

Diabetes: A National Plan for Action



 U.S. Department of Health and Human Services

December 2004



Steps to a
HealthierUS



U.S. Department of Health
and Human Services

MESSAGE FROM THE SECRETARY

Currently, more than 18 million Americans have diabetes and are at risk for related complications like heart disease, stroke, blindness, amputations and kidney disease. On average, every 25 seconds, someone in the United States is diagnosed with diabetes. Diabetes rates are steadily increasing in America, and millions are unaware that they have the disease.

Yet these facts do not tell the whole story of the true impact that diabetes has on Americans. Diabetes touches millions of Americans and their families and friends in ways that are difficult if not impossible to measure. Diabetes and its complications seriously diminish the quality of life for individuals suffering from this disease. In order to reverse these trends, the U.S. Department of Health and Human Services has increased its efforts to address this health crisis.

I am proud to present our *Diabetes: A National Plan for Action*. This plan will help mobilize individuals, communities, businesses, and other organizations to address the rising rates of diabetes and its consequences. Many key stakeholders, such as government agencies, elected officials, public health experts, providers, professional organizations, and individuals impacted by diabetes, contributed to this document.

The document provides up-to-date and accurate prevention, detection and treatment information, and includes simple action steps for individuals, families, health practitioners, policy-makers, government officials, employers, others in the medical community and members of the media to address this growing public health problem. It also provides screening tools, information on other federal diabetes programs, and listings of federally funded resources. We hope that this document not only will be informative, but also will encourage all interested persons to work together to reduce the burden that diabetes imposes on our nation. Only by joining together can we overcome this public health threat and secure a healthier future for our children. No effort is too small, and no specialized training is required, to begin to improve your health or the health of your family or community.

I thank the many public and private health professionals who have pooled their talents to develop this document and for their tireless efforts in diabetes prevention, detection, and treatment.

Tommy G. Thompson

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CONTENTS

<u>Section</u>	<u>Page</u>
Executive Summary	iii
Introduction.....	1
What Is Diabetes?	4
Risk Factors for Diabetes.....	5
Health Problems Related to Diabetes	7
Diabetes: A National Plan for Action.....	10
Prevention	13
Importance of Diabetes Prevention.....	13
Action Steps for Prevention.....	14
Detection	23
The Importance of Early Diabetes Detection	23
Action Steps for Detection.....	25
Treatment	31
The Importance of Diabetes Treatment and Management.....	31
Action Steps for Treatment.....	31
List of Acronyms and Abbreviations.....	43
Appendices	
Appendix A: <i>Steps to a HealthierUS</i>	45
Appendix B: Medicare and Diabetes	51
Appendix C: Development of Diabetes: A National Plan for Action.....	55
Appendix D: Current Federal Diabetes Activities/Highlights	63
Appendix E: Are You at Risk for Diabetes?.....	75

FIGURES

<u>Number</u>	<u>Page</u>
1. Prevalence of Diagnosed and Projected Diagnosed Diabetes Cases in the United States, 1960- 2050	1
2. Age-Adjusted Total Prevalence of Diabetes in People Aged 20 Years or Older, by Race/Ethnicity: United States, 2002	2
3. Body Mass Index	7
4. Prevalence of diabetic retinopathy among adults 40 years and older (2000)	7
5. Primary causes for kidney failure (1998).....	8
6. Projected increase in total heart disease deaths related to increased diabetes prevalence	8
7. Age-standardized Rate of Hospital Discharge for Non-traumatic Lower Extremity Amputation per 1,000 Diabetic Population, by Race, United States, 1980-2001.....	9
8. Vigorous physical activity in adolescents by grade level, 2001	13

TABLES

<u>Number</u>	<u>Page</u>
1. Risk Factors and Associated Medical Conditions for Diabetes.....	6
2. Signs and Symptoms of Diabetes	24
3. Symptoms of Hypoglycemia and Hyperglycemia	32
4. Diabetes Care Checklist.....	34
5. Examples of Items to Include in Flow Chart for Patients with Diabetes.....	36

EXECUTIVE SUMMARY

Currently, more than 18 million Americans have diabetes and projections show that the number of persons with the disease will continue to grow without public health intervention.¹ Diabetes consists of a group of diseases in which the body is unable to produce insulin (type 1 diabetes) or makes too little insulin and resists its action (type 2 diabetes). In addition to diabetes, an estimated 41 million Americans have pre-diabetes, a condition that puts them at high risk for developing type 2 diabetes.² If current trends continue, one in every three children born in the year 2000 will develop diabetes within their lifetime.³ Diabetes often causes severe complications that can include heart disease and stroke, blindness, lower extremity amputations, kidney failure, dental disease, and increased susceptibility to infections.⁴ In addition to the personal and social costs resulting from impaired health and quality of life for people affected by diabetes, the disease also carries significant economic costs. Estimates suggest the cost of diabetes to be about \$132 billion per year.⁵

Diabetes is a serious public health problem, but the good news is that important advances are being made in prevention, detection, and treatment of diabetes. For example, the Diabetes Control and Complications Trial established that intensive control of blood glucose levels greatly reduces complications for people with type 1 diabetes, and the U.K. Prospective Diabetes Study has shown similar dramatic reductions in complications with control of blood glucose for persons with type 2 diabetes.⁶ In 2002, results from the Diabetes Prevention Program demonstrated that type 2 diabetes can be prevented or delayed by weight loss and increased physical activity for many people at risk for the disease.⁷ These findings provide exciting evidence that the potentially devastating consequences of diabetes can be reduced dramatically.

¹ Centers for Disease Control and Prevention (CDC). (2003). *Promising practices in chronic disease prevention and control: A public health framework for action*. Atlanta, GA: Department of Health and Human Services.

² U.S. Department of Health and Human Services. *Prevention: A blueprint for action*. Available at: <http://aspe.hhs.gov/health/blueprint/>.

³ Narayan KM, Boyle JP, Thompson TJ, Sorensen SW, Williamson DF. (2003). Lifetime risk for diabetes mellitus in the United States. *Journal of the American Medical Association*, 290(14), 1884-1890.

⁴ CDC, op.cit.

⁵ American Diabetes Association (ADA). (2003) Economic costs of diabetes in the U.S. in 2002. *Diabetes Care*, 26, 917-932.

⁶ The Diabetes Control and Complications Trial Research Group (1993). The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *The New England Journal of Medicine*, 329(14), 977-986; and Turner, RC. (1998). The U.K. prospective diabetes study: A review. *Diabetes Care*, 21(Suppl. 3), C35-C38.

⁷ Diabetes Prevention Program Research Group. (2002). Reduction in the incidence of type 2 diabetes with lifestyle intervention or Metformin. *New England Journal of Medicine*, 346(6), 393-403.

However, without significant action, the prevalence of diabetes, together with diabetes-related complications, will continue to increase.

To help ensure that Americans take the steps needed to quell the growing diabetes problem, Secretary of Health and Human Services Tommy G. Thompson has identified diabetes prevention, detection, and treatment as one of the central components of his health agenda for the nation. Activities supporting the Secretary's focus on diabetes include *Steps to a HealthierUS: Putting Prevention First*, the *Diabetes Detection Initiative*, and the *Small Steps, Big Rewards, Prevent Type 2 Diabetes* campaign. In addition, the Medicare Prescription Drug, Improvement, and Modernization Act (MMA) of 2003, establishes coverage of a one-time "Welcome to Medicare Physical Examination" within 6 months of a beneficiary's first coverage under Part B to encourage health promotion and disease detection. The MMA also adds coverage for cardiovascular and diabetes screening for Medicare beneficiaries. Both benefits take effect January 1, 2005. More information on MMA and Medicare benefits in general can be found at <http://www.medicare.gov/> or 1-800-Medicare (1-800-633-4227). Appendix B provides additional information on diabetes benefits offered through Medicare.

The *Diabetes: A National Plan for Action* is the latest initiative sponsored by the U.S. Department of Health and Human Services to address diabetes prevention, detection, and treatment. Prompted by the Secretary's commitment to disease prevention and health promotion, together with efforts of individuals and organizations—including the American Diabetes Association, Juvenile Diabetes Research Foundation International, American Association of Diabetes Educators, and other professional associations—the national action plan utilizes a comprehensive action-oriented approach to identify activities among relevant stakeholders to improve diabetes prevention, detection, and care.

This document is designed to:

1. Reduce the prevalence of diabetes and factors that increase the risk of diabetes;
2. Promote improved diabetes detection, monitoring, and treatment; and
3. Reduce the complications of diabetes.

The plan seeks to raise national awareness of existing resources, facilitate and coordinate efforts, and leverage resources for the prevention, detection, and treatment of diabetes. In addition, the plan outlines steps individual Americans can take to help prevent or delay type 2 diabetes, together with recommendations persons already diagnosed with diabetes can use to prevent or

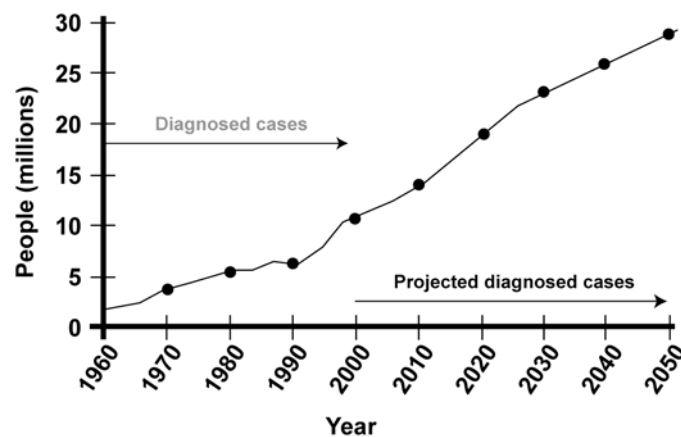
delay complications from the disease. However, individual action alone is not sufficient for addressing diabetes. Thus, the plan also recommends and outlines action steps for families, friends, health care providers, schools, the media, communities, health insurance providers, employers, researchers and professional educators, and tribal and other government agencies, to help mitigate the increase in the prevalence of diabetes and its complications. Additional information and resources about diabetes prevention, detection, and treatment are also provided.

INTRODUCTION

Diabetes is approaching epidemic proportions in the United States. More than 18 million Americans today have diabetes. Approximately 41 million Americans have pre-diabetes,⁸ which means they are at high risk for developing type 2 diabetes.⁹ For people with diabetes, blood glucose (sugar) levels are elevated either because the body cannot make adequate amounts of the hormone insulin and/or its cells do not respond to insulin.¹⁰

Over the past half century, there has been a four- to eight-fold increase in the prevalence of diagnosed cases of diabetes in the U.S.¹¹ In 2002, the prevalence of diagnosed diabetes among people aged 20 years or older was 8.7 percent and among 60 years or older was 18.3 percent.¹² From 1997 through 2002, the number of new cases of diagnosed diabetes per year increased from 878,000 to 1,291,000 (a 47 percent increase).¹³ Projections of diabetes for future years are not encouraging (Figure 1). A 165 percent increase in the number of persons with diabetes in the U.S. is

Figure 1. Prevalence of Diagnosed and Projected Diagnosed Diabetes Cases in the United States, 1960-2050



SOURCE: Data for 1960–1998 from the National Health Interview Survey, National Center for Health Statistics (NCHS). Centers for Disease Control and Prevention (CDC) projected data for 2000–2050 from the Behavioral Risk Factor Surveillance System, Division of Diabetes Translation, CDC. (Note: The “Diagnosed cases” arrow refers to the section of the figure that includes diagnosed cases of diabetes versus the section that includes projected cases. The line graph and not the line arrow indicate the number of diagnosed cases.)

⁸ Pre-diabetes is a condition defined by impaired fasting glucose (IFG) or impaired glucose tolerance (IGT) or both.

⁹ CDC, op.cit.

¹⁰ *ibid.*

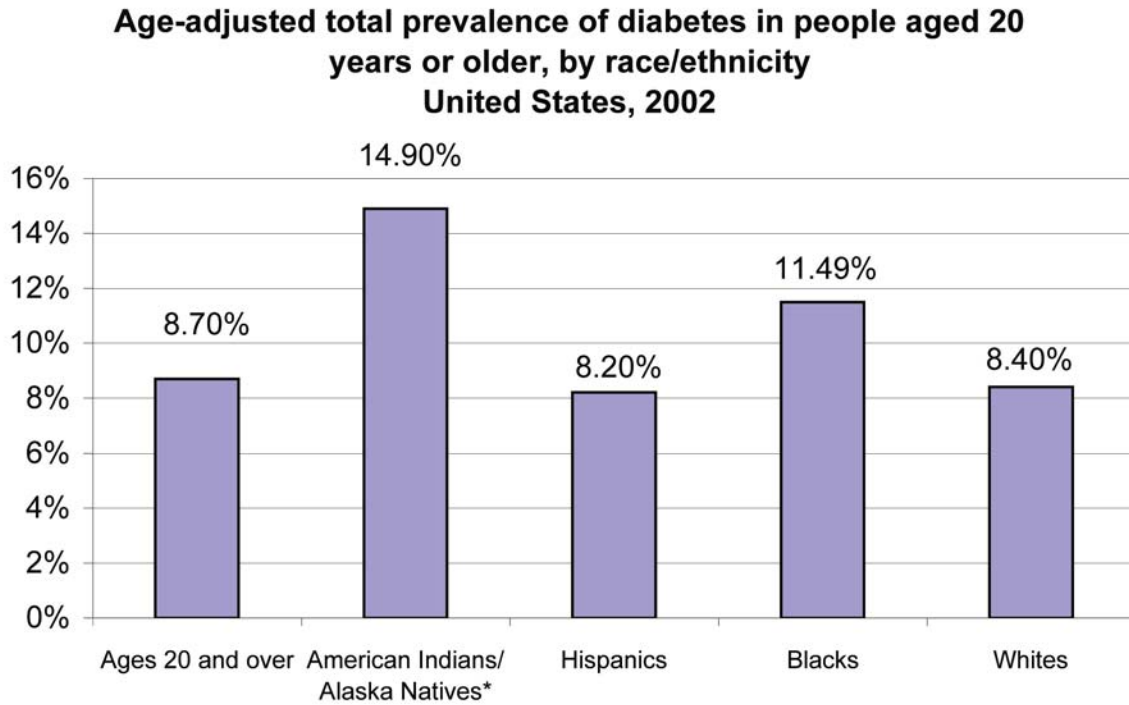
¹¹ Centers for Disease Control and Prevention (CDC). *Diabetes Surveillance System*. Atlanta, GA, U.S. Department of Health and Human Services. Available at: <http://www.cdc.gov/diabetes/statistics/index.htm>; and Kenny SJ, Aubert RE, Geiss LS. Prevalence and incidence of non-insulin-dependent diabetes, in Harris MI, Cowie CC, Stern MP, Boyko EJ, Reiber GE, Bennette Ph (eds). (1995). *Diabetes in America*, 2nd ed. Bethesda, MD: National Institutes of Health.

¹² Centers for Disease Control and Prevention (CDC). *Diabetes Surveillance System*. Atlanta, GA, U.S. Department of Health and Human Services. Available at: <http://www.cdc.gov/diabetes/statistics/index.htm>.

¹³ Centers for Disease Control and Prevention (CDC). *Diabetes Surveillance System. Incidence of diabetes*. Available at: <http://www.cdc.gov/diabetes/statistics/incidence/fig1.htm>. Accessed September 15, 2004.

projected through 2050, with a rise from 11 million to 29 million diagnosed persons of all ages.¹⁴ Without preventive action, one in every three children born in the year 2000 will develop diabetes in their lifetime.¹⁵

Figure 2. Age-Adjusted Total Prevalence of Diabetes in People Aged 20 Years or Older, by Race/Ethnicity: United States, 2002



SOURCE: 1999-2001 National Health Interview Survey and 1999-2000 National Health and Nutrition Examination Survey estimates projected to year 2002. 2002 outpatient database of the Indian. (Note: Whites refers to non-Hispanic Whites, and Blacks refers to non-Hispanic Blacks).

*AI/AN who receive care from the IHS.

