This Diabetes Spectrum From Research to Practice section addresses translation as a theme. The articles focus on how intervention approaches may be applied in diabetes. The research areas address weight loss, community-based strategies for environmental change, adherence to treatment recommendations, and reducing high-risk behaviors such as smoking.

The term "translation" is becoming widely used in research to address the transfer of information from one context to another. In the research continuum, knowledge acquired in bench research is applied to clinical research, and information from clinical research is in turn applied to community or applied research. Likewise, basic research in the behavioral sciences can provide information and techniques developed to address one health issue or situation that can be applicable or translatable to another health situation.

Translation requires thinking broadly about how information in one area can be applied to another. Thinking narrowly about diabetes can limit potential applications of findings from other disease conditions. Early in the treatment of diabetes, the diabetic diet approach did address common concomitant conditions such as obesity, hypertension, and dyslipidemia. But diabetes was often viewed as an abnormality of carbohydrate metabolism rather than a complex metabolic syndrome that results in lipid and blood pressure abnormalities as well. Today, the emphasis of care has shifted from efforts to help patients survive acute problems to more complex self-management efforts aimed at preventing long-term diabetes complications.

A similar shift has occurred with advances in the treatment and increased longevity of the HIV-infected population. Indeed, diabetes is of increasing concern for patients who are treated with protease inhibitors.

In an era of medical specialization, abnormalities associated with diabetes generally have been approached separately based on body systems (endocrinology, cardiology). This compartmentalized approach became increasingly common until the rise in health care costs resulted in a shift from medical specialty care and training to an emphasis on primary care.

Historically, clinical research has also been largely organized based on disease or body system. As a result, the National Institutes of Health have focused on hypertension and dyslipidemia in the National Heart, Lung, and Blood Institute (NHLBI); diabetes was addressed at the National Institute of Diabetes and Digestive and Kidney Diseases; and high-risk behaviors such as smoking were addressed either based on body system at the NHLBI or based on disease at the National Cancer Institute. Ironically, newer research is examining epidemiological and physiological links between cancer and diabetes. Collaborations among several institutes and with other agencies such as the Division of Diabetes Translation at the Centers for Disease Control and Prevention has led to considering translation to clinical practice or public health application as an integral design feature of research.

The complex treatment regimen in diabetes makes it a good model for chronic disease self-management, in which patients, rather than providers, assume active decision-making and problem-solving responsibilities. Literature from outside the field of diabetes self-management is also potentially applicable to the expan-
sion of the mission to reduce the burden of diabetes. The results of the Diabetes Prevention Program (DPP) suggest that the burden of diabetes can be addressed by reducing the risk of developing it in individuals who have impaired glucose tolerance. The DPP’s lifestyle and medication (metformin) interventions were both effective primary prevention approaches. Examining obesity as a chronic disease may help us provide the continuity of care that is needed to reduce the concomitant health risks associated with obesity.

Findings from behavioral research often can be applied across disease states. This is most apparent with regard to smoking, which increases cardiovascular and cancer risks. The addictive nature of tobacco smoking is well established. More recently, many of the behavioral principles from smoking cessation are being applied to changing sedentary behavior and poor dietary habits. The issues that Tiffany Tibbs, MA, and Debra Haire-Joshu, PhD, raise here (p. 164) can be translated beyond smoking as a high-risk behavior.

Techniques such as motivational interviewing and addressing behavioral readiness were originally used to address addictive behaviors but are now used to address self-management and lifestyle issues in diabetes and other chronic diseases. However, as we try to translate addiction treatment approaches to the prevention and treatment of diabetes, we need to keep in mind that treating physiological addictive behaviors such as smoking differs from making changes to improve health.

The article by Clyde B. Schechter, MA, M D, FACPM, and Elizabeth A. Walker, DN Sc, RN, CDE, (p. 170) explores how methods used to promote adherence are applicable to diabetes complications screening and other aspects of self-management. The complex treatment regimen in diabetes requires that patients take active roles in decision making, which helps achieve the commitment needed to make diabetes management a priority. The goal for replacing the term “compliance” with “adherence” was to emphasize patients’ role in making decisions. Motivational interviewing techniques take us a step further by focusing on working with patients to help them identify their own motivations and goals and then providing feedback and support to help them attain their selected goals.

As the population rates of obesity and diabetes increase dramatically, a sedentary lifestyle and intake of energy-dense foods are increasingly considered to be high-risk behaviors. However, the rise in obesity is linked to environmental changes that include readily available soft drinks, snack foods, and fast foods; time pressures; and television/video games. Indeed, the American environment has been called “obesogenic.”

