult to obtain evidence that a particular technology-enabled approach is effective with specific patients. The current gold standard is to perform a randomized and longitudinal controlled trial. While this approach is practical when nontechnological approaches are tested (e.g., one-on-one education and support), technology-enabled interventions are characterized by such rapid changes that, by the time a one-year program is evaluated and the results published (often three or more years), the technology studied is obsolete or, at best, out of date. Current standards for population health programs call for effective matching strategies between the intervention group and similar individuals not in the intervention using statistical methods that do not require randomization. At a minimum, the projected nontreated outcome for the treated population needs to be estimated with rigor. In addition, effective evaluations should identify those interventions that demonstrate positive results while illuminating the underlying principles and the most important technology components that lead to success. These approaches could expand the evidence base and allow for incremental improvements to already proven effective interventions now enabled by technology.

Regardless of the delivery approach, obtaining reimbursement for educational and support services can be a challenge. This is made even more difficult when the approach is enabled by technology, and it has yet to be proven effective using traditional methods. While there are other ways to cover the expenses associated with interventions (e.g., marketing and training expenses, payfor-performance bonuses, direct charge to the patient), these are difficult to justify in most settings. In new models of health care that shift the financial risk to providers (or provider organizations), it is likely that incentives will exist for improving patient behaviors that reduce costs.

Lastly, there is a challenge inherent in implementing and evaluating these interventions in the complex clinical settings in which patients are seen (e.g., primary care and specialty diabetes practices, large multispecialty group practices/health maintenance organizations/independent practice associations, disease management programs, corporate health care, community clinics). Given the unique nature of these diverse settings and the patients they serve, effective interventions will need to be efficiently customizable for each setting and circumstance.

Conclusions

Self-management support interventions for patients with, or at risk for, diabetes have the potential to make a significant improvement in patient outcomes and also a profound change in the way providers engage with patients and patients interact with clinicians and their support networks. To date, use of these interventions in clinical settings has been limited, primarily due to the lack of reimbursement for online interventions. As health care evolves toward an outcomes-based accountability framework, self-management support interventions that are scalable and affordable will provide value to multiple components of the delivery system.

By incorporating self-management support interventions that are clinically linked and technology enabled into traditional treatment modalities, patients will benefit, the overall health care system will benefit, and one clinician will be able to effectively support many patients, one patient at a time.

Disclosures:

Neal D. Kaufman is a majority owner of DPS Health. Paula D. Patnoe Woodley is a consultant at DPS Health and has an equity interest. DPS Health is a for-profit technology company that develops and deploys Internet- and cell-phone-based behavior change interventions. No DPS Health products or services were referred to in this article. One DPS program was included in the references (Reference 32).

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