In addition, minority populations are disproportionately affected by diabetes (Figure 2). On average Blacks, Hispanics, and American Indians and Alaska Natives are more likely (1.6 to 2.3 times as likely) to have diabetes than non-Hispanic Whites.¹⁶ Rates of diabetes-related deaths

¹⁴ Boyle JP, Honeycutt AA, Narayan KM, Hoerger TJ, Geiss LS, Chen H, Thompson TJ. (2001). Projection of diabetes burden through 2050: Impact of changing demography and disease prevalence in the U.S. *Diabetes Care*, 24(11), 1936-1940.

¹⁵ Narayan, op.cit.

¹⁶ Centers for Disease Control and Prevention (CDC). (2003). *National diabetes fact sheet: General information and national estimates on diabetes in the United States*. Atlanta, GA: U.S. Department of Health and Human Services.

are higher among Blacks, American Indians, and Hispanics than for Whites,¹⁷ and diabetes is the 5th leading cause of death for Asian and Pacific Islanders.¹⁸ Certain minority groups also have much higher rates of diabetes-related complications, in some cases as much as 50 percent more than the diabetes population. For example, Blacks are more likely to have serious complications from diabetes, such as end-stage renal disease and lower extremity amputations.¹⁹

Costs of diabetes are high in both human and economic terms. While estimating the national costs for diabetes over time is difficult because of changes in the U.S. population and changes in the cost of health care services, evidence suggests that these costs are high and rising. The American Diabetes Association (ADA) estimated the national cost of diabetes for 2002 to be approximately \$132 billion: \$92 billion for direct medical expenditures and \$40 billion for indirect costs, such as lost work days, restricted activity days, and mortality and permanent disability due to diabetes.²⁰ Research from the Centers for Disease Control and Prevention (CDC) indicates that people with diabetes miss 8.3 days per year from work, compared to 1.7 days for people without diabetes.²¹ In the same ADA study, it is projected that the annual costs of diabetes (in 2002 dollars) could rise to \$156 billion by 2010 and to \$192 billion in 2020. By 2020, direct medical costs are estimated to increase to \$138 billion and indirect costs from lost productivity could increase to \$54 billion.²²

Services, Centers for Disease Control and Prevention. Available at:
http://www.cdc.gov/diabetes/pubs/pdf/ndfs_2003.pdf.

¹⁷ *ibid.*

¹⁸ National Center for Health Statistics. (2003). 15 Leading causes of death for Asian and Pacific Islanders, 2001 Chart, *Health, United States, 2003*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Available at http://www.omhrc.gov/healthgap/datastats_aapi1.pdf.

¹⁹ World Health Organization. *Global strategy on diet, physical activity and health*. Available at: http://www.who.int/gb/ebwha/pdf_files/WHA57/A57_R17-en.pdf. Accessed May 28, 2004; Centers for Disease Control and Prevention (CDC). (2003). *Diabetes surveillance, 2003*. [Statistics. 2003 surveillance report]. Atlanta: National Center for Chronic Disease and Prevention and Health Promotion, Centers for Disease Control and Prevention. Available at: <http://www.cdc.gov/diabetes/statistics/esrd/fig5.htm>; Agency for Healthcare Research and Quality (AHRQ). (2001). *Diabetes disparities among racial and ethnic minorities*. (AHRQ Pub. NO. 02-P007). Rockville, MD: AHRQ. Available at <http://www.ahrq.gov/research/diabdsp.htm>; and Gornic, ME, Eggers P.W, Reilly TW, Mentnech RM, Fitterman LK, Kucken LE, Vladeck BC. (1996). Effects of race and income on mortality and use of services among Medicare beneficiaries. *New England Journal of Medicine*, 335(11), 791-799.

²⁰ American Diabetes Association (ADA). *Direct and indirect costs of Diabetes in the United States*. (2003). Available at: <http://www.diabetes.org/diabetes-statistics/cost-of-diabetes-in-us.jsp>. Accessed September 15, 2004; and ADA, *op.cit.*, Economic costs of diabetes.

²¹ Centers for Disease Control and Prevention (CDC). *Fact sheet, Diabetes at work.org*. Available at: <http://www.cdc.gov/diabetes/pubs/factsheets/atwork.htm>. 2004.

²² ADA, *op.cit.*, Economic costs of diabetes.

What Is Diabetes?

Diabetes is typically classified according to three main types—type 1 diabetes, type 2 diabetes including a related condition called pre-diabetes, and gestational diabetes.

Type 1 diabetes (previously called “juvenile diabetes”) is an autoimmune disorder in which the insulin producing beta cells are destroyed by the body’s immune system. As a result the body is unable to produce insulin. Without insulin, the body is unable to use glucose (sugar) as energy for everyday activities. Individuals with type 1 diabetes must take insulin by injection or pump every day to survive. This type of diabetes occurs in 5 percent to 10 percent of Americans who are diagnosed with diabetes. Children and adolescents are most often diagnosed with type 1 diabetes although a significant portion of those with type 1 diabetes are diagnosed as adults.

Type 2 diabetes (previously called “adult onset diabetes”) is the most common form of diabetes, accounting for about 90 percent to 95 percent of all diabetes cases. In this type of diabetes, the body does not produce enough insulin and/or the body’s cells become resistant to insulin. Insulin resistance occurs when the body’s muscle, fat, and liver cells do not respond to insulin. The pancreas tries to keep up with the demand for insulin by producing more. Since insulin helps to mobilize glucose from the blood stream into cells, excess glucose builds up in the blood stream. Many people with insulin resistance have high levels of blood glucose and high levels of insulin circulating in their blood at the same time indicating that the cells are not responding properly to insulin.

A related condition, called **pre-diabetes**, occurs when a person’s blood sugar levels are higher than normal, but not high enough for a diagnosis of diabetes. People with pre-diabetes have impaired fasting glucose (fasting blood sugar level is 100 to 125 milligrams per deciliter [mg/dl]) or impaired glucose tolerance (blood sugar level is 140 to 199 mg/dl after a 2-hour oral glucose tolerance test).²³

People with pre-diabetes and type 2 diabetes often do not show symptoms and they do not know that they have the conditions. The Diabetes Prevention Program—a major clinical trial in 3,234 people with impaired glucose tolerance—showed that in some individuals the loss of 5 percent to 7 percent of body weight reduced their risk of

²³ National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). *Insulin resistance and pre-diabetes*. NIH Publication No. 04-4893. Available at: <http://diabetes.niddk.nih.gov/dm/pubs/insulinresistance/index.htm>. 2004.

developing type 2 diabetes by 58 percent.²⁴ This study also suggested that people with pre-diabetes can prevent or delay the development of type 2 diabetes through lifestyle changes that include eating a low-calorie, low-fat diet to lose weight and getting 150 minutes of physical activity a week.²⁵

Gestational diabetes is a form of diabetes that occurs in some women who have high blood glucose levels during pregnancy but have never had diabetes before. This type of diabetes may disappear after the pregnancy ends, but women who have had gestational diabetes have a 20 percent to 50 percent chance of developing type 2 diabetes in the next 5 to 10 years.²⁶

Risk Factors for Diabetes

Diabetes occurs in people of all ages and racial and ethnic groups. Researchers do not fully understand the cause of type 1 diabetes or what can be done to prevent it. Research suggests that type 1 diabetes has a strong genetic basis that is modified by environmental factors. Certain viruses are among the factors that have been suggested, but the definitive factors have yet to be determined.²⁷ Having a family member with type 1 diabetes puts one at higher risk for developing the disease.²⁸ However, most type 1 diabetes patients do not have a family history of the disease. Research is currently being done to learn more about the genetic and environmental factors important in type 1 diabetes.

²⁴ Diabetes Prevention Program Research Group, op.cit.

²⁵ *ibid.*

²⁶ National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). *What I need to know about gestational diabetes*. NIH Pub No. 04-5129. Available at: <http://diabetes.niddk.nih.gov/dm/pubs/gestational/#3>. Accessed May 28, 2004.

²⁷ Graves PM, Norris JM, Pallansch MA, Gerling IC, Rewers M. (1997). The role of enterviral infections in the development of IDDM: Limitations of current approaches. *Diabetes*, 46: 161-168; and Salminen KK, Vuorinen T, Oikarinen S, Helminen M, Simell S, Knip M, Ilonen J, Simell O, and Hyöty H. (2004). Isolation of enterovirus strains from children with preclinical type 1 diabetes. *Diabetes Medicine*, 21:156-164.

²⁸ Diabetes Research Working Group. *Conquering Diabetes: Highlights of program efforts, research advances and opportunities*. Available at: <http://www.niddk.nih.gov/federal/dwg/2002/3summary.pdf>. 2002.

Table 1. Risk Factors and Associated Medical Conditions for Diabetes

Risk Factor	Type 1 Diabetes	Type 2 Diabetes	Pre-diabetes	Gestational Diabetes
Family History				
Family member with diabetes	X	X	X	X
Lifestyle				
Overweight or obesity		X	X	X
Sedentary lifestyle (exercise fewer than three times per week)		X	X	X
Associated Medical Conditions or Events				
Impaired glucose tolerance or impaired fasting glucose		X	X	X
High blood pressure		X	X	
Low HDL cholesterol and/or high triglycerides		X	X	
History of gestational diabetes		X	X	X
Delivered baby 9 lbs. or heavier		X	X	X
Race/Ethnicity				
Black		X	X	X
Hispanic/Latino American		X	X	X
Native American		X	X	X
Asian American		X	X	X
Native Hawaiian or Pacific Islander ancestry		X	X	X

SOURCES: National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). *Am I at risk for type 2 diabetes?* NIH Publication No. 04-4805. Available at: <http://diabetes.niddk.nih.gov/dm/pubs/riskfortype2/>. *Insulin resistance and pre-diabetes*. Available at: <http://diabetes.niddk.nih.gov/dm/pubs/insulinresistance/>. *What I need to know about gestational diabetes*. NIH Pub No. 04-5129. Available at: <http://diabetes.niddk.nih.gov/dm/pubs/gestational/#3>. Accessed May 28, 2004.

Research conducted to date has identified specific risk factors related to the development of type 2 diabetes, pre-diabetes, and gestational diabetes, including family history, a sedentary lifestyle, and overweight or obesity (Table 1). Maintaining a healthy weight as measured by body mass index (BMI) reduces one’s risk for developing type 2 diabetes, pre-diabetes, or gestational diabetes.²⁹ BMI is a measure of weight in relation to height (see Figure 3). Studies have shown that BMI is significantly correlated with body fat content for most adults. For adults, a BMI less than 25 is considered a healthy weight. Regular physical activity and eating a healthy diet can help attain and maintain a healthy weight.

²⁹National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). *National diabetes statistics*. NIH Publication No. 04-3892. Available at: <http://diabetes.niddk.nih.gov/dm/pubs/statistics/index.htm>. 2004; and Diabetes Prevention Program Research Group, op.cit.

Figure 3. Body Mass Index

Height in Feet and Inches	Weight in Pounds													
	120	130	140	150	160	170	180	190	200	210	220	230	240	250
4'6	29	31	34	36	39	41	43	46	48	51	53	55	58	60
4'8	27	29	31	34	36	38	40	43	45	47	49	52	54	56
4'10	25	27	29	31	33	36	38	40	42	44	46	48	50	52
5'0	23	25	27	29	31	33	35	37	39	41	43	45	47	49
5'2	22	24	26	27	29	31	33	35	37	38	40	42	44	46
5'4	21	22	24	26	27	29	31	33	34	36	38	39	41	43
5'6	19	21	23	24	26	27	29	31	32	34	36	37	39	40
5'8	18	20	21	23	24	26	27	29	30	32	33	35	36	38
5'10	17	19	20	22	23	24	26	27	29	30	32	33	34	36
6'0	16	18	19	20	22	23	24	26	27	28	30	31	33	34
6'2	15	17	18	19	21	22	23	24	26	27	28	30	31	32
6'4	15	16	17	18	19	21	22	23	24	26	27	28	29	30
6'6	14	15	16	17	18	20	21	22	23	24	25	27	28	29
6'8	13	14	15	16	18	19	20	21	22	23	24	25	26	27

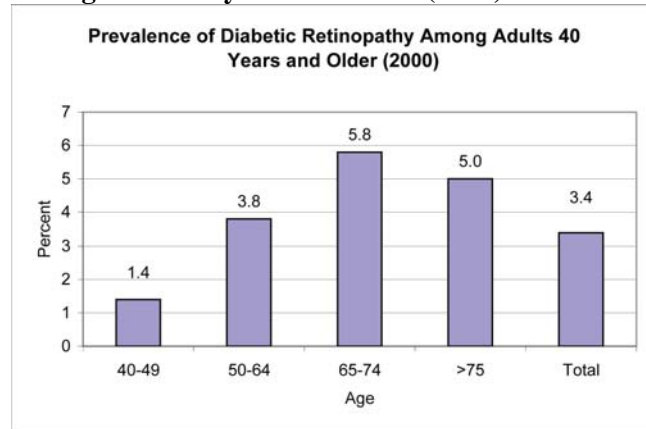
SOURCE: The Surgeon General’s Call to Action to Prevent and Decrease Overweight and Obesity 2001

Health Problems Related to Diabetes

Diabetes can have a significant impact on quality of life by increasing risk for a variety of complications. These include:

- **Blindness**—Diabetes is the leading cause of new cases of blindness among adults aged 20 to 74 years, with the greatest number in adults 65 years and older (Figure 4). Retinopathy causes 12,000 to 24,000 new cases of blindness each year in people with diabetes.³⁰

Figure 4. Prevalence of diabetic retinopathy among adults 40 years and older (2000)

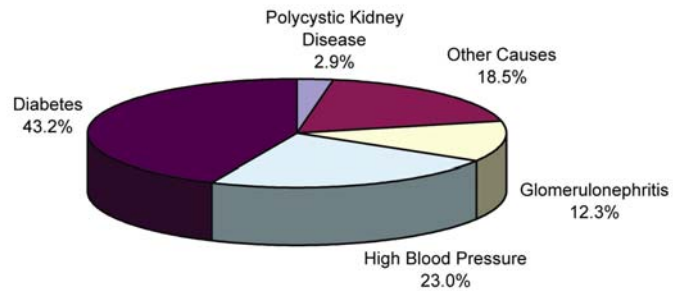


SOURCE: National Institutes of Health, National Eye Institute data from Prevalence and Causes of Visual Impairment and Blindness Among Adults 40 Years and Older in the United States, <http://www.nei.nih.gov/eyedata/>.

³⁰ CDC, National diabetes fact sheet, op.cit.

- **Kidney Disease**—Diabetes is the leading cause of end-stage kidney disease, accounting for 43 percent of new cases each year (Figure 5).³¹ In 2001, nearly 43,000 people with diabetes began treatment for end-stage kidney disease and approximately 143,000 people with end-stage kidney disease were living on chronic dialysis or with a kidney transplant due to diabetes.³² The rate of diabetic end-stage kidney disease is 2.6 times higher among Blacks than among Whites.³³

Figure 5. Primary causes for kidney failure (1998)

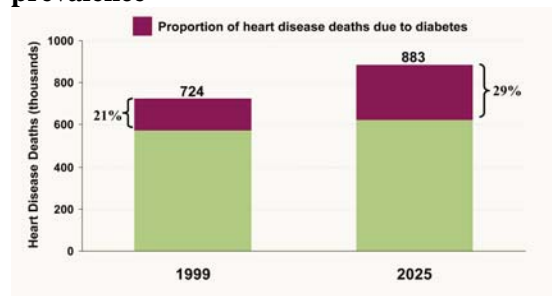


SOURCE: National Institute of Diabetes and Digestive Kidney Diseases (1998). Accessed at <http://kidney.niddk.nih.gov/kudiseases/pubs/kdd/index.htm>.

Glomerulonephritis is a variety of kidney disease characterized by inflammation of the capillaries.

