

### In Brief

Physical barriers can pose a challenge in helping individuals achieve self-care goals. This article describes types of physical barriers and the decision-making process for developing strategies to overcome them. It also directs readers to resources offering information about, and detailed strategies for overcoming, specific physical barriers.

## Overcoming Physical Barriers to Diabetes Self-Care: Reframing Disability as an Opportunity for Ingenuity

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Of the barriers faced in facilitating self-care behaviors among individuals with diabetes, none provide such an opportunity for immediate satisfaction as those that are physical in nature, i.e., those rooted in personal disability. Compared to the systems issues, psychosocial factors, and cultural barriers discussed elsewhere in this From Research to Practice section (p. 23, 33, and 13, respectively), solutions to physical barriers are less dependent on cooperation from external institutions or on changes in attitude or belief. Much of the control remains solely with the patient-provider team. Often, a little creativity is the only bridge needed between a physical problem and its solution.

Physical barriers may or may not be diabetes-related. To compile a list of diabetes-related physical barriers, one needs only to think of the variety of diabetes-related complications and

their manifestations. Table 1<sup>1-9</sup> lists some of the barriers that can arise from the long-term complications of diabetes. Such barriers require the development of adaptive strategies.

The short-term complications of diabetes (e.g., hyperglycemic hyperosmolar nonketotic syndrome [HHNS] and diabetic ketoacidosis) generally present temporary physical barriers that are best overcome with the passage of a brief period of time. For example, before individuals with HHNS can be instructed in self-care strategies, educators must first allow for the resolution of their acute illness and restoration of their normal cognitive functioning. This article will focus on physical barriers of a more chronic nature than those presented by short-term complications.

Physical disabilities have been reported to be significantly more prevalent among individuals with dia-

**Table 1. Examples of Physical Barriers Related to the Long-Term Complications of Diabetes and Resources for Help in Overcoming Them**

<b>Long-term complication</b>	<b>Possible manifestations</b>	<b>Potential barriers</b>	<b>Resources for care providers</b>
Nephropathy	renal failure	implications of dialysis	<p>“Challenges of Diabetes and Dialysis”<sup>1</sup></p> <p>National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK): Health Information: Kidney Diseases (<a href="http://www.niddk.nih.gov/health/kidney/kidney.htm">http://www.niddk.nih.gov/health/kidney/kidney.htm</a>)</p> <p>NIDDK: National Kidney and Urologic Diseases Information Clearinghouse (<a href="http://www.niddk.nih.gov/health/kidney/nkudic.htm">http://www.niddk.nih.gov/health/kidney/nkudic.htm</a>)</p> <p>The Kidney Foundation of Canada (<a href="http://www.kidney.ca/">http://www.kidney.ca/</a>)</p>
Neuropathy: Somatic (distal symmetric polyneuropathy; focal/multifocal neuropathy)	diminished sensation; paresthesia; dysesthesia; muscle weakness; amputation	limited dexterity; exercise limitations	<p>“Exercise and Diabetes”<sup>2</sup></p>
Autonomic	impaired cardiovascular reactivity to physical stress	exercise intolerance; orthostatic hypotension	<p>“Exercise Precautions and Recommendations for Patients With Autonomic Neuropathy”<sup>3</sup> (available online at: <a href="http://www.diabetes.org/diabetesspectrum/98v11n4/pg231.htm">http://www.diabetes.org/diabetesspectrum/98v11n4/pg231.htm</a>)</p> <p>“Orthostatic Hypotension in Individuals With Diabetes”<sup>4</sup></p>
	gastroparesis	unpredictable timing of contribution of dietary carbohydrate to blood glucose level	<p>“Gastropathy in Patients With Diabetes: Current Concepts and Treatment Recommendations”<sup>5</sup></p> <p>Gastroparesis and Diabetes: National Diabetes Information Clearinghouse (<a href="http://www.niddk.nih.gov/health/digest/pubs/gastro/gastro.htm">http://www.niddk.nih.gov/health/digest/pubs/gastro/gastro.htm</a>)</p>
	hypoglycemia unawareness; impaired glucose counterregulatory response	safety limits to intensive glycemic control	<p>“Steps to Reduce the Risks of Severe Hypoglycemia”<sup>6</sup></p>
	urinary incontinence	urinary tract infections; decreased willingness to leave house (i.e., to attend appointments)	<p>“Urinary Incontinence in Individuals With Diabetes Mellitus”<sup>7</sup> (available online at: <a href="http://www.diabetes.org/diabetesspectrum/98v11n4/pg241.htm">http://www.diabetes.org/diabetesspectrum/98v11n4/pg241.htm</a>)</p>
Eye Disease	retinopathy; cataracts; glaucoma	diminished/absent visual capacity	<p>“Teaching Nonvisual Diabetes Self-Care: Choosing Appropriate Tools and Techniques for Visually Impaired Individuals”<sup>8</sup> (available online at: <a href="http://www.diabetes.org/diabetesspectrum/97v10n2/pg128.htm">http://www.diabetes.org/diabetesspectrum/97v10n2/pg128.htm</a>)</p> <p>Canadian National Institute for the Blind (<a href="http://www.cnib.ca/">http://www.cnib.ca/</a>)</p> <p>Diabetes Action Network of the National Federation of the Blind: Diabetes Resources (<a href="http://www.nfb.org/diabres.htm">http://www.nfb.org/diabres.htm</a>)</p> <p>Lighthouse International (<a href="http://www.lighthouse.org/">http://www.lighthouse.org/</a>)</p>

