

## Chapter

## 1

## THE BURDEN OF DIABETES

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The United States and the rest of the world are in the midst of a diabetes epidemic. Currently in the United States, approximately 17 million people or 8.6% of the adult population aged 20 and older have diabetes. Each year 1 million new cases are diagnosed, yet almost 6 million people, or around one-third of those with diabetes, remain undiagnosed.<sup>1</sup> Another 16 to 26 million people have “pre-diabetes,” a term that has been adopted to describe states in which a person’s blood glucose levels are higher than normal, but not high enough for a diagnosis of diabetes. Individuals with pre-diabetes have impaired fasting glucose (IFG) and/or impaired glucose tolerance (IGT) and are at significant risk of the development of type 2 diabetes. Studies show that most people with pre-diabetes develop type 2 diabetes within 10 years.<sup>2</sup>

The Centers for Disease Control (CDC) project that diagnosis rates for diabetes will increase by 165% over the next 50 years. This increase may be attributable to certain US population characteristics, such as increasing age, obesity, and members of ethnic groups with a very high prevalence of both diabetes and pre-diabetes:

- ▲ People in the United States are living longer, and the risk of type 2 diabetes increases with age; more than 20% of those 65 and older have the disease.<sup>1</sup>
- ▲ Obesity is also increasing epidemically in the United States, most likely due to sedentary lifestyles, poor eating habits, and an abundance of convenient, high-fat foods.<sup>3</sup>

▲ Particularly disturbing is the increase in incidence of type 2 diabetes in children and adolescents, especially among minority groups, such as African American, Hispanic, and Native American.<sup>2</sup>

### **DIABETES TOLL: COMPLICATIONS, MORTALITY, AND RESTRICTED LIFESTYLE**

Recent advances in oral and insulin antidiabetic medications, blood glucose monitoring, and insulin delivery systems have improved the ability to achieve good glycemic control. However, diabetes remains a serious health threat to the US population. In 1999, about half a million deaths occurred among people with diabetes—approximately 20% of all US deaths among those 25 years of age and older. Having diabetes doubles an individual's risk of death at a given age.<sup>1</sup> Diabetic complications, especially cardiovascular disease, are the major reasons for this increased mortality<sup>1</sup>:

- ▲ Heart disease is 2 to 4 times higher in people with diabetes.
- ▲ 70% of adults with diabetes also have hypertension.
- ▲ Diabetes is the leading cause of blindness among adults aged 20 to 74.
- ▲ Diabetes is the leading cause of end-stage kidney disease.
- ▲ More than 50% of patients with diabetes have neuropathy.

Diabetes is also associated with an increased risk for depression, polycystic ovary syndrome, and erectile dysfunction. Diabetes and its treatment adversely affect overall quality of life. For example, one study concluded that among those aged 60 and older with diabetes, 32% of women, and 15% of men were unable to walk  $\frac{1}{4}$  mile, climb stairs, or do housework.<sup>4</sup>

### **QUALITY OF CARE AND INFORMATION FOR PEOPLE WITH DIABETES**

Most Americans with diabetes do not realize they are at higher than average risk for heart attack or stroke, and 60% do not

know they are at risk for high blood pressure or high cholesterol.<sup>5</sup> These data indicate a serious lapse in information exchange between health care providers, public health agencies, and diabetes patients.

Currently, there is no standardized national reference for assessing our nation's quality of diabetes care. The ADA outlines standards of care and treatment targets in its annual Clinical Practice Guidelines; however, only a minority of adult diabetes patients are achieving ADA targets.<sup>6,7</sup> The Third US National Health and Nutrition Examination Survey (NHANES III) indicates that only 29% of diabetes patients have their A1C tested annually. (The ADA recommendations suggest a minimum of twice-yearly testing.)<sup>8</sup> Less than one-half of the US population with diabetes has A1C levels <7%, while 14% have A1C levels of >10%.<sup>9</sup>

The failure to achieve standards of care and therapy targets relates, in part, to a lack of an organized, systematic approach to providing care. Elements of an organized program of care include:

- ▲ Systematic tracking of processes, outcomes, and follow-up of interventions
- ▲ Dissemination and utilization of practice guidelines and clinical discoveries
- ▲ Involvement of a multidisciplinary treatment team in patient care
- ▲ Readily available diabetes education and support

### **THE COST OF DIABETES**

Diabetes costs the United States \$132 billion in direct and indirect costs annually—\$91.8 billion in direct medical costs and \$39.8 billion due to disability, work loss, and premature mortality.<sup>10</sup> The bulk of medical costs are related to patients' glycemic control; for example, one study demonstrated that patients' medical care charges increase significantly with each 1% increase in A1C above 6%.<sup>11</sup>

## **DEMONSTRATED BENEFITS OF IMPROVED CARE**

Controlled clinical trials have clearly demonstrated that improved glycemic control can prevent or delay microvascular complications associated with diabetes. Accumulating evidence also suggests that glycemic control can decrease the development and/or progression of macrovascular disease.<sup>12-16</sup>

The United Kingdom Prospective Diabetes Study (UKPDS), involving more than 4,000 patients and lasting more than 10 years, demonstrated that a 0.9% reduction in A1C was associated with a 12% reduction in any diabetes-related endpoint ( $P = 0.029$ ), including a 25% risk reduction for microvascular complications ( $P = 0.0099$ ). In the epidemiologic analysis, for every 1% reduction in A1C, the risks of all-cause mortality and myocardial infarction were reduced by 14%, and the risk of diabetes-related death was reduced by 21%.<sup>16</sup>

Controlling glycemic levels leads to decreased costs and improved quality of life for patients. In one study, examination of a managed care organization (MCO) records over a 5-year period showed that reductions of A1C levels among adults with diabetes significantly reduced health care costs.<sup>17</sup> Significant improvements in quality-of-life measures (symptom distress, overall perceived health, mental and emotional health, and cognitive functioning) and economic benefits (reduced absenteeism and restricted activity days) also occurred.<sup>18,19</sup>

### **SUMMARY**

Diabetes presents a major challenge to the health care industry now and in the foreseeable future. However, strategies for the improved management of diabetes and its associated conditions are available. Compelling evidence indicates that controlling glycemic levels as well as hypertension and dyslipidemia in diabetes patients cost-effectively reduces the risk of related morbidity and mortality and improves their quality of life.<sup>12-14,18,20-22</sup>

Increased dissemination of research findings, practically useful treatment guidelines, and a more systematic approach to care using a multidisciplinary team are needed to improve outcomes of care for patients with diabetes. This book will provide readers

with very current information on diabetes as well as offer CADRE's evidence-based recommendations for treatment.

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