- **High Blood Pressure**—About 73 percent of adults with diabetes have blood pressure greater than or equal to 140/90 mm Hg or use prescription medications for hypertension.³⁴
- **Heart Disease and Stroke**—About 65 percent of deaths among people with diabetes are due to heart disease and stroke.³⁵ Adults with diabetes have heart disease death rates about two to four times higher than adults without diabetes. It is projected that in the year 2025, twenty-nine percent of all heart disease deaths will be due

Figure 6. Projected increase in total heart disease deaths related to increased diabetes prevalence



SOURCE: Unpublished estimates from the National Heart, Lung and Blood Institute, October 18, 2002.

³¹ *ibid.*

³² *ibid.*

³³ AHRQ, *op.cit.*

³⁴ CDC, National diabetes fact sheet, *op.cit.*

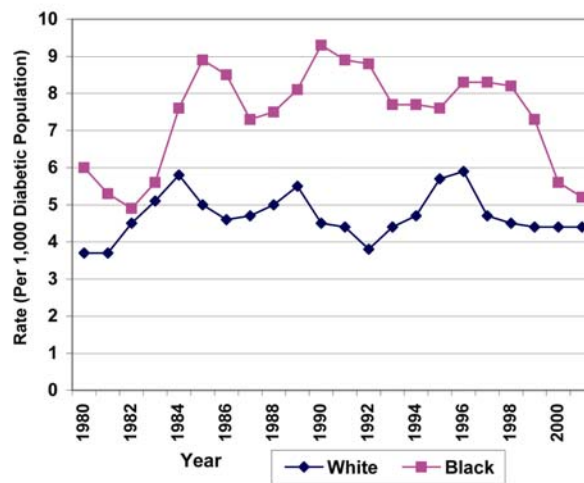
³⁵ *ibid.*

to diabetes (Figure 6). The risk for stroke is two to four times higher among people with diabetes.

- **Nervous System Disease**—About 60 to 70 percent of people with diabetes have mild to severe forms of nervous system damage including impaired sensation or pain in the feet or hands, carpal tunnel syndrome, slowed digestion of food in the stomach, and other nerve problems.³⁶ Severe forms of nerve disease are a major contributing cause of lower-extremity amputations for people with diabetes.
- **Dental Disease**—Gum disease is more common among people with diabetes. Among young adults, those with diabetes have about twice the risk of developing gum disease as those without diabetes. Almost one third of people with diabetes have severe gum diseases.

- **Amputations**—More than 60 percent of nontraumatic lower-limb amputations occur among people with diabetes.³⁷ In 2000–2001, about 82,000 nontraumatic lower-limb amputations were performed annually among people with diabetes.³⁸ Blacks have higher rates of lower extremity amputations than Whites (see Figure 7).³⁹

Figure 7. Age-standardized Rate of Hospital Discharge for Non-traumatic Lower Extremity Amputation per 1,000 Diabetic Population, by Race, United States, 1980-2001



SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, Division of Health Care Statistics, data from the National Hospital Discharge Survey and Division of Health Interview Statistics, data from the National Health Interview Survey.

U.S. Bureau of the Census, census of the population and population estimates and Centers for Disease Control and Prevention, National Center for Health Statistics, bridged-race population estimates.

- **Pregnancy Complications**—Poorly controlled diabetes before conception and during the first

³⁶ *ibid.*

³⁷ *ibid.*

³⁸ *ibid.*

³⁹ AHRQ, *op.cit.*

trimester of pregnancy can cause major birth defects in 5 percent to 10 percent of pregnancies and spontaneous abortions in 15 percent to 20 percent of pregnancies.⁴⁰ Poorly controlled diabetes during the second and third trimesters of pregnancy can result in very large babies, posing a risk to the mother and the child during delivery.

- **Other Complications**—People with diabetes are more susceptible to many other illnesses and often have worse outcomes. For example, people with diabetes are more likely to die from pneumonia or the flu than people who do not have diabetes.⁴¹

Early and optimal treatment is key to prevent or delay such complications.

Diabetes: A National Plan for Action

Secretary of Health and Human Services (HHS) Tommy G. Thompson has identified diabetes prevention, detection, and treatment as important components of his health agenda. Activities supporting the Secretary’s focus on diabetes include *Steps to a HealthierUS: Putting Prevention First* (Appendix A), the *Diabetes Detection Initiative*, and the *Small Steps, Big Rewards, Prevent Type 2 Diabetes* campaign. In addition, the Medicare Prescription Drug, Improvement, and Modernization Act (MMA) of 2003, establishes coverage of a one-time “Welcome to Medicare Physical Examination” within 6 months of a beneficiary’s first coverage under Part B to encourage health promotion and disease detection. The MMA also adds coverage for cardiovascular and diabetes screening for Medicare beneficiaries. Both benefits take effect January 1, 2005. More information on MMA and Medicare benefits in general can be found at <http://www.medicare.gov/> or 1-800-Medicare (1-800-633-4227). Appendix B provides additional information on diabetes benefits offered through Medicare.

Diabetes: A National Plan for Action (hereby referred to as the National Diabetes Action Plan—NDAP) is the latest initiative to address diabetes. This action plan was prompted by the Secretary’s commitment to disease prevention and health promotion. It utilizes a comprehensive action-oriented approach to identify activities to improve diabetes prevention, detection, and care.

The goals of the NDAP are to:

- Increase national awareness of diabetes, its impact, and what various stakeholders can do to prevent or manage the disease;

⁴⁰ CDC, National diabetes fact sheet, op.cit.

⁴¹ *ibid.*

- Reduce the prevalence of diabetes and factors that increase the risk of diabetes;
- Promote improved detection, monitoring, and treatment of the disease; and
- Identify existing public and private efforts to facilitate coordination and to leverage existing resources for detection, prevention, and treatment of diabetes.

An advisory committee composed of senior officials within the U.S. Department of Health and Human Services (HHS) was named to direct the development of the NDAP. This committee provided recommendations to reduce the prevalence and burden of diabetes. In addition, the Secretary and his senior staff hosted several town hall “listening sessions” in different parts of the country to highlight the important steps that individuals, health care practitioners and providers, businesses, and communities can and are taking to prevent, detect, and treat diabetes and educate patients, their families, and other Americans. The first town hall meeting focused on prevention of diabetes and was held in Cincinnati, Ohio, on March 29, 2004. The second town hall focused on diabetes detection and education and was held in Little Rock, Arkansas, on June 18, 2004. The third town hall focused on diabetes treatment and was held in Seattle, Washington, on July 26, 2004. In all, more than 1,200 people attended the three town halls.

During the public comment period at these town hall meetings, individuals and those representing organizations were able to ask questions, express their views, and provide input to the national diabetes action plan. Hundreds of people shared their thoughts about the burden of diabetes and solutions for preventing or delaying the disease and its complications. The public comment period identified issues of concern to the diabetes community. These included:

- The key role that schools and teachers can play in educating students and parents about the importance of healthy behaviors (i.e. physical activity, nutrition) to reduce their risk for diabetes;
- The important role health insurance plays in the ability of people with diabetes to manage their diabetes and the need for policymakers to continue to strive to improve the health insurance system for people with diabetes and other chronic conditions;
- The need to educate and train healthcare providers in state-of-the art diabetes prevention, detection, and management strategies;
- The importance of continued research into effective and innovative prevention strategies and treatments for diabetes; and

- The need for focused prevention, detection, and treatment efforts targeted specifically to individuals at higher risk for diabetes, including Blacks, Hispanics, American Indians, Alaskan Natives, Asians and Pacific Islanders using culturally sensitive materials and messages emphasizing the importance of early detection and optimal treatment.

See Appendix C for more information on the development of the NDAP.

The remainder of this document is organized around three key components: prevention, detection, and treatment of diabetes. Within each component, action steps are provided for individuals, friends and family, health care providers, schools, the media, community organizations, health insurance providers, employers, and government agencies to improve the quality of life for people living with diabetes and reduce the burden of diabetes on the nation.

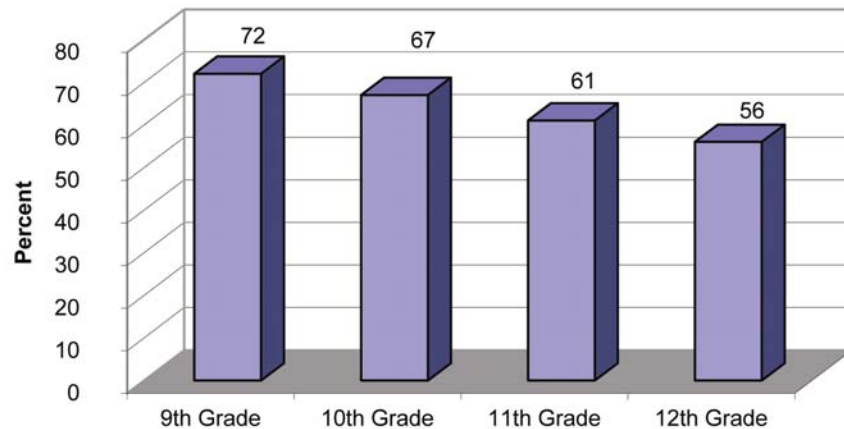
PREVENTION

Importance of Diabetes Prevention

The causes of type 1 diabetes are under investigation, and researchers are working to learn how to prevent the disease. While the causes of type 2 diabetes are not well understood, recent research has demonstrated that it often can be prevented or delayed through lifestyle changes in at risk persons.⁴² This section focuses on the prevention of type 2 diabetes. The “Treatment” section within this document addresses the prevention of medical complications caused by diabetes.

The prevalence of diagnosed type 2 diabetes increased six-fold in the latter half of the past century.⁴³ Obesity and physical inactivity have played a major role in this dramatic increase in rates of type 2 diabetes.⁴⁴ For example, until recently type 2 diabetes was not frequently seen in school-aged children and adolescents. Now the prevalence of type 2 diabetes for persons 20 and under appears to be rising considerably, and this rise can be attributed to increases in physical inactivity and excess weight gain.⁴⁵ More than one-third of young people in grades 9-12 do not regularly engage in vigorous activity (Figure 8).⁴⁶

Figure 8. Vigorous physical activity in adolescents by grade level, 2001



SOURCE: Kann L, et al. (2000). Youth Risk Behavior Surveillance Survey – US 1999, in CDC Surveillance Survey. *MMWR*, 49(SS-5), 1-96.

⁴² Diabetes Prevention Program Research Group, op.cit.

⁴³ Centers for Disease Control and Prevention (CDC). (2001). *Diabetes: A serious public health problem*. Atlanta, GA: Department of Health and Human Services.

⁴⁴ CDC, op.cit., Promising practices in Chronic Disease.

⁴⁵ ibid.

⁴⁶ Kann L, et al. (2000). Youth Risk Behavior Surveillance Survey – US 1999, in CDC surveillance survey. *MMWR*, 49(SS-5), 1-96.

Vigorous activity is defined as sustained activity that results in a significant increase in heart and breathing rate.⁴⁷

The Diabetes Prevention Program (DPP)—a major clinical trial involving 3,234 people with impaired glucose tolerance, a condition that often precedes diabetes—demonstrated that some people at high risk for type 2 diabetes can prevent or delay the onset of the disease by losing 5 percent to 7 percent of their body weight and getting 30 minutes or more of physical activity at least 5 days per week.⁴⁸ In this study, the development of type 2 diabetes was reduced by 58 percent over a three-year period. This benefit was seen in participants of all ages and racial and ethnic backgrounds. The very encouraging results of this trial show that it is *possible* to prevent or delay type 2 diabetes in high-risk persons.

It is not easy for many people to lose weight and increase their physical activity. However, it is imperative to build upon the results of the DPP and encourage people to take the necessary steps to prevent type 2 diabetes. This not only will help many Americans live healthier, more productive lives, but it also has the potential to save billions of dollars in health care costs associated with hospitalizations for diabetes and its complications. Friends, families, schools, health care providers, work sites and communities all can contribute in important ways to support healthier lifestyles.

Action Steps for Prevention

Individuals

Americans at risk for type 2 diabetes (please see Appendix D—Are You At Risk For Diabetes?) can take important steps to prevent or delay the disease by losing a small amount of weight by eating a reduced fat, low-calorie diet and increasing their physical activity. The goal is to eat fewer calories and increase physical activity to lose a small amount of weight.⁴⁹ The following action steps help people lower their risk for type 2 diabetes and other chronic diseases. Other helpful tips can be found at <http://www.smallstep.gov/> and <http://www.nal.usda.gov/fnic/dga/dguide95.html>.

- Eat a variety of foods within the basic food groups (fruits, vegetables, grains, milk, and meat and beans).

⁴⁷ Centers for Disease Control and Prevention (CDC). *Physical Activity Terms*. Available at: <http://www.cdc.gov/nccdphp/dnpa/physical/terms/index.htm#Vigorous>. Accessed September 15, 2004.

⁴⁸ Diabetes Prevention Program Research Group, op.cit.

⁴⁹ U.S. Department of Agriculture and U.S. Department of Health and Human Services. (1995). 4th ed. *Nutrition for your health: dietary guidelines for Americans*. Available at: <http://www.nal.usda.gov/fnic/dga/dguide95.html>.

- Choose a diet low in fats (not recommended for children 2 years old and under), saturated fats, and cholesterol; and use sugar and alcohol in moderation.⁵⁰
- Order healthier food choices or split a meal with a friend or ask the server to put half of it in a take home box when dining out.
- Use a salad plate for meals, rather than a full-size dinner plate, to make the meal appear larger.
- Learn to use the food label to determine the size or amount of a portion or serving of foods and beverages. Consume appropriate portions of foods and beverages.
- Drink a big glass of water or low-calorie beverage before a meal to help curb your hunger.
- Drink plenty of water throughout the day.
- Bake or broil foods rather than fry.
- Drink 2 percent or 1 percent milk rather than whole milk.
- Request a low-fat dressing for your salad.
- Keep a daily record of eating habits, noting type of food, amount, and time of day. Determine times where overeating occurs and develop a plan to help avoid these situations in the future.
- Find ways other than eating to deal with stress. Take a walk, stretch or take slow deep breaths.
- Be “snackwise.” Have a piece of fruit or some reduced-fat popcorn instead of reaching for a piece of cake.
- Make small nutritional changes. Some people find they are able to lose weight by simply eliminating sugary drinks.
- Try some new recipes for healthier foods, such as those suggested by the American Diabetes Association (<http://www.diabetes.org>) or the American Heart Association (<http://www.americanheart.org>).
- Make regular physical activity an essential part of daily activities.
- Exercise while watching TV by running or marching in place to avoid being a “couch potato.” Put away the remote and get up to change the channel on the TV.
- Find an enjoyable exercise or physical activity and get active. For example, for those who enjoy dancing, put on some music and dance each day.
- Take the stairs instead of elevators and escalators.
- Park farther away from stores, or ride a bicycle or walk to stores.
- Walk inside a mall as an inexpensive way to exercise in a sheltered space.
- Volunteer to walk dogs at the local animal shelter or for an elderly neighbor.

⁵⁰ *ibid.*

- Ask friends or use the Internet to find out about local parks or other facilities where you can exercise.
- Set personal goals for exercise and track progress. For example, if a goal is to walk at least 30 minutes five times a week, keep a record of how many times the goal was met. If a day is missed, record it and indicate why it was missed. At the end of the week, consider what changes to make so that the goals for the following week will be met. Some people find it helpful to begin with smaller, easier-to-reach goals.

Families and Friends

One of the best ways to build exercise and healthy eating into daily activities is to do it with others, including family and friends. Here are some suggestions:

- Parents can exercise with their children. Be a role model for them. Walking together has the added benefit of providing a regular opportunity to talk with them.
- Parents can model good eating habits for their children by eating a diet that includes plenty of whole grain products, vegetables, and fruits, and is low in fats, saturated fats, and cholesterol, and limiting portion sizes.
- Caregivers should promote physical activity and good eating habits for older family members.
- Walk the dog. Make walking the dog a regular family activity. The dog will appreciate it.
- Give pedometers to family or friends to help make exercise fun.
- Support the exercise habits of family members, including older adults. Look for ways to help them fit exercise into their schedules.
- Offer to bring fresh fruit as a dessert rather than cake or cookies when going to a friend or family's house for a meal.