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**Table 1. Examples of Physical Barriers Related to the Long-Term Complications of Diabetes and Resources for Help in Overcoming Them, cont.**

Long-term complication	Possible manifestations	Potential barriers	Resources for care providers
Eye Disease, cont.			National Eye Institute ( <a href="http://www.nei.nih.gov/">http://www.nei.nih.gov/</a> )  Resources for Rehabilitation ( <a href="http://www.rfr.org/">http://www.rfr.org/</a> )  Selected Resources for People With Low Vision ( <a href="http://www.nei.nih.gov/textsite/publications/lowvis.htm">http://www.nei.nih.gov/textsite/publications/lowvis.htm</a> )
Macrovascular Disease	cerebrovascular disease	hemiplegia	"Insulin Syringes and Pens: Finding the Best Match for Your Patients' Needs" <sup>9</sup>  American Stroke Association ( <a href="http://www.strokeassociation.org/">http://www.strokeassociation.org/</a> )  National Aphasia Association ( <a href="http://www.aphasia.org/">http://www.aphasia.org/</a> )  National Stroke Association ( <a href="http://www.stroke.org/">http://www.stroke.org/</a> )  Post-Stroke Rehabilitation (Agency for Healthcare Research and Quality Clinical Guideline) ( <a href="http://text.nlm.nih.gov/ftsr/pick?collect=ahcpr&amp;dbName=psrc&amp;cd=1&amp;t=971916934">http://text.nlm.nih.gov/ftsr/pick?collect=ahcpr&amp;dbName=psrc&amp;cd=1&amp;t=971916934</a> )
	peripheral vascular disease	exercise limitations	"Exercise and Diabetes" <sup>2</sup>
	coronary heart disease	exercise limitations	
Adhesive Capsulitis	shoulder pain	limited range of motion	A Patient's Guide to Common Shoulder Problems ( <a href="http://www.secrest.com/mmg/shoulder">http://www.secrest.com/mmg/shoulder</a> )
Carpal Tunnel Syndrome	wrist pain	limited range of motion	Cumulative Trauma Disorders ( <a href="http://www.secrest.com/mmg/reflib/ctd/">http://www.secrest.com/mmg/reflib/ctd/</a> )  Carpal Tunnel Syndrome and Hypothyroidism ( <a href="http://thyroid.about.com/library/weekly/aa081098.htm">http://thyroid.about.com/library/weekly/aa081098.htm</a> )  The Carpal Tunnel Syndrome Information Page ( <a href="http://www.carpal-tunnel.com/">http://www.carpal-tunnel.com/</a> )