The article by Stephanie T. Miller, PhD, David G. Schlundt, PhD, James W. Pichert, PhD, and N asar U. Ahmed, PhD, (p. 176) provides insights about public health models for diabetes prevention and control. Their article points out that early programs may have achieved knowledge change with media campaigns targeting the population as a whole. Subsequent studies have been effective in achieving behavioral change by targeting population sub-segments rather than a broad media approach for the community at large. As obesity rates have increased, there is growing emphasis on interventions that achieve environmental changes. Advocacy for environmental change has focused on a “snack tax” to provide funding for community-based and environmental changes.

The American Diabetes Association uses an evidence-based medicine (EBM) approach to developing clinical practice guidelines. The evidence-based review of diabetes education and self-management by Norris et al. has addressed methodological issues that need to be considered in translating research into practice recommendations and policy.

EBM is often taught using the acronym PICO (Patients, Intervention, Control, and Outcome) to provide a framework both to help clinicians and students address the applicability of

<table>
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<th>Table 1. PICO</th>
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<tbody>
<tr>
<td><strong>P:</strong> Patients or populations of interest</td>
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<tr>
<td>How is the patient group or population similar to those in my practice or setting?</td>
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<tr>
<td>How do they differ? Are patients in my practice likely to face the same barriers to achieving goals?</td>
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<tr>
<td><strong>I:</strong> Intervention of interest</td>
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<tr>
<td>What elements of the intervention approach could be practically translated to my practice or care setting? What would prevent using the intervention approach? What is similar about the intervention goal? What is different?</td>
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<tr>
<td><strong>C:</strong> Control or alternative treatment</td>
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<td>How does the control alternative compare to usual practice in my community and to the intervention of interest? Are there other approaches that would be better suited to the population or setting? How likely is the amount of time staff spend counseling patients in each group to account for the study findings?</td>
</tr>
<tr>
<td><strong>O:</strong> Outcome of interest</td>
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<td>How was success evaluated? Are the study outcomes relevant to the goals for intervention in my practice?</td>
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Case Scenario

After reading an article indicating that telephone counseling increased the rate of follow-through on referrals, you need to decide if that is applicable to your practice situation. Issues you would need to consider include:

- **Do patients in your practice setting follow through on referrals?** How do the barriers to the follow-through on a referral likely to be similar? Is the level of telephone access the same?
- **How similar is your intervention goal to what was reported in the article?** Issues such as language and work hours are likely to affect the success rate of the telephone intervention.
- **What did the study use as the control alternative?** How similar is the control intervention to the usual approach used in your practice setting? A low-intensity control intervention might be to have patients send a postcard indicating that they have scheduled the appointment. A more intensive alternative might be to provide transportation if that is a barrier or perhaps to schedule appointments and provide an incentive after follow-through on the referral. Health systems are unlikely to provide financial support for these more intensive interventions.
- **What will you use as an outcome to determine if the new treatment approach is worthwhile?** Will you use self-reported information? Do you need objective documentation that the outcome goal was achieved to justify use of resources for the telephone intervention?
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research to their clinical setting and to address the quality of the research in question. Table 1 lists some issues clinicians and educators need to consider as they try to translate research findings into practical strategies for their own practice settings.

A growing body of behavioral research has implications for the clinical management of diabetes. The article by Linda M. Delahanty, M S, RD, (p.183) uses the EBM approach to address how the obesity treatment literature can be applied in diabetes.

There is a widespread belief that trying to address obesity is futile. A 1959 study by Stunkard and McLaren-Hume10 is often cited as evidence that 95% of individuals who lose weight will regain even more weight than they lost. Obesity thus can be viewed as a chronic condition that requires ongoing treatment.

We need to weigh the evidence for the efficacy of various treatment options. Intuitively, we want patients to develop decision-making skills for selecting foods from a wide variety of options. However, Ms. Delahanty discusses the research evidence indicating that limiting food choices can be an effective strategy for achieving weight loss over a 5-year period.

Research studies from other chronic diseases and community studies provide insights that can be translated to diabetes. Such research may address behavioral issues for patients, providers, health systems, and communities. Understanding the process of how behavioral goals are set and reached is essential as we face the challenge of preventing diabetes and its complications.

References

5Miller WR, Rollnick S: Motivational Interviewing. 2nd ed. New York, Gilford Press, 2002