Schools

The increase in type 2 diabetes among children makes schools essential partners in preventing the disease. Some specific activities for schools and teachers to consider include:

- Educate and share health promotion messages about sound nutrition and regular physical activity with teachers, school nurses, students, and parents.
- Educate children about the importance of balanced nutrition and regular exercise in preventing diabetes.
- Encourage children to develop plans for better nutrition and exercise and ways to measure their progress.
- Engage parents to increase their understanding of the importance of healthier diets and the benefits of exercise.
- Offer regular physical education/gym classes.

- Provide opportunities for unstructured activities for all ages at lunch and during breaks. For elementary school children, this might include actively participating in physical activities on the playground. For older students, sports equipment can be provided (e.g., basketballs, tennis rackets, etc.), with coaches encouraging participation in activities.
- Provide opportunities for nontraditional sports and alternatives to team sports for students who may not have the same physical talents as their peers.
- Provide after-school activities through the school or in partnership with other organizations, such as city parks and recreation leagues, religious organizations, community YMCAs, or Boys and Girls Clubs.
- Provide tasty food options that are low in saturated fats and include fruits, vegetables, nuts, and whole grains for cafeteria and food cart choices.
- Provide healthy alternatives, such as milk, low-calorie beverages, or water in vending machines and in the cafeteria.
- Solicit help from school staff in setting examples for healthier eating and increased exercise.
- Foster the benefits of exercise through fun competitions and activities. For example, sponsor contests among teacher and student groups to register the most steps on their pedometers.
- Encourage all students to participate in exercise and support each other regardless of different abilities.
- Partner with State Diabetes Prevention and Control Programs run by the State Health Department.

Health Care Providers

Health care providers play a key role in the prevention of type 2 diabetes. Research shows that medical providers are among the most important health messengers and that patients are more likely to adopt new behaviors when instructed to do so by their health practitioners.⁵¹ Providers can take the following steps to encourage healthy behaviors among their patients:

- Counsel patients with pre-diabetes about their risk of developing diabetes and develop a concrete plan for patients to help them decrease the likelihood of developing the disease.
- Refer high-risk individuals to appropriate resources for nutrition counseling and pre-diabetes education.
- Screen for overweight and obesity. Counsel patients who are overweight to lose weight. Set reasonable weight loss goals to avoid failure and frustration.

⁵¹ Logsdon DN, Lazaro CM, Meier RV. (1998). The feasibility of behavioral risk reduction in primary medical care. *Am J Prev Med*, 5(5), 249-256; and Inui TS, Yourtee EL, Williamson JW. (1976). Improved outcomes in hypertension after physician tutorials: A controlled trial. *Ann Intern Med*, 84(6), 646-651.

- Refer patients to local resources or services that offer weight loss and physical activity programs and/or provide tools to help patients make lifestyle changes, activity logs, or meal plan guides.⁵²
- Provide information (e.g., handouts) on safe approaches to weight loss. Ready-to-use materials are available free of charge for providers through resources such as “Your Game Plan for Preventing Type 2 Diabetes: Health Care Provider’s Toolkit” (http://www.ndep.nih.gov/diabetes/pubs/GP_Toolkit.pdf).
- Encourage patients whose health permits to begin an exercise plan. Emphasize that even small steps can produce big rewards.
- Help patients set reasonable and realistic long-term and short-term exercise goals that can be measured over time so that they can see their successes.
- Build in accountability for patients. For example, after delivering the initial prevention messages and working with patients to set realistic goals, set up a reminder or follow-up system with patients who have been counseled to lose weight to assess progress and offer motivational messages.
- Acknowledge patients’ efforts to adopt healthier behaviors, even if the initial changes reflect only part of the change needed.
- Encourage lifestyle changes for youth and counsel their parents on the importance of exercise and healthy eating to help prevent type 2 diabetes.⁵³
- Work with State Diabetes Prevention and Control Programs run by the State Health Department.

Employers

Healthy employees are more productive and can be cost beneficial to companies. For example, a research study conducted on the return on investment (ROI) for worksite health promotion and disease prevention programs in nine companies, found significant ROI with the benefit to cost ratio ranging from \$1.49 to \$4.91 in benefits per dollar spent on the program.⁵⁴ The following are some suggested worksite actions for employers that can encourage healthy behaviors in their employees:

- Be creative about developing exercise options. For example, think outside the “conference room box” by encouraging employees to hold discussions while walking with their colleagues rather than sitting in a conference room.

⁵² The National Diabetes Education Program has developed tools to support providers in their efforts to encourage healthier lifestyle choices among their patients. These tools are available free of charge at <http://www.ndep.nih.gov/resources/health.htm>.

⁵³ Sinha R, Fisch G, Teague B, et al. (2002). Prevalence of impaired glucose tolerance among children and adolescents with marked obesity. *New England Journal of Medicine*, 346(11), 802-810.

⁵⁴ U.S. Department of Health and Human Services. Prevention makes common cents. (2003). Available at: <http://aspe.hhs.gov/health/prevention/>.

- Provide exercise space. For example, a conference room with a VCR player, a couple of low-impact aerobics tapes, and some low-cost mats made available at lunch time can serve as an exercise space for employees as well as a valuable networking activity that can improve morale and productivity.
- Provide healthy food options in cafeterias and vending machines to employees.
- Encourage employees to adopt healthy behaviors. For example, offer “contests” with prizes to encourage exercise for employees.
- Consider providing health promotion or wellness programs and disease management programs for employees as part of their health benefits.
- Provide on-site education about diabetes prevention to employees.
- Utilize resources that are readily available at no cost to employers, such as Diabetes at Work (<http://www.diabetesatwork.org/>).
- Consider partnering with the local YMCA or community health club to offer discounted memberships to employees and their families.
- Partner with community organizations to develop and implement community health promotion and disease prevention initiatives.
- Request health insurers to provide appropriate information for employees to educate them on their health and diabetes prevention.
- Provide employees information about local parks and walking trails.

Health Insurance Providers

Successful prevention initiatives can reduce the need for some costly medical services and treatment. Therefore, health insurance providers can also assist prevention efforts as follows:

- Educate patients and purchasers on the importance of prevention to reduce the risk for diabetes.
- Review preventive health benefits offered to purchasers.
- Partner with others working in diabetes prevention such as State Diabetes Prevention and Control Programs in State Health Departments.
- Develop creative prevention messages and programs that encourage patients to adopt healthy behaviors (i.e., eating healthy, regular exercise).
- Participate in research into effective preventive services and practices.

Communities

Local communities also play an important role in preventing or delaying type 2 diabetes by providing environments that promote healthier lifestyles through improved nutrition and increased physical activity. Civic and community organizations can partner with business groups, government agencies and others to encourage healthier eating and increased physical

activity for the community. Some actions communities can take to help prevent type 2 diabetes for their citizens include:

- Promote environments that foster fitness, such as walking trails. Marking sidewalks with distance markers and messages can help encourage exercise.
- Encourage a community culture that promotes healthier eating habits. For example, community groups can sponsor “cook-offs” to create healthy culinary options among local chefs.
- Create community vegetable gardens.
- Organize community activities, such as community block parties with dancing and healthy food choices.

Media

The media serve as important partners in promoting diabetes prevention messages. The following are steps that members of the media can take to help spread the word about how to prevent type 2 diabetes:

- Promote public awareness about the importance of diabetes prevention and the benefits of maintaining a healthy weight with regular physical activity and a healthy diet.
- Disseminate credible and accurate messages that encourage healthy habits and discourage risky behaviors. Media staff can help tailor messages to target specific audiences.
- Partner with medical professionals, federal, state, and local governments, and private-sector community entities to help the public understand the importance of preventing diabetes. Publicize providers who are doing a particularly good job in facilitating behavior change or a hospital that has opened its doors to run a no-cost exercise program in a low-income area.
- Conduct or participate in research to study the effectiveness of media messages promoting healthy lifestyles.
- Use public access networks to broadcast local conferences or training videos on diabetes prevention.

Researchers and Professional Educators

Researchers and professional educators also play important roles in diabetes prevention. The following are some general diabetes prevention steps these groups can take:

- Continue research into the causes of type 1 and type 2 diabetes.
- Continue applied research into the prevention of diabetes and other relevant issues such as cost benefit analysis and evidence-based prevention strategies for combating the disease.

- Continue to conduct clinical trials like the DPP to prevent the onset of type 2 diabetes in individuals at high risk for developing the disease, such as minority populations.
- Continue to develop effective methods to translate research findings into clinical practice to prevent diabetes.
- Develop useful outcome measures for health promotion and diabetes prevention activities, services, and practices to assess progress in these areas, and provide information to inform program improvement.
- Develop and evaluate innovative methods to inform people about the importance of diabetes prevention and the link between the risk for diabetes and personal behaviors and choices, such as physical activity and dietary choices.
- Develop partnerships with community organizations to promote research and educational initiatives regarding diabetes prevention.

State and Local, Federal, and Tribal Governments

The public sector plays an important role in (a) supporting healthy lifestyles among Americans that may prevent type 2 diabetes, (b) advancing research on how to prevent diabetes, and (c) supporting efforts to translate research to practice. Action steps that can be taken by state, federal, and tribal governments include the following:

- Review and design policies that optimize strategies to address diabetes at all stages.
- Partner with communities and other entities to create environments that encourage healthy lifestyles and habits (e.g., collaborate with communities to develop walking trails and parks where people can exercise safely) and implement initiatives.
- Disseminate information about the importance of healthy lifestyles to prevent diabetes. Tailor these messages to be meaningful to people of all ages, and cultural, socio-economic, ethnic, and racial backgrounds.
- Support research on the effectiveness of different interventions to prevent diabetes.
- Conduct surveillance activities to measure progress toward achieving public health goals.
- Create an evidence base of effective strategies for preventing diabetes.
- Intensify prevention efforts among Blacks, Hispanics, American Indians and Alaskan Natives, and other population groups who disproportionately suffer diabetes and its complications.⁵⁵
- Motivate government employees to adopt healthy lifestyles, thereby serving as a model to other employers.
- Foster interagency collaboration at federal, state, and tribal levels to promote healthy lifestyles in order to reduce the risks for diabetes.

⁵⁵ Centers for Disease Control and Prevention. (1991) *Diabetes surveillance system* Atlanta: US Department of Health and Human Services. Available at: <http://www.cdc.gov/diabetes/statistics/survl99/chap1/conclusion.htm>.

DETECTION

The Importance of Early Diabetes Detection

Approximately 5 million of the 18 million people with diabetes in the U.S. do not know they have it.⁵⁶ Early detection and treatment of diabetes is an important step toward keeping people with diabetes healthy. It can help to reduce the risk of serious complications such as premature heart disease and stroke, blindness, limb amputations, and kidney failure.⁵⁷

Some of the important signs and symptoms of diabetes are shown in Table 2. Many people with type 2 diabetes have no signs or symptoms, but do have risk factors (see Table 1). For persons at increased risk or those experiencing these signs and symptoms, several tests are used to diagnose diabetes:

- A fasting plasma glucose test measures blood glucose after not eating for at least 8 hours. This test is used to detect diabetes (126 mg/dl and above) or pre-diabetes (between 100 mg/dl and 125 mg/dl).⁵⁸
- An oral glucose tolerance test measures blood glucose after not eating for at least 8 hours and 2 hours after drinking a glucose-containing beverage. This test is used to diagnose diabetes (200 mg/dl and above) or pre-diabetes (between 140 mg/dl and 199 mg/dl).⁵⁹
- In a random plasma glucose test, blood glucose is checked without regard to when food is consumed. Values of 200 mg/dl or greater in the presence of specific symptoms, such as increased urination or thirst and unexplained weight loss, indicate a diagnosis of diabetes.⁶⁰

Positive test results should be confirmed by repeating the fasting plasma glucose test or the oral glucose tolerance test on a different day.

Type 1 diabetes is typically detected much sooner after onset than type 2 disease because the symptoms are dramatic and the need for medical care is immediate and obvious. In contrast, the signs and symptoms of type 2 diabetes can be absent or so mild that the disease may not be

⁵⁶ Williamson DF, Vinicor F, Bowman BA. (2004). Centers For Disease Control and Prevention Primary Prevention Working Group: Primary prevention of type 2 diabetes mellitus by lifestyle intervention: implications for health policy. *Ann Int Med*, 140(11), 951-957.

⁵⁷ U.S. Department of Health and Human Services (DHHS). *Diabetes detection initiative: Finding the undiagnosed*. Available at: <http://www.ndep.nih.gov/ddi/about/index.htm>.

⁵⁸ National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). (2003). *Diagnosis of diabetes*. NIH Pub No. 04-4642. Available at: <http://diabetes.niddk.nih.gov/dm/pubs/diagnosis/index.htm>.

⁵⁹ *ibid.*

⁶⁰ *ibid.*

diagnosed for 7 to 10 years after the onset resulting in increased risk for complications, such as nerve, eye, and kidney disease, when the disease is finally detected.⁶¹

Table 2. Signs and Symptoms of Diabetes

Symptoms	Type 1 Diabetes	Type 2 Diabetes
Frequent urination	X	X
Unusual thirst	X	X
Extreme hunger	X	X
Unusual weight loss	X	
Extreme fatigue	X	X
Sudden vision changes	X	X
Fruity, sweet, or wine-like odor on breath	X	
Heavy, labored breathing	X	
Stupor, unconsciousness	X	
Irritability	X	X
Frequent infections	X	X
Blurred vision	X	X
Cuts/bruises that are slow to heal	X	X
Recurring skin, gum, or bladder infections		X

SOURCES: National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). (2004). Am I at risk for type 2 diabetes? NIH Publication No. 04-4805. Available at <http://diabetes.niddk.nih.gov/dm/pubs/riskfortype2/>. Accessed May 28, 2004.

Juvenile Diabetes Research Foundation. Knowing the warning signs for type 1 diabetes could save a child's life. Available at http://www.jdrf.org/index.cfm?fuseaction=home.viewPageandpage_id=117E31FB-001E-A85D-3C71EBB8B19732AC. Accessed May 28, 2004.

In the past, type 2 diabetes was a disease seen primarily in adults over age 45 with the highest percentage occurring in adults 60 years and older.⁶² It is now being seen at increasingly younger ages, including children and adolescents.⁶³ As with adults, identifying type 2 diabetes in children is challenging because children may not have any symptoms or show only very mild symptoms. Diagnosis of type 2 diabetes in young people means that they may have the disease for a longer period time than if they developed diabetes as adults. The longer duration of the

⁶¹ DHHS, op.cit.

⁶² *ibid.*

⁶³ Centers for Disease Control and Prevention (CDC). (2000). *CDC funds registries for childhood diabetes*. Press release, November 21. Available at <http://www.cdc.gov/od/oc/media/pressrel/r2k1226.htm>.

disease increases the rate of severe complications such as blindness, renal failure, and amputations.⁶⁴

Early diagnosis of diabetes and pre-diabetes is important so that patients can begin to manage the disease early and potentially prevent or delay the serious disease complications that can decrease quality of life. Recognizing the importance of identifying the more than 5 million Americans with undiagnosed diabetes, Secretary Tommy G. Thompson launched the Diabetes Detection Initiative (DDI) in November 2003. The DDI is a new community-based effort to identify persons with undiagnosed type 2 diabetes and refer them for follow-up blood testing and treatment, if appropriate. The pilot program was evaluated in 10 locations throughout the U.S. (see Appendix C for more information on the DDI).