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betes than among those without diabetes.<sup>10,11</sup> This is not surprising, given the co-morbidities often seen with diabetes. However, it is important to remember that not all physical disabilities encountered in this population are directly caused by diabetes. Sometimes, the question of whether a barrier has been erected by a diabetes-related factor is more a matter of academic interest than of practical importance. Still, it is important to consider whether improved metabolic control would help to remove the barrier. For practical purposes, this article will focus on barriers that are likely to

arise directly from complications of diabetes.

### TYPES OF PHYSICAL BARRIERS

#### Long-term Versus Short-term Barriers

When a barrier is encountered, it is important to consider its temporal nature. The expected duration of a barrier may influence how it is addressed. For example, while it may be prudent for a patient who is permanently blind to invest in equipment for the visually impaired, it may not make sense to do so if the patient's visual impairments are short-term,

such as those expected during the recovery period for a cataract removal procedure. In the latter situation, the patient and provider may agree to teach a support person to perform certain tasks during the recovery period.

#### Cognitive Versus Noncognitive Barriers

Given the prevalence of depression and eating disorders among individuals with diabetes, it is tempting to include mental illness among the complications listed in Table 1. However, this is not the appropriate forum in which to debate the potential causal

**Table 2. How Mental Health-Related Barriers Would Fit Into Table 1 if Mental Illnesses Were Accepted as Complications of Diabetes**

Long-term complication	Possible manifestations	Potential barriers	Resources for care providers
Mental Illness	depression	decreased ability to accomplish tasks; diminished ability to concentrate	psychologist; psychiatrist “Cognitive Behavioral Group Training for Poorly Controlled Type 1 Diabetes Patients: A Psycho-educational Approach” <sup>12</sup>
	eating disorder (bulimia; binge eating; anorexia nervosa)	inconsistent eating patterns; erratic exercise patterns	Center for Mental Health Services Knowledge Exchange Network ( <a href="http://www.mentalhealth.org/">http://www.mentalhealth.org/</a> ) Mental Help Net ( <a href="http://mentalhelp.net/">http://mentalhelp.net/</a> ) National Alliance for the Mentally Ill ( <a href="http://www.nami.org/">http://www.nami.org/</a> ) National Depressive and Manic-Depressive Association ( <a href="http://www.ndmda.org/">http://www.ndmda.org/</a> ) National Institute of Mental Health ( <a href="http://www.nimh.nih.gov/">http://www.nimh.nih.gov/</a> ) PsyCom.net ( <a href="http://www.psycom.net/">http://www.psycom.net/</a> ) Substance Abuse and Mental Health Services Administration ( <a href="http://www.samhsa.gov/">http://www.samhsa.gov/</a> ) National Institute of Mental Health: Eating Disorders ( <a href="http://www.mentalhealth.com/book/p45-eat1.html">http://www.mentalhealth.com/book/p45-eat1.html</a> ) “Women, Diabetes, and Disordered Eating” <sup>13</sup> (available online at: <a href="http://www.diabetes.org/diabetesspectrum/97v10n3/pg191.htm">http://www.diabetes.org/diabetesspectrum/97v10n3/pg191.htm</a> ) “Nutrition Intervention in the Treatment of Anorexia Nervosa, Bulimia Nervosa, and Binge Eating (Position Statement).” <sup>14</sup> (available online at: <a href="http://www.eatright.org/aanorexiainter.html">http://www.eatright.org/aanorexiainter.html</a> )

relationship between diabetes and mental illness. Therefore, Table 2<sup>12-14</sup> is presented only as a theoretical extension of Table 1. Whether complications or co-morbidities, mental illnesses will be encountered in patients with diabetes. Health care professionals should learn how to recognize the more common mental illnesses (i.e., major depression, bipolar disorder, anxiety disorders), the subtleties of which can increase the likelihood that they will be overlooked.