Action Steps for Detection

Knowledge of the risk factors, and signs and symptoms of diabetes and pre-diabetes may help increase awareness about the need to be tested for diabetes. Individuals, family members, friends, health care providers, schools, the media, community organizations, health insurance providers, employers, as well as local, state, and federal governments all play important roles in helping to ensure that at-risk or asymptomatic individuals are screened for diabetes.⁶⁵

Individuals and Family and Friends

People at risk for diabetes and their family and friends can be actively involved in ensuring that diabetes is diagnosed early. Individuals may be able to recognize diabetes symptoms for themselves, or a friend or family member may recognize these symptoms in a loved one and encourage that person to get tested for diabetes. The following are some steps that can help to identify people at risk for diabetes:

- Take a self-administered type 2 diabetes risk assessment test (see Appendix D) to determine individual risk for diabetes and important next steps. Discuss the results with a health care provider.
- Pregnant women should ask their health care provider if a diabetes test is needed.
- Individuals with pre-diabetes should work with their health care provider to develop a plan to help delay or prevent the onset of type 2 diabetes. Even if blood glucose levels do not indicate diabetes, pre-diabetes is a risk factor for developing diabetes. Losing a

⁶⁴ *ibid.*

⁶⁵The USPSTF concludes that the evidence is insufficient to recommend for or against routinely screening asymptomatic adults for type 2 diabetes, impaired glucose tolerance, or impaired fasting glucose. The USPSTF does recommend screening for type 2 diabetes in adults with hypertension or hyperlipidemia (see <http://www.ahrq.gov/clinic/uspstf/uspsdiab.htm>. for more information). The generally accepted standards of care for diabetes screening can be found at: http://care.diabetesjournals.org/cgi/content/full/27/suppl_1/s11#SEC3

- small amount of weight by eating a healthier diet and getting regular exercise may prevent or delay the onset of type 2 diabetes.
- Encourage family members and friends with diabetes symptoms to seek medical help. Talk with a health care provider or local office of the American Diabetes Association to learn how to support someone who may be at risk for diabetes.

Schools

School personnel play an important role in identifying children with type 1 and type 2 diabetes. Specific actions schools can take to help in diabetes detection include:

- Educate teachers and school nurses about the signs, symptoms, and risk factors of diabetes and encourage them to report concerns about students to parents or the appropriate school officials. Diabetes education information can be found at <http://www.ndep.nih.gov>.
- Educate parents and children about diabetes, for example, by sending information home with report cards about how the number of children with type 2 diabetes is increasing, and providing information about diabetes risk factors and signs and symptoms to look for in children or by providing diabetes and health education information during parent teacher meetings.
- Partner with local and state health departments and/or organizations, such as the American Diabetes Association, to support diabetes awareness activities in schools.

Health Care Providers

Different types of medical providers, such as doctors, physicians' assistants, nurse practitioners, nurses, diabetes educators, registered dietitians, and pharmacists can play critical roles in helping to detect diabetes. Here are some things providers can do:

- Gain and maintain state-of-the-art knowledge about the risk factors for diabetes and pre-diabetes and effective strategies related to testing for and diagnosing the disease. For example, the diagnostic glucose numbers for diabetes and pre-diabetes have been revised in the past few years (See "The Importance of Early Diabetes Detection" in this section for current diagnostic glucose numbers).
- Create opportunities within the health care setting to identify persons at high risk for diabetes, such as asking patients to provide information about diabetes symptoms and risk factors on a pre-visit questionnaire. Knowing a patient has symptoms or risk factors for diabetes can serve as an important prompt for diagnostic testing.
- Assess risk for gestational diabetes. The American College of Obstetricians and Gynecologists (ACOG) advises that it is appropriate to screen all pregnant women for gestational diabetes, whether by patient history, clinical risk factors for gestational diabetes, or a laboratory test to determine blood glucose levels. However, ACOG acknowledges that more research is needed before it can be determined what

screening method is best and when it should occur.⁶⁶ The U.S. Preventive Services Task Force concludes that evidence is insufficient for or against routine screening for gestational diabetes.⁶⁷

- Establish and implement protocols to ensure that newly diagnosed patients with diabetes are (1) promptly educated about lifestyle changes and diabetes self-management techniques that can delay or prevent complications of diabetes; (2) tested when appropriate for comorbid conditions, such as eye or cardiovascular disease; and (3) involved in developing a plan to control HbA_{1c}, blood pressure, and cholesterol, the “ABCs of diabetes.”⁶⁸
- Refer patients and provide contact information as needed to additional health care providers to address specific or urgent problems.
- Be a diabetes messenger and help to educate patients and community members about the risk factors and signs and symptoms of diabetes and encourage behavior change. Share information about diabetes detection with community leaders.
- Become involved in research aimed at identifying effective approaches to detect diabetes in various populations, such as children, older persons, and members of specific racial/ethnic groups.

Employers

Employers can play a key role in educating their employees about the risk for diabetes and encouraging them to be screened and/or tested for the disease. By working with the National Diabetes Education Program,⁶⁹ some employers have become the central nexus for improved detection:

- Distribute information about diabetes and its risk factors and signs and symptoms to employees and their families.
- Partner with the health department or other local organizations to provide work-site diabetes screening and strongly encourage individuals who indicate a high risk for diabetes to be tested for the disease.

⁶⁶ American College of Gynecologists. (2001). *Pregnant women should be screened for gestational diabetes: Though no one test is ideal*. Press release, August 31. Available at: http://www.acog.org/from_home/publications/press_releases/nr08-31-01.cfm. August 31, 2001.

⁶⁷ U.S. Preventive Services Task Force. *Screening for gestational diabetes mellitus: Recommendations and rationale*. (February 2003). Agency for Healthcare Research and Quality, Rockville, MD. Available at <http://www.ahrq.gov/clinic/3rduspstf/gdm/gdmrr.htm>.

⁶⁸ National Diabetes Education Program. *Guiding principles for diabetes care: For health care providers*. NIH Publication No. 99-4343. Available at: http://www.ndep.nih.gov/diabetes/pubs/GuidPrin_HC_Eng.pdf.

⁶⁹ The National Diabetes Education Program is a jointly funded program by the National Institutes of Health and the Centers for Disease Control and Prevention and includes over 200 partners at the federal, state, and local levels, working together to reduce morbidity and mortality associated with diabetes.

Health Insurance Providers

Health insurance organizations can also support early detection of diabetes through education and outreach efforts to their members. Early identification of diabetes can help improve quality of life and avoid costly complications. Health plans may also consider giving diabetes screening and testing guidelines to providers. Potential steps health insurance providers can take include:

- Educate members about the risk factors and signs and symptoms for diabetes and offer incentives to at-risk patients to be tested for diabetes.
- Inform pregnant women about the potential value of screening for gestational diabetes.
- Consider offering incentives to health care providers to follow evidence-based diabetes diagnostic guidelines.
- Provide information to assist providers in reaching racial and ethnic groups that are disproportionately affected by diabetes.
- Provide culturally sensitive messages that are targeted to racial and ethnic populations at higher risk for diabetes.

Communities and Local Health Departments

Community organizations and local health departments can play an important role in diabetes education and detection. Various local organizations (e.g., federally supported health centers, the local chapter of the American Diabetes Association, faith-based organizations, etc.) along with the local health department may be valuable resources to help develop and/or distribute information on the importance of early diabetes detection and the risk factors for and signs and symptoms of diabetes. Some action steps for community organizations include:

- Encourage local organizations to disseminate information, such as copies of diabetes risk assessment tests, through their various communication channels. Examples of potential partnerships include vendors placing diabetes information on shopping bags; local utility companies including inserts into mailings; and churches, synagogues, and other faith-based organizations placing diabetes risk assessment tests in their newsletters, bulletins, or other mailings.
- Organize outreach sessions at community venues such as libraries that can provide space, equipment, and other resources for community-wide presentations on diabetes detection, including risk factors, signs and symptoms, and action steps for individuals who think they might have the disease.
- Develop a directory of community resources for diabetes screening, testing, and treatment that can be distributed to people at high risk for diabetes.

Media

The media can make an important contribution to early detection of diabetes by helping to educate the public about the risk factors and signs and symptoms of diabetes and encouraging those with risk factors and signs and symptoms to discuss testing with their health care providers. Specific functions the media can perform to enhance diabetes detection include:

- Increase diabetes awareness through responsible reporting about the risk factors and signs and symptoms of diabetes.
- Provide information about the risk factors for diabetes and make people aware that many people with diabetes may not have signs or symptoms.
- Promote health messages that emphasize the importance of early diabetes detection to improve health outcomes and avoid diabetes complications.
- Promote National Diabetes Alert Day (the fourth Thursday in March) on national, state, and local levels.
- Utilize resources that are readily available at no cost, such as information about the Diabetes Detection Initiative (<http://www.ndep.nih.gov/ddi/index.htm>).
- Partner with medical professionals, federal, state, and local governments, and private-sector community entities to develop effective health messages that will generate public interest and increase public understanding of the importance of detecting diabetes.
- Participate with public health researchers to develop appropriate, targeted, and effective media messages to reach people at risk for diabetes, particularly older adults and at-risk racial and ethnic populations.
- Provide tailored messages targeting specific racial and ethnic populations at higher risk for diabetes.
- Work with officials to encourage public access networks to broadcast local conferences or training videos on diabetes detection.
- Work with local professional organizations to identify and acknowledge health care providers who have excelled in diabetes detection efforts.
- Recognize local, state, and national programs that have been successful in detecting diabetes and decreasing the proportion of Americans with undiagnosed diabetes.

State, Tribal, and Federal Governments

At the state and national levels, government organizations and others are working to improve diabetes detection. Appendix C describes several important ongoing governmental activities for diabetes detection. Other examples of specific action steps include:

- Review and design policies that optimize strategies to address diabetes detection.

- Create an evidence base of best strategies for detecting diabetes that includes screening protocols for both diabetes and pre-diabetes.
- Acknowledge community efforts that have effectively increased the percentage of persons diagnosed with diabetes.
- Educate elected officials about how early detection can help improve overall quality of life for constituencies and the implications for reducing health care costs.
- Provide important information about population groups, such as older adults and at-risk racial and ethnic populations, and people with certain risk factors, including obesity, that make them more likely to have diabetes and thus have a greater need for screening.
- Identify trends in new cases of type 1 diabetes, type 2 diabetes, gestational diabetes, and pre-diabetes to inform diabetes detection activities.
- Create culturally sensitive diabetes awareness messages targeted to underserved populations that are at high risk for diabetes.
- Examine health insurance coverage policy for public employees with respect to diabetes testing.

TREATMENT

The Importance of Diabetes Treatment and Management

If left untreated or undertreated, diabetes can cause severe complications that can damage many vital organs in the body and lead to premature death.⁷⁰ Possible complications from diabetes can include heart disease, blindness, lower extremity amputations, kidney failure, dental disease, and increased susceptibility to infections. Estimates suggest that in many states, half of all people with diabetes do not receive recommended preventive care services that are known to reduce the risk of diabetes complications.⁷¹

The good news is that the complications from diabetes can often be prevented or delayed with quality medical care and by adopting healthy behaviors to manage diabetes. For example, the Diabetes Control and Complications Trial (DCCT) demonstrated that careful control of blood glucose levels resulted in delaying the onset and slowing the progression of retinopathy (eye disease), nephropathy (kidney disease), and neuropathy (nerve disorders) for people with type 1 diabetes.⁷² Other studies such as the U.K. Prospective Diabetes Study (UKPDS)⁷³ have shown similar dramatic reductions in complications with control of blood glucose for people with type 2 diabetes. Empowering people with diabetes with knowledge and resources to proactively manage their disease and prevent or control diabetes complications is an important step in successful disease management. Friends and family members, health care professionals, schools, employers, health insurance providers, community organizations, the public media, and government agencies can all help persons with diabetes to live healthy and productive lives. This section suggests action steps to improve diabetes management and decrease risks for diabetes complications.

Action Steps for Treatment

Individuals

The possible complications from diabetes can be extremely serious. There is strong evidence from clinical trials that many of these complications may be delayed or prevented by

⁷⁰ CDC, National Diabetes Fact Sheet, op.cit.

⁷¹ Centers for Disease Control and Prevention (CDC). Levels of Diabetes-related preventive-care practices-United States, 1997-1999. *MMWR Morbidity Mortality Weekly Report* 2000; 49(42), 954-958.

⁷² The Diabetes Control and Complications Trial Research Group, op.cit; and Diabetes Complications, National Diabetes Information Clearing House. Available at <http://diabetes.niddk.nih.gov/complications/>. Accessed on September 7, 2004.

⁷³ Turner, RC, op.cit.

carefully controlling blood glucose levels, blood pressure, and LDL cholesterol levels.⁷⁴ To help manage diabetes, individuals should discuss, create, and follow a diabetes management plan with a health care provider and set goals for a treatment plan. The following are some specific suggestions to consider:

- Ask health care providers about the ABCs of diabetes. “A” is HbA_{1c}, a measure of average blood glucose; “B” is blood pressure; and “C” is LDL-cholesterol. Patients should determine what their levels are, what they should be, and what steps they can take to reach those goals.⁷⁵
- Work with health care providers to establish and maintain individualized target blood glucose levels. Ask how often and when to measure blood glucose levels. Individuals should keep a record of blood glucose readings to show their health care provider so they can better regulate their blood glucose.
- Be aware of the symptoms for hypoglycemia (low blood sugar) and hyperglycemia (high blood sugar). Individuals who experience these symptoms, should adjust their treatment plan and seek medical advice on how to maintain healthy blood glucose levels. Table 3 presents symptoms of hypoglycemia and hyperglycemia.

Table 3. Symptoms of Hypoglycemia and Hyperglycemia

<p>Symptoms of hypoglycemia</p> <ul style="list-style-type: none">▪ Feel weak, confused, irritable, hungry, or tired▪ Sweat a lot or get a headache▪ Feel shaky <p>Symptoms of hyperglycemia</p> <ul style="list-style-type: none">▪ Feel very thirsty and tired▪ Have blurry vision▪ Have to go to the bathroom often▪ Nausea

SOURCE: National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). *Your guide to diabetes—type 1 and type 2*. Available at: <http://diabetes.niddk.nih.gov/dm/pubs/type1and2/lowglucose.htm>.

Hypoglycemia is a low blood sugar. Hyperglycemia is a high blood sugar.

⁷⁴ The Diabetes Control and Complications Trial Research Group, op.cit; and Turner, RC, op.cit

⁷⁵ The ABCs of Diabetes refers to knowing the patient’s blood glucose level through the HbA_{1c} test and making sure blood pressure and cholesterol are at recommended levels. Information on “Knowing your ABCs” can be found at: <http://www.ndep.nih.gov/diabetes/control/4Steps.htm#Step2>.

- Follow a meal plan developed with a health care provider. This can be an important step for maintaining desirable blood glucose levels and avoiding complications.
- Work with a health care provider to develop an appropriate exercise program and follow this plan. Appropriate exercise can be important for people with diabetes because it can help insulin work better to lower blood glucose levels and improve cardiovascular health.
- Follow a health care provider's recommendations for how and when to take diabetes medications. Discuss with a health care provider if medications do not seem to be working properly.
- Individuals should ask their primary care provider about a dilated eye exam at least once a year as people with diabetes are at higher risk for vision problems and blindness. Early detection and treatment of diabetic eye disease can prevent or delay vision loss.
- Request regular blood pressure checks at every medical visit and cholesterol checks at least once per year because people with diabetes are at higher risk for heart disease and stroke. Lowering blood pressure and cholesterol can reduce the risk of heart attack and stroke, the major cause of death in people with diabetes.
- Individuals, who smoke cigarettes, should seek help from a health care provider to quit smoking to further reduce their risk for heart disease.
- Brush teeth regularly and visit a dentist at least once every six months because people with diabetes are at higher risk for gum disease.
- Check feet for sores and calluses every day, wear shoes that fit properly, and get a comprehensive foot exam at least once per year with a health care professional since people with diabetes are at a higher risk for foot problems that can be caused by neuropathy (nerve damage) or poor blood flow to the feet.
- Ask for a urine test by a health professional at least once a year to monitor the level of protein in urine, a measure of kidney function.
- If planning a pregnancy, consult a health care provider to make a care plan that focuses on good blood glucose control before and during the pregnancy.
- Maintain records of daily self-management activities and medical visits. The checklist in Table 4 can help individuals and healthcare providers keep track of diabetes care. Other materials for managing diabetes can be found at <http://www.ndep.nih.gov/diabetes/control/control.htm> or by calling 1-800-860-8747.
- Ask a health care provider about new medicines and medical devices, such as blood glucose meters and insulin pens and pumps that could help manage diabetes.
- Seek the help of qualified health care professionals—such as a primary care provider, an endocrinologist, a certified diabetes educator or a registered dietician—to help with diabetes management.
- Seek help and encouragement through a diabetes support group.

- Continue to obtain information on diabetes. The National Diabetes Education Program (<http://www.ndep.nih.gov/> or 1-800-438-5383) and organizations such as the American Diabetes Association (<http://www.diabetes.org/home.jsp> or 1-800-DIABETES), the American Association of Diabetes Educators and the Juvenile Diabetes Research Foundation International (<http://www.jdrf.org/> or 1-800-533-CURE) can be excellent resources to help in learning more about caring for diabetes.
- Get information about clinical trials in progress that may identify new and more effective medicines and treatment regimens to treat diabetes (Available at: <http://www.clinicaltrials.gov>).
- Talk about diabetes with family and friends to make them aware of ways they can help with diabetes management.

Table 4. Diabetes Care Checklist

<p>Daily diabetes care activities</p> <ul style="list-style-type: none"> <input type="checkbox"/> Exercise <input type="checkbox"/> Follow meal plan <input type="checkbox"/> Take diabetes medicine <input type="checkbox"/> Check blood glucose as recommended by a health care provider <input type="checkbox"/> Check feet for sores that are not healing properly <input type="checkbox"/> Brush teeth and floss <p>At doctor visits</p> <ul style="list-style-type: none"> <input type="checkbox"/> Get feet checked <input type="checkbox"/> Check blood pressure <p>At least twice per year</p> <ul style="list-style-type: none"> <input type="checkbox"/> Get an HbA_{1c} test <input type="checkbox"/> Get a dental check-up and have teeth cleaned by a dental professional <p>At least once per year</p> <ul style="list-style-type: none"> <input type="checkbox"/> Get a dilated eye exam <input type="checkbox"/> Get a complete foot exam—checking circulation and for changes in foot shape <input type="checkbox"/> Get a urine test for kidney function <input type="checkbox"/> Get a flu shot <input type="checkbox"/> Get blood lipid levels (cholesterol) checked
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SOURCE: National Diabetes Education Program. (2001). *7 principles for controlling your diabetes for life*. NIH Publication No. 99-4343L. Available at: http://www.ndep.nih.gov/diabetes/pubs/7Principles_Eng.pdf.

Families and Friends

People with diabetes need their family members and friends to help them manage their disease and keep track of their diabetes care. Here are some things families and friends can do to support people with diabetes:

- Plan walks or other activities with friends and family with diabetes to help them get regular exercise. Help them follow the advice of their health care provider about ways to exercise safely.
- Prepare healthy meals that fit into meal plans for people with diabetes and pre-diabetes.
- Offer to help friends or family members check their feet for sores or calluses.
- Provide transportation to the health care provider's office so that friends or family members do not miss important medical visits.
- Become aware of the signs and symptoms of hypoglycemia and hyperglycemia and how to appropriately treat them.
- If friends or family members do not understand English, help translate patient education materials into a language he/she knows or help identify resources that are language appropriate.
- Provide assistance to a friend or family member with diabetes that is sick with a cold, the flu, or another type of infection or illness. Being sick can raise blood glucose and may make it difficult to eat properly or monitor blood glucose as needed.
- If a child in your family has been diagnosed with diabetes, work closely with health care providers to develop a care plan that addresses diabetes and fits in with the child's schedule. Revisit the plan on an ongoing basis to make sure that changes in the child's condition or lifestyle are considered. Seek advice from health care providers about ways to teach children to be proactive in taking care of their diabetes.

Schools

Because diabetes must be managed on a daily basis, school staff (teachers, nurses, principals, and office staff) can play an important role in helping students manage their diabetes. Specific action steps for schools to take to help students manage diabetes include:

- Provide training for school staff that work with students with diabetes. This training should include basic information about diabetes and the student's needs, how to recognize medical emergencies, and steps to take in the event of an emergency.
- Work with children with diabetes and their parents or caregivers to follow the personalized diabetes care plan devised by the family and the health care team. The National Diabetes Education Program has compiled a comprehensive booklet called

“Helping the Student with Diabetes Succeed: A Guide for School Personnel,” which can be found at http://www.ndep.nih.gov/diabetes/pubs/Youth_NDEPSchoolGuide.pdf or by calling 1-800-860-8747.

Table 5. Examples of Items to Include in Flow Chart for Patients with Diabetes

<p>Each visit</p> <ul style="list-style-type: none">▪ Weight check▪ Blood pressure check▪ Foot exam▪ Diabetes education and self-management <p>Twice per year</p> <ul style="list-style-type: none">▪ HbA_{1c} test (quarterly if not within recommended range)▪ Dental exam <p>Annual</p> <ul style="list-style-type: none">▪ Lipid profile▪ Dilated eye exam▪ Physical exam for detecting nerve damage▪ Serum creatinine and urinalysis for protein, microalbumin to creatinine ratio to detect kidney disease <p>Vaccines</p> <ul style="list-style-type: none">▪ Influenza (annual)▪ Pneumoccal (usually only once, repeat if over age 64 or immunocompromised and the last vaccine was longer than 5 years ago)
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SOURCE: National Diabetes Education Program (NDEP). Guiding principles for diabetes care: for health care providers. HHS Publication No. 99-4343. Available at: http://www.ndep.nih.gov/diabetes/pubs/GuidPrin_HC_Eng.pdf. Accessed August 24, 2004.

Health Care Providers

Primary care providers, such as family physicians, internists, physicians’ assistants, and nurse practitioners, play an important role in providing routine high-quality diabetes care as well as referrals to other practitioners for specialty care. As new research and drugs become available and practice guidelines for diabetes evolve, it is critical for health care providers to stay abreast of standards of care and new evidence-based treatments and devices to support diabetes management. Important information for providers about diabetes care can be found at <http://www.ndep.nih.gov/resources/health.htm>, <http://www.betterdiabetescare.org>, http://care.diabetesjournals.org/content/vol28/suppl_1/. Possible action steps for the primary care provider include:

- Help patients control blood glucose levels. The DCCT and the UKPDS demonstrated that intensive therapy in blood glucose management is effective in delaying the onset of complications and slowing the progression of diabetes.⁷⁶
- Educate patients on the “ABCs of Diabetes”⁷⁷ (HbA_{1c}, blood pressure, and cholesterol) to lower overall risks for heart disease. Goal ranges are HbA_{1c} of less than 7 percent, blood pressure of less than 130/80, and cholesterol (LDL) of less than 100 mg/dl.⁷⁸
- Develop flowcharts that ensure patients with diabetes receive preventive and diagnostic services. Table 5 contains examples of care practices to include in flow charts for patients with diabetes.⁷⁹
- Advise women with diabetes considering pregnancy about the risks that diabetes poses for pregnancy and the importance of good blood glucose control before and during pregnancy.
- Incorporate information management systems, such as patient registries, to track patient health status and receipt of preventive care services and provide information about the patient’s status to the entire care team.
- Use office prompts (e.g., posters asking patients to remove their shoes and socks prior to the exam) to facilitate care.
- Work with patients and their families to develop comprehensive care plans that include lifestyle changes and medical services needed to control blood glucose, blood pressure, and LDL cholesterol and prevent and manage complications from diabetes. Care plans should include the following: a meal plan, an exercise program to help patients maintain a healthy weight and good cardiovascular health, diabetes education to guide self-management, and a schedule to ensure that patients receive preventive and diagnostic care services, such as HbA_{1c} tests, dilated eye exams, and foot exams in a timely manner.
- Prescribe medications (angiotensin converting enzyme inhibitors or angiotensin receptor blockers) that can slow progression of diabetic kidney disease in patients found to have hypertension and/or elevated urinary microalbumin.
- Ask if patients with diabetes smoke, and help those who smoke to stop smoking.
- Help educate patients’ family members and friends about ways they can help loved ones with diabetes to manage the condition.
- Refer patients with diabetes to various health care specialists and educators as appropriate.

⁷⁶ The Diabetes Control and Complications Trial Research Group, op.cit; and Turner, RC, op.cit.

⁷⁷ The ABCs of Diabetes, op.cit.

⁷⁸ National Diabetes Education Program (NDEP). *Guiding principles for diabetes care: For health care providers*. HHS Publication No. 99-4343. Available at: http://www.ndep.nih.gov/diabetes/pubs/GuidPrin_HC_Eng.pdf.

⁷⁹ *ibid.*

- Refer people with diabetes to community resources that can help them manage their diabetes.
- Facilitate community support groups for people with diabetes and their friends and family to help educate them about the health problems that can be caused by diabetes and the ways they can manage the disease and live healthy and productive lives.
- Talk with community leaders about diabetes and the importance of supporting people with diabetes.
- Translate patient materials into other languages for people in the community when feasible.
- Participate in clinical trials to evaluate new technologies for treating diabetes.
- Become involved in research studies to determine effective approaches for educating and treating patients with diabetes in various populations, such as children, elderly persons, and members of specific racial/ethnic groups.

Employers

Potentially, any one of your employees could have diabetes now or develop the disease in the future. Diabetes does not discriminate; it can affect anyone, regardless of age, race/ethnicity, or gender. Since the prevalence of diabetes is increasing, no matter how large or small your workforce, your company may be increasingly affected by diabetes. Employees need your support and assistance to continue to be productive and effective workers. Specific actions aimed to control diabetes and prevent its complications may help increase overall employee productivity and company profitability.⁸⁰ Specific action steps employers can take to support employees with diabetes include:

- Review the health plans offered to employees to determine benefits for health care services and supplies associated with diabetes management (e.g., physician visits, diabetes education, dietitian visits, blood glucose testing supplies).
- Encourage public reporting of health plan and provider performance in meeting diabetes care objectives.
- Seek out information about diabetes to better understand the needs of employees with diabetes. Information is available at <http://www.diabetesatwork.org/>.

Health Insurance Providers

Health insurance providers can also support management of diabetes through education and outreach efforts to their members. Bringing individuals into high-quality diabetes care early

⁸⁰ National Diabetes Education Program (NDEP). Making a difference, the business community takes on diabetes. Available at: <http://www.ndep.nih.gov/resources/business/index.htm>.

can help improve quality of life and may avoid complications. Some action steps for health insurance include:

- Distribute educational materials to health plan members with diabetes via direct mail or to health care providers for distribution.
- Inform women with diabetes about the importance of blood glucose control before and during pregnancy.
- Acknowledge providers that effectively use care guidelines to provide high-quality diabetes care.
- Consider offering health care providers incentives to follow evidence-based practice guidelines for care to optimize treatment outcomes.
- Educate patients about the importance of healthy lifestyle behaviors and self-blood glucose monitoring and management. Create patient education materials targeting groups that are particularly vulnerable to diabetes, such as children, people of various racial and ethnic groups, and elderly persons.
- Consider designing insurance benefits that cover evidence based services needed to treat diabetes, including diabetes self-management education.

Communities

Community organizations can play a vital role in educating people with diabetes and their family members about the importance of managing diabetes to prevent complications. Various national organizations (e.g., the American Diabetes Association, American Association of Diabetes Educators) may have a local chapter in your area that is working to help your friends and neighbors with diabetes. Some action steps for community organizations to consider include:

- Develop a directory of community resources for diabetes care and supplies that can be distributed to people with diabetes and their caregivers.
- Support efforts to raise awareness for diabetes by participating in local and national walk, run, or bike rides for diabetes.
- Coordinate efforts with groups that address chronic conditions related to diabetes, such as obesity and heart disease.
- Partner with local media outlets to develop and distribute messages about the importance of managing diabetes.
- Distribute information about diabetes treatment and management within the community (e.g., at stores, shopping malls, senior citizen centers, etc.).
- Organize support groups where people with diabetes and their caregivers can meet with health professionals and their peers to discuss ways to manage diabetes.
- Coordinate with local members of various racial/ethnic groups to develop patient education materials in different languages and formats.

- Encourage local restaurants and food chains to flag menu items that are appropriate for people with diabetes and/or provide nutritional information content of menu items.
- Join with local Chambers of Commerce to recognize employers for providing working conditions that support people with diabetes (e.g., Health Friendly Workplace awards).
- Partner with State Diabetes Prevention and Control Programs run by the State Health Department.

Media

Different kinds of popular media (e.g., television, radio, newspapers) can be used to inform people with diabetes and their caregivers about the importance of quality diabetes treatment and self-management. Specific action steps for working with the media include:

- Promote messages about managing diabetes by distributing information provided in health communication campaigns developed by the National Diabetes Education Program (available at http://www.ndep.nih.gov/campaigns/campaigns_index.htm; <http://www.ndep.nih.gov/campaigns/tools.htm#psa>).
- Promote National Diabetes Awareness Month (November of each year) on national, state, and local levels.
- Distribute messages in multiple languages so the information reaches people who do not speak English. Tools in various languages are available at: <http://www.ndep.nih.gov/diabetes/pubs/catalog.htm#PubsHispLatino> and <http://www.ndep.nih.gov/diabetes/pubs/catalog.htm#PubsAsianAm>.
- Partner with community clinics to provide information about where to go for diabetes care.
- Partner with medical professionals, federal, state, and local governments, and private-sector community entities to help the public understand the importance of managing and treating diabetes.
- Collaborate with public health researchers to test media messages and identify the most appropriate and effective messages to reach people with diabetes.
- Work with officials to provide public access networks to broadcast local conferences or training videos on diabetes management.
- Partner with local schools of nursing, medicine, and other health professionals to encourage young people to pursue careers in health care.
- Invite local celebrities, community leaders, health professionals, and citizens with diabetes to participate on radio or television talk shows and discuss their experiences

with diabetes and the importance of self-management and medical care. Similarly, newspapers can include feature stories about community members and their experiences with diabetes.

- Work with local professional organizations to identify and acknowledge health care providers who have excelled in diabetes treatment and education efforts.
- Recognize local, state, and national programs that have been successful in helping people with diabetes get the care and education they need.

Researchers and Professional Educators

Researchers and professional educators can play an important role to advance knowledge of diabetes treatment, develop new strategies to prevent its complications, and translate the research into messages that can reach those affected by diabetes and those working in this arena. Further, researchers and professional educators can help ensure that appropriate information is gathered to help inform policy makers. The following are some action items for these groups to consider:

- Continue research on finding a cure and enhanced treatments for diabetes.
- Explore partnerships with communities and other groups to help translate evidence-based practices and evaluation strategies to activities of these groups.
- Investigate the costs of diabetes and provide this information to officials and policy makers at federal, state, tribal, and local levels.
- Identify and address barriers to services that limit access to care for persons with diabetes.
- Continue applied qualitative research into successful treatment protocols and diabetes management strategies; studies into quality of life issues; and exploration of future systems capacity issues.
- Employ community-based research methods to engage the community in research (i.e., needs assessments, clinic site visits, focus groups).

State and local, Tribal, and Federal Governments

State and local, tribal, and federal governments can serve as important role models for other organizations by actively engaging in efforts to advance knowledge and take steps to minimize complications from diabetes, improve patient care, and enhance access to care. The following are suggestions for accomplishing this:

- Review and support policies and programs that help people with diabetes live healthy and productive lives.

- Examine health plan benefits for government employees to ensure coverage of evidence-based services to prevent or delay complications from diabetes.
- Support research to develop new effective strategies, devices, and medications for diabetes.
- Support efforts that help to decrease racial and ethnic disparities in diabetes care.
- Conduct surveillance activities to monitor trends in the prevalence of diabetes (i.e., the number of people who have diabetes) to inform diabetes treatment efforts.
- Continue to create and update educational materials for people with diabetes, their caregivers, employers, and schools that are available in various languages and formats to increase knowledge and understanding of this disease and how to help people with diabetes prevent or delay complications.
- Support efforts to recruit and train members of the healthcare workforce that can help people with diabetes in their communities live healthy lives.
- Continue to develop an evidence base of best practices for treating and managing diabetes. For example, the National Diabetes Education Programs Better Diabetes Care Web site (<http://betterdiabetescare.nih.gov/index.htm>)—provides best practice models, links, and resources to professionals for diabetes management—and the Indian Health Services' Indian Health Diabetes Best Practice Model Approaches (<http://www.ihs.gov/MedicalPrograms/Diabetes/index.asp>)—provides 14 best practice model approaches for successful diabetes prevention, treatment, and education practices in American Indian and Alaskan Native communities.