Noncognitive barriers can often be addressed by mechanical means (e.g., adaptive devices). Implementing such strategies can not only directly achieve the desired outcomes, but also can be

relatively independent of treatment of the underlying cause of the barrier. Conversely, cognitive barriers, such as those presented by mental illnesses, often must be directly addressed before success can be achieved in the area of diabetes self-care behaviors.

### FACTORS TO CONSIDER WHEN DEVELOPING A STRATEGY

#### Locus of Control and Desire for Independence

The most important factor to ascertain when working with individuals to overcome physical barriers is their desire to be independent in their self-care. Except in the case of a mental ill-

ness when the underlying condition may need to be addressed as a priority, individuals' self-efficacy and desire to care for themselves will override all other issues.

With individuals who take a passive approach to their situation, health care providers may have difficulty engaging them in trying adaptive techniques. For individuals who place importance on being able to care for themselves, all efforts must be put into maximizing their personal resourcefulness, even if they have strong support from significant others. The article by Glasgow et al. (p. 33) provides a more in-depth discussion of self-efficacy issues.

## What to Address First: Choosing The Chicken or The Egg

Sometimes, the degree of diabetes management and the influence of a physical barrier are interdependent. For patients with gastroparesis or depression, for example, the complication can affect glycemic control, and glycemic control can affect the complication.

Often, a two-pronged approach addressing both directions of the causal relationship makes sense. At other times, one aspect takes priority over the other. In the case of gastroparesis, for example, one may implement a strategy using postprandial administration of lispro to help regulate glycemic control while trying a pharmaceutical approach to stabilizing gastric motility. In the case of depression, however, treatment of depression itself may be required before realistic self-care strategies to improve glycemic control can be implemented.

## RESOURCES FOR OVERCOMING PHYSICAL BARRIERS

A comprehensive listing of specific strategies to use when addressing each of the physical barriers that are routinely encountered when working with patients with diabetes is well beyond the scope of this article. Indeed, a listing of strategies for any one of the physical barriers could require an entire journal article on its own. However, because such detailed information is vitally important to health care providers, Tables 1 and 2 direct readers to existing resources that offer specific interventions and suggestions to consider for each barrier.

### Adaptive Devices

Often, physical barriers to self-care can be overcome with the use of adaptive devices. Several organizations dedicated to serving individuals with impaired vision or limited mobility publish catalogs filled with creative inventions designed to promote independence among these populations. Table 1 provides the name and World Wide Web addresses of several of these organizations. The annual "Resource Guide" published in *Diabetes Forecast* magazine is also helpful. It provides a comprehensive

listing of diabetes supplies and information about how to contact manufacturers.

### Teamwork

Chances are good that when a barrier presents itself, it is not the first time it has been encountered. Networking with one's colleagues can provide surprisingly quick and easy solutions to barriers that may at first have seemed insurmountable. Success is greatly enhanced when one seeks the input of professionals outside of the field of diabetes—not only health care professionals specializing in other areas, but also professionals from other fields, such as engineering.

### Ingenuity

One of the richest lessons health care professionals can learn is to act on the acknowledgement that health care is as much an art as it is a science. That means not discounting one's own creative troubleshooting or the creativity and ingenuity of one's patients. If strategies were limited to those that have withstood formal research scrutiny and validation, many of the insights offered by the resources listed in Tables 1 and 2 would not exist today. At one time, they were novel ideas, too.

## SUMMARY

Sometimes, our patients encounter barriers that cannot be overcome as they had hoped (e.g., an independent person might have to rely on someone else for some component of care). These situations can be frustrating, but that frustration can be blunted when the patient and health care professional know that all other avenues have been exhausted.

To health care professionals, nothing is as rewarding as helping our patients achieve their goals. The reward is only heightened when a challenging barrier has to be overcome in the process. Determination is the key to success in overcoming barriers, for it is determination that fuels the transition of hope into satisfying reality.

## References

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