**LIST OF
ACRONYMS AND ABBREVIATIONS**

AADE	American Association of Diabetes Educators
ACOG	American College of Gynecologists and Obstetricians
ADA	American Diabetes Association
AHRQ	Agency for Healthcare Research and Quality
AoA	Administration on Aging
ASPE	Assistant Secretary for Planning and Evaluation
BPHC	Bureau of Primary Health Care, HRSA
CDC	Centers for Disease Control and Prevention
CMS	Centers for Medicare and Medicaid Services
DCCT	Diabetes Control and Complications Trial
DDT	Division of Diabetes Translation, CDC
DNPA	Division of Nutrition and Physical Activity, CDC
DPP	Diabetes Prevention Program
DRWG	Diabetes Research Working Group, NIH
FDA	Food and Drug Administration
HbA _{1c}	glycosylated hemoglobin or hemoglobin A _{1c}
HDL	High Density Lipoprotein
HHS	U.S. Department of Health and Human Services
HP 2010	Healthy People 2010
HRSA	Health Resources and Services Administration
IHS	Indian Health Service
LDL	Low Density Lipoprotein
LEA	Lower Extremity Amputation
NCCDPHP	National Center for Chronic Disease Prevention and Health Promotion, CDC
NDAP	National Diabetes Action Plan
NDEP	National Diabetes Education Program, NIH/CDC
NDL	National Diabetes Laboratory
NIDDK	National Institute of Diabetes and Digestive and Kidney Diseases, NIH
NIH	National Institutes of Health
OMH	Office of Minority Health, OPHS
TRIAD	Translating Research Into Action for Diabetes
UKPDS	UK Prospective Diabetes Study
USPSTF	U.S. Preventive Services Task Force
WISE WOMAN	Well Integrated Screening and Evaluation for Women Across the Nation

Appendix A:
Steps to a HealthierUS

STEPS TO A HEALTHIERUS

Steps to a HealthierUS (Steps) is a major initiative of the U.S. Department of Health and Human Services (HHS) that advances President George W. Bush's *HealthierUS* goal of helping Americans live longer, better and healthier lives. Recognizing that the United States is facing several serious public health challenges, Secretary Tommy G. Thompson launched *Steps to a HealthierUS* in 2003. At the heart of this program lie both personal responsibility for the choices Americans make and social responsibility to ensure that policy makers support programs that foster healthy behaviors and prevent disease. The *Steps* initiative envisions a healthy, strong U.S. population supported by a health care system in which diseases are prevented when possible, controlled when necessary, and treated when appropriate. This initiative is a shift in the traditional approach to the health of our citizens, moving us from a disease care system to a health care system.

Realizing that small changes over time can yield dramatic results, the *Steps* initiative is committed to identifying and promoting programs that encourage small behavior changes. With a strong emphasis on proven interventions and existing science, *Steps* will promote the following:

- Health promotion programs to motivate and support responsible health choices.
- Community initiatives to promote and enable healthy choices.
- Health care and insurance systems that put prevention first by reducing risk factors and complications of chronic disease.
- State and Federal policies that invest in the promise of prevention for all Americans.
- Cooperation among policy makers, local health agencies, and the public to invest in disease prevention instead of spending our resources to treat diseases after they occur.

The goal of the *Steps* initiative is to reverse the growth in the number of people suffering from chronic diseases like asthma, diabetes, cancer, heart disease and stroke, as well as factors that contribute to them such as obesity, poor nutrition, physical inactivity, and tobacco use. The intent of *Steps* is to reach the broadest number of Americans by using multiple approaches and involving groups and organizations to foster health, physical activity and good nutrition. To date, these approaches have focused on communities, businesses and organizations, and the actions that they can take to influence individuals' choices and actions to improve health. The *Steps* initiative has multiple components including:

- **Grants to Communities:** As the cornerstone of the *Steps* initiative, in 2004, HHS funded 22 cooperative agreements to 40 communities for a total of \$35.7 million to establish community-wide partnerships to improve the health and well being of individuals by encouraging people to maintain physically active lifestyles and make healthy lifestyle choices.

- **Grant to a National Organization:** In FY 2004, HHS awarded a \$2 million grant to the national office of the YMCA. With more than 2,500 YMCA's in the country, this funding will help strengthen the network of local YMCA chapters by developing and implementing strategies to work together with the 40 *Steps* grant communities also funded in 2004.
- **Roundtable Discussions:** The Secretary hosted a series of Roundtable discussions, which brought together interested stakeholders including academia, insurers, business executives, health care providers, and researchers. The purpose of these roundtables was to highlight the importance of prevention and specifically discuss best approaches to stem the tide of chronic diseases and encourage healthy lifestyles - regular physical activity and balanced diets. The roundtables also identified obstacles to adopting healthy habits.
- **Secretary's Challenge--Steps to a HealthierHHS:** This is an HHS worksite health promotion program encouraging Department employees to become more physically active. This voluntary initiative promotes the benefits of a healthy lifestyle by challenging employees to be on the move—at least 30 minutes a day, five days a week for six weeks. Nearly 800 employees participated, and 25 percent completed the pilot program in the Washington, DC, area.
- **Annual Prevention Summit:** Held on April 15-16, 2003 in Baltimore, Maryland, the inaugural *Steps to a HealthierUS: Putting Prevention First Summit* focused attention on the urgency of prevention and on promising approaches for tackling key challenges. At this conference, the Secretary laid out his priorities and programs for *Steps to a HealthierUS*. The second annual summit was held on April 29-30, 2004, in Baltimore, Maryland. Future summits are planned.
- **Annual Awards for Innovation:** Another component of the *Steps* initiative is the *Steps Innovation in Prevention Awards Program*. In December 2003, HHS awarded the first set of eight Steps Innovation Awards in seven categories, to groups and organizations recognizing their accomplishments and highlighting the concrete health improvements that each has achieved. The second round of awards will be announced in December 2004.
- **Partnerships:** Another aspect of the *Steps* initiative is the partnerships program where HHS seeks to work with other public and private sector organizations to support and promote healthier living. It is designed to encourage innovative opportunities to promote healthier living and prevent chronic diseases and conditions.
- **Secretarial Workgroups and the *Blueprint for Action*:** Recognizing the importance of many chronic diseases such as cancer, cardiovascular disease, and asthma, the Secretary established five senior staff workgroups on specific areas that were identified as presenting particular opportunities for cross-Departmental coordination and that are central to advancing health promotion and disease

prevention: overweight and obesity, diabetes, tobacco, media and messages, and health literacy. This work provided the basis for the Secretary's *Prevention: A Blueprint for Action* released in April of 2004. This *Blueprint* outlines simple action steps to guide individuals in their quest for healthier lifestyles. It also encourages other interested parties and organizations, such as providers, employers, communities, insurers, media, schools, and government to collaborate and cooperate to overcome obstacles, to promote healthy lifestyles and reduce the burden of chronic diseases.

More information about *Steps to a HealthierUS* is available at: <http://www.healthierus.gov/steps>.

Appendix B: Medicare and Diabetes

MEDICARE AND DIABETES

The Medicare program is a federal health insurance program for people age 65 or older, people under age 65 with certain disabilities, and people with end-stage renal disease (ESRD). Medicare covers more than 40 million beneficiaries.

Current Medicare Coverage of Services and Supplies for Individuals with Diabetes

Medicare covers important services and supplies for individuals with diabetes.

- **Self-Management Training Services**

Medicare currently covers diabetes self-management training under Part B for certain beneficiaries who are at risk for complications from diabetes. Under Medicare fee-for-service (FFS) a beneficiary pays 20% of the Medicare-approved amount after the yearly Part B deductible.

- **Medical Nutrition Therapy Services**

Medicare Part B also covers medical nutrition therapy services for people with diabetes or kidney disease. These services can be given by a registered dietician or nutrition professional and include diet counseling and therapy services to help a beneficiary manage their diabetes. Under Medicare FFS, a beneficiary pays 20% of the Medicare-approved amount after the yearly Part B deductible.

- **Diabetic Supplies and Therapeutic Shoes**

Medicare Part B covers diabetic self-testing equipment and supplies for beneficiaries who have diabetes. Medicare covers the same supplies for people with diabetes whether or not they use insulin. The self-testing equipment and supplies include glucose testing monitors, blood glucose test strips, lancet devices and lancets, and glucose control solutions. There may be some limits on the supplies or how often a beneficiary may receive the supplies. Medicare also covers therapeutic shoes for people with diabetes who qualify under Medicare Part B. The coverage includes depth-inlay shoes, custom-molded shoes and shoe inserts.

Current Coverage of Preventive Services for Individuals with Diabetes

Currently, Medicare Part B covers several preventive services that are important to individuals with diabetes.

- **Flu and Pneumococcal Pneumonia Vaccinations**

Medicare Part B covers flu and pneumococcal pneumonia vaccinations. All Medicare beneficiaries are covered. Under Medicare FFS, there are no out-of-pocket costs for beneficiaries if the health care provider accepts assignment.

- **Glaucoma Screening**

For beneficiaries who are at high risk for glaucoma, including people with diabetes or a family history of glaucoma Medicare covers glaucoma screening once every 12 months. The screening must be performed or supervised by an eye doctor who is legally allowed to do this

service in the State. Under Medicare FFS, a beneficiary pays 20% of the Medicare-approved amount after the yearly Part B deductible.

- **Other Preventive Services**

Medicare also provides coverage for the following preventive benefits under Part B: bone mass measurement, colorectal cancer screening, mammography screening, screening pap smear and pelvic exams and prostate cancer screening.

Medicare Modernization Act of 2003 Improvements for Individuals with Diabetes

The new law enhances diabetes coverage for beneficiaries by adding several improvements.

- **Welcome to Medicare Physical**

Beginning in 2005, the new law provides new coverage of a one-time preventive physical exam within 6 months of a beneficiary's enrollment under Part B. The initial preventive physical will consist of a comprehensive examination that will allow the physician to diagnose problems early when treatment is more effective. In addition, the physician and office staff will provide education, counseling and referral to other preventive services covered by Medicare.

- **Cardiovascular Screening Tests**

The new law provides Medicare coverage of cardiovascular screening blood tests, including tests for total cholesterol, high-density lipoprotein, and triglycerides.

- **Diabetes Screening Tests**

Beginning in 2005, the new law will supply new coverage of diabetes screening tests for persons at risk for diabetes, including a fasting plasma glucose test and such other tests as the Secretary may determine appropriate. Eligible risk factors include hypertension, dyslipidemia, obesity, prior identification of impaired fasting glucose or glucose tolerance, or at least two of the following: overweight, family history of diabetes, history of gestational diabetes or delivery of a baby over 9 pounds.

- **Medicare Part D Drug Benefit**

The new Medicare Part D drug benefit will cover insulin and associated diabetic supplies (including syringes) beginning in 2006.

- **Medication Therapy Management**

Beginning in 2006, the new comprehensive prescription drug benefit will include drug therapy management for beneficiaries with multiple chronic diseases, including diabetes, who take multiple drugs and spend more than a specified amount annually on drugs covered under the prescription drug benefit. The drug management programs will help ensure the best therapeutic outcomes and reduce the risk of adverse medication events.

**Appendix C:
Development of Diabetes: A National Plan for
Action**

DEVELOPMENT OF DIABETES: A NATIONAL PLAN FOR ACTION

Prompted by the Secretary's commitment to disease prevention and health promotion, and efforts of interested individuals and organizations, the creation of Diabetes: A National Plan for Action (hereby referred to as the National Diabetes Action Plan—NDAP) offers an important opportunity to identify and coordinate activities among relevant stakeholders to improve diabetes prevention, detection and care. The development of the action plan reflects the cross cutting interest in this topic and the dedication of many entities to the prevention, detection and treatment of diabetes.

The goals of the NDAP are:

1. Increase national awareness of diabetes, its impact, and what various stakeholders can do to prevent or manage the disease;
2. Reduce the prevalence of diabetes and factors that increase the risk of diabetes;
3. Promote improved detection, monitoring, and treatment of the disease; and
4. Identify existing public and private efforts to facilitate coordination and to leverage existing resources for detection, prevention, and treatment of diabetes.

The process to develop the NDAP involved:

1. An Internal Advisory Committee from the U.S. Department of Health and Human Services (HHS);
2. A series of three participatory town hall meetings; and
3. A literature review.

Internal Advisory Committee

The NDAP Internal Advisory Committee, comprised of senior officials from the various HHS agencies, provided advice on the scope and content for the plan. In addition, the Advisory Committee provided guidance throughout the NDAP development process and helped to establish the focus and parameters of the plan. The committee also reviewed a draft of the plan and provided input on the recommendations and action steps.

Advisory Committee Members

- **Michael O'Grady, PhD** (Committee Chair)
Assistant Secretary for Planning and Evaluation

- **Kevin Keane**
Assistant Secretary for Public Affairs
- **Howard Zucker, MD, JD, LLM**
Acting Deputy Assistant Secretary for Health, Office of Public Health and Science
- **Garth Graham, MD, MPH**
Acting Deputy Assistant Secretary for Minority Health, Office of Minority Health, Office of Public Health and Science
- **Nathan Stinson, Jr., PhD, MD, MPH,**
Formerly the Deputy Assistant Secretary for Minority Health, Office of Minority Health
- **Carolyn Clancy, MD**
Director, Agency for Healthcare Research and Quality
- **John Wren**
Director for Planning and Policy Development, Administration on Aging
- **Frank Vinicor, MD**
Director, Division of Diabetes Translation, Centers for Disease Control and Prevention
- **Sean Tunis, MD**
Chief Medical Officer/Director, Office of Clinical Standards and Quality, Centers for Medicare & Medicaid Services
- **Lester Crawford, DVM, Ph.D.**
Deputy Commissioner of Food and Drugs, Food and Drug Administration
- **Sam Shekar, MD, MPH**
Associate Administrator, Bureau of Primary Health Care, Health Resources and Services Administration
- **Craig Vanderwagen, MD**
Acting Chief Medical Officer, Indian Health Service
- **Allen Spiegel, MD**
Director, National Institute of Diabetes and Digestive and Kidney Diseases National Institutes of Health

Town Hall Meetings

Three town hall meetings provided public forums for the Secretary to listen to comments from the diabetes community. The information gathered in these forums helped to inform the development of NDAP.

The general structure of each town hall meeting consisted of a half-day session, which opened with an introduction by the Secretary or a senior HHS official. This was followed by a series of statements from HHS staff and invited national, state, and local experts and policymakers on diabetes data concerning prevention, detection, and treatment, for each of the town hall meetings respectively. The presentations were followed by an open-microphone session where individuals and representatives of the diabetes groups asked questions or made comments.

The meetings were advertised through local newspapers (including newspapers with high minority readership) and radio. In addition, letters of invitation were sent to local groups and leaders in the diabetes community, public health sector, and health services field. Both a Web site and a toll-free telephone line were provided for participants to register and obtain additional information.

The town hall meetings were held in different locations around the country and each focused on a different facet of diabetes:

Putting Prevention Into Practice: A Diabetes Town Hall Meeting
The Cincinnati Hilton Netherland Plaza
Cincinnati, Ohio
March 29, 2004

Expert Panel:

Secretary Thompson

Allen Spiegel, MD, Director, NIDDK

The Honorable Jennette Bradley, Lieutenant Governor and Director of Commerce for Ohio

J. Nick Baird, MD, Director, Ohio Department of Health

James Holsinger, PhD, Secretary of the Cabinet for Health Services, Kentucky

Steve Collier, Superintendent, Norwood City Schools

Jerry Mallicoat, Vice President of Midwest Marketing, Anthem Blue Cross/Blue Shield

Francine Kaufman, MD, Past President, The American Diabetes Association

Nicole Johnson, Miss America 1999

Diabetes Detection and Education: Steps to a HealthierUS

Doubletree Hotel
Little Rock, Arkansas
June 18, 2004

Expert Panel:

Secretary Thompson
The Honorable Mike Huckabee, Governor of Arkansas
Allen Spiegel, MD, Director, NIDDK
Donald A. Young, MD, Deputy Assistant Secretary for Health Policy/ASPE
Jane Kelly, MD, Program Director, National Diabetes Education Program, CDC
Fay Boozman, MD, MPH, Director, Arkansas Department of Health
Virginia Zamudio, RN, MSN, CDE, President, American Association of Diabetes Educators
Victor H. Gonzalez, MD, National Board Member, American Diabetes Association
Simmie Armstrong, Jr., MD, Pine Bluff Family Medical Center, Arkansas

Treatment of Diabetes: Steps to a HealthierUS

Westin Seattle
Seattle, Washington
July 26, 2004

Expert Panel:

Secretary Thompson
George R. Nethercutt, Jr, JD, U.S. House of Representatives, Chairman of the Congressional Diabetes Caucus
Michael O'Grady, PhD, Assistant Secretary for Planning and Evaluation, HHS
Allen Spiegel, MD, Director, NIDDK
Mary Selecky, Secretary, Washington Department of Health
Francine Kaufman, MD, Past President, The American Diabetes Association
Steven Kahn, MB, ChB, Director of Research and Development, VA Puget Sound Health Care System
Gerald Nepom, MD, PhD, Director, Benaroya Research Institute at Virginia Mason, Juvenile Diabetes Research Foundation International
Joe Finkbonner, R.Ph, MHA, Director of the Epidemiology Center, Northwest Portland Area Indian Health Board
Bradley J. Enegren, Vice President and General Manager, Research and Development, Medtronic, Inc.
Nicole Johnson, Miss America 1999
Angela Bartels, RN, BSN, Diabetes Coordinator, 45th Street Medical Clinic

In total, approximately 1,200 people attended the three town hall meetings. The participants represented a broad cross-section from the diabetes community, including people living with diabetes and their friends and family members; people at risk for diabetes who have been successful making behavioral changes; health care providers; physicians; people who have worked with persons with diabetes; experts, public health practitioners, and researchers; legislators; diabetes advocacy groups; and private-sector entities.

Literature Review

In addition to information gathered through the town hall meetings, additional resources collected from a variety of sources informed the NDAP, including input from the internal HHS advisory group and information shared by HHS agencies. A thorough literature review was conducted. In addition, information submitted by interested organizations (e.g., American Diabetes Association, Juvenile Diabetes Research Foundation, American Association of Diabetes Educators) was also examined.

Appendix D:
Current Federal Diabetes Activities/Highlights

CURRENT FEDERAL DIABETES ACTIVITIES/HIGHLIGHTS

Multiple agencies within the federal government have initiated a broad range of diabetes prevention, detection, and treatment activities. Many state and local agencies have adopted and implemented these activities and programs. Selected examples of these federal efforts are listed below. Web site addresses are provided (where applicable) for more detailed information.

Prevention

Various agencies within the U.S. Department of Health and Human Services (HHS) have developed health communication campaigns to raise awareness of diabetes and educate patients, providers, employers, and school personnel about how to prevent or delay complications from diabetes.

- ***Steps to a HealthierUS: Putting Prevention First***—This program is part of President Bush’s *HealthierUS* initiative which focuses on preventing chronic diseases and conditions, including obesity, asthma, diabetes, heart disease, stroke, and cancer. It includes funds for innovative community-based programs to address asthma, diabetes, and obesity. The *Steps* campaign is a bold shift from a *disease* care system that relies almost exclusively on physician interventions to a *health* care system where a community-based public health infrastructure supports individuals in making healthy lifestyle choices. More information is available at <http://www.healthierus.gov/steps>. (See Appendix A)
- ***Initial Preventive Physical Examination and Other New Medicare Benefits***—The Medicare Prescription Drug, Improvement, and Modernization Act (MMA) of 2003 establishes coverage of a one-time “Welcome to Medicare Physical Examination” within 6 months of a beneficiary’s first coverage under Part B, with the goal of health promotion and disease detection. The benefit covers a physical exam (including measurement of height, weight and blood pressure, and an electrocardiogram) and includes education, counseling and referral with respect to screening and other preventive services. The effective date is January 1, 2005, for new beneficiaries whose coverage period under Medicare Part B begins on or after that date. The MMA also adds coverage for cardiovascular and diabetes screening for Medicare beneficiaries, which also begins on January 1, 2005.
- ***Small Steps, Big Rewards: Prevent Type 2 Diabetes***—A feature of the National Diabetes Education Program, this educational campaign was introduced in November 2002. The campaign and its multicultural components introduced in 2004, are built on the findings of the Diabetes Prevention Program clinical trial conducted by the National Institute of Diabetes and Digestive and Kidney Diseases. The program Web site provides tool kits and other products intended to motivate people to reduce their risk for type 2 diabetes by losing a modest amount of weight and being more physically active. More information is available at <http://www.smallstep.gov/> or http://www.ndep.nih.gov/campaigns/SmallSteps/SmallSteps_index.htm

- ***Weight Control Information Network (WIN)***— This network is a national information service of the National Institute of Diabetes and Digestive and Kidney Diseases. WIN develops and distributes science-based materials on obesity, weight control, physical activity, and nutrition for patients, health care professionals, and others in English and Spanish. WIN also created the *Sisters Together: Move More, Eat Better* media program that encourages Black women 18 and over to maintain a health weight by becoming more physically active and eating healthier foods. More information on WIN is available at <http://win.niddk.nih.gov/index.htm>.
- ***National Diabetes Information Clearinghouse (NDIC)***—The NDIC is an information dissemination service of the National Institute of Diabetes and Digestive Kidney Diseases. The NDIC was established to increase knowledge and understanding about diabetes among patients, health care professionals, and the general public through the effective dissemination of information. Patients and health care providers can contact the NDIC with inquiries about diabetes and order educational material. More information is available at <http://diabetes.niddk.nih.gov>.
- ***National Agenda for Public Health Action: A National Public Health Initiative on Diabetes and Women's Health***—This initiative offers recommendations to help health professionals, women and their families, health care systems, worksites, communities, and schools address the burden of diabetes among women. The Centers for Disease Control and Prevention is working with public- and private-sector partners to implement the plan. More information is available at <http://www.cdc.gov/diabetes/pubs/action/index.htm>.
- ***Take Time to Care About Diabetes***—This campaign developed by the Food and Drug Administration Office of Women's Health is intended to raise women's awareness of the seriousness of diabetes and the importance of taking steps to treat the disease to avoid heart and kidney problems, blindness, stroke, or amputation of a lower limb. More information is available at <http://www.fda.gov/womens/taketimetocare/diabetes/default.htm>.
- ***Diabetes Today***—Developed by the Centers for Disease Control and Prevention's (CDC) Division of Diabetes Translation, *Diabetes Today* is a course that provides training for public health professionals and community leaders to learn how to mobilize communities to address diabetes. This curriculum is based on the philosophy that people can take charge of diabetes at the community level. Rather than relying on expensive medical treatment after the complications of diabetes have developed, community members—such as people with diabetes and their families, health professionals, and other concerned individuals—can work together to prevent and control diabetes. For more information, call toll-free 1-877-CDC-DIAB, e-mail diabetes@cdc.gov, or visit the Diabetes Today National Training Center and the Pacific Diabetes Today Resource Center. More information is available at <http://www.diabetestodayntc.org/>.
- ***Making Systems Change for Better Diabetes Care***—As part of National Diabetes Education Program, this comprehensive Web site provides information and tools to make effective systems changes and provide better quality care for the diagnosis, treatment, and prevention of diabetes. More information is available at <http://betterdiabetescare.nih.gov/>.

- ***Diabetes Prevention Program (DPP)***—The Diabetes Prevention Program (DPP) was a multi-center clinical trial led by the National Institute of Diabetes and Digestive and Kidney Diseases at 27 sites around the country. The study demonstrated that sustained lifestyle changes, including modest weight loss and regular physical activity, substantially reduced progression to type 2 diabetes, especially among older adults who were at very high risk. DPP showed that people with pre-diabetes (i.e., elevated blood glucose levels that are not yet high enough to be classified as diabetes) can prevent or delay the onset of type 2 diabetes by losing 5 percent to 7 percent of their body weight and participating in moderate physical activity (e.g., walking 30 minutes per day 5 days per week). Results from DPP were so compelling that the trial was ended a year early. The lifestyle intervention worked equally well for men and women and all racial/ethnic groups, and it was most effective among people aged 60 and older.⁸¹
- ***Nutrition and Physical Activity to Prevent Obesity and Other Chronic Diseases program***—The Centers for Disease Control and Prevention’s Division of Nutrition and Physical Activity developed this program in response to the growing epidemic of overweight and obesity in the United States. This is a comprehensive program designed to help states maximize the effectiveness of their efforts to prevent obesity by addressing two related risk factors: nutrition and physical activity. The goal of the program is to make the United States a nation where all people can achieve and maintain a healthy body weight. Through a cooperative agreement process, this initiative provides funds to states for up to five years for programs aimed at reducing the rate of obesity among their citizens. More information is available at http://www.cdc.gov/nccdphp/dnpa/obesity/state_programs/index.htm.
- ***Diabetesatwork.org***—The National Diabetes Education Program’s business and managed care Web site www.diabetesatwork.org is an online diabetes and health resource kit that can help businesses and managed care companies assess the impact of diabetes in the work place. It presents employers with an interactive assessment tool to demonstrate the economics of better diabetes prevention and control guidance for choosing health care plans, and tools for developing worksite interventions and wellness programs. It also provided easy-to-understand information for employers to help employees manage their diabetes and take steps toward reducing the risk for diabetes-related complications such as heart disease. More information can be found at <http://www.diabetesatwork.org>
- ***National Diabetes Prevention Center (NDPC)***—This Centers for Disease Control and Prevention funded national center, is working to identify, design, adapt, and share effective programs for diabetes prevention and control in American Indian and Alaskan Native communities. The NDPC supports initiatives in tribal education systems, information technology, diabetes self-management education, sharing diabetes prevention efforts across American Indian and Alaska Native communities, and translating promising practices that are both culturally relevant and science-based. More information is available at <http://www.cdc.gov/diabetes/projects/ndpc.htm>.

⁸¹The *Finnish Diabetes Prevention Study* conducted by the National Public Health Institute–Helsinki yielded similar findings supporting the importance of maintaining a healthy weight to prevent type 2 diabetes.; and Diabetes Prevention Program Research Group. (2002). Reduction in the incidence of type 2 diabetes with lifestyle intervention or Metformin. *New Eng J Med* 346(6):393-403.

- ***You Can! Campaign***—Developed by the Administration on Aging, the *You Can!—Steps to a Healthier Aging* campaign is a part of the Steps to a *HealthierUS* initiative. The *You Can!* campaign is designed to increase the number of older adults who are active and healthy through a partnership approach to mobilizing communities. These community partnerships will increase public awareness and provide appropriate programs to help older Americans improve their nutrition and physical activity.
- ***Health Disparities Collaborative –Diabetes Prevention***—The Health Resources and Services Administration, Bureau of Primary Health Care in collaboration with the Centers for Disease Control and Prevention, National Institutes of Health, and other partners, including the Institute for Healthcare Improvement are working to prevent diabetes among high risk individuals served by Federally Funded Health Centers. A Health Disparities Collaborative Diabetes Prevention pilot has been completed with excellent results in patient outcomes. The learning from the Diabetes Prevention collaborative will be integrated with the Cardiovascular Collaborative for improved primary health care in Federally Funded Health Centers. (See Current Activities—Treatment section for additional information on the Health Disparities Collaboratives).

Detection

Agencies within the U.S. Department of Health and Human Services (HHS) have developed a number of initiatives to promote detection of diabetes in the U.S. Agencies are also conducting research into the most effective strategies for screening pre-diabetes as well as type 2 diabetes.

- ***Diabetes Detection Initiative***—This HHS initiative is a community-based effort to identify persons with undiagnosed type 2 diabetes and refer them for follow-up blood testing and treatment, if appropriate. It uses community involvement strategies within health systems in communities throughout HHS regions. It is being pilot tested in 10 locations through 2004. Early diagnosis and proper treatment of diabetes can prevent or delay serious diabetes-related health problems. More information is available at <http://www.ndep.nih.gov/ddi>.
- ***SEARCH for Diabetes in Youth***—Rising rates of diabetes among youths are a growing public health concern. The Centers for Disease Control and Prevention and the National Institutes of Health are funding this 5-year, multicenter study to examine the status of diabetes among U.S. children and adolescents. More information is available at <http://www.searchfordiabetes.org/index.cfm>.
- ***The U.S. Preventive Services Task Force (USPSTF)***—This Task Force was convened by the U.S. Public Health Service to conduct comprehensive reviews of clinical research to assess the merits of preventive measures, including screening tests, counseling, immunizations, and chemoprevention. The Task Force comprises an independent panel of primary care and prevention experts from the private sector. To date, USPSTF has conducted reviews of evidence related to screening for type 2 diabetes and gestational diabetes, obesity in adults, and counseling for physical activity and healthy diet. <http://www.ahrq.gov/clinic/uspstfix.htm>

- ***Healthy Aging Initiative***—A joint project by the Administration on Aging and the Centers for Disease Control and Prevention in which grants are awarded to states to implement evidence-based disease prevention programs at the community level. There are fourteen collaborative projects with State Units on Aging and State Health Departments, including one project focused on diabetes screening, 7 projects focused on physical activity, and three projects focusing on assisting older Americans with disease self-management.

Treatment

The availability of high-quality diabetes care services is crucial to support persons with diabetes in their efforts to manage the disease and prevent complications. Agencies within HHS support a variety of programs intended to measure and inform the quality of diabetes care in the United States.

- ***National Healthcare Quality and Disparities Reports***—These congressionally mandated annual reports on health care quality and health disparities in the United States include a broad set of performance measures that will be used to monitor the nation’s progress toward improved health care quality. Each of these reports contains measures that specifically address diabetes care. More information is available at <http://www.qualitymeasures.ahrq.gov>.
- ***The National Quality Measures Clearinghouse™ (NQMC™)***,—Sponsored by HHS’s Agency for Healthcare Research and Quality (AHRQ), The National Quality Measures Clearinghouse (NQMC) is a database and Web site for information on specific evidence-based health care quality measures and measure sets. NQMC is sponsored by AHRQ to promote widespread access to quality measures by the health care community and other interested individuals. As of spring 2004, the NQMC contained 23 measures that address diabetes care. More information is available at <http://www.ahrq.gov/qual/measurix.htm>.
- ***Diabetes Care Quality Improvement: A Resource Guide for State Action***—The Agency for Healthcare Research and Quality (AHRQ), in partnership with The Council of State Governments, produced the *Diabetes Care Quality Improvement: A Resource Guide for State Action* and its companion workbook, to help states assess the quality of diabetes care and develop quality improvement strategies. These tools provide an overview of the factors that affect quality of care for diabetes; present the core elements of health care quality improvement; assist state policymakers in using the data from AHRQ’s 2003 *National Healthcare Quality Report* for planning state-level quality improvement activities; and, provide a variety of best practices and policy approaches that national organizations, the Federal Government, and states have implemented related to diabetes quality improvement. The *Diabetes Care Quality Improvement: A Resource Guide for State Action* is available online at <http://www.ahrq.gov/qual/diabetes/>. The companion workbook is available at <http://www.ahrq.gov/qual/diabetes/workbk.htm>. Printed copies may be ordered by calling 1-800-358-9295 or by sending an e-mail to ahrqpubs@ahrq.gov.
- ***The Community Guide to Preventive Services***—The Task Force on Community Preventive Services is a 15-member nonfederal task force supported by the Centers for

Disease Control and Prevention (CDC). CDC scientists review the effectiveness of health care interventions for the task force, which then makes recommendations to the public health community and health care delivery organizations. The recommendations generated by the task force are combined to form the *Guide to Community Preventive Services*, which includes a section on diabetes. To improve the health of people with diabetes, the task force reviewed the evidence of the effectiveness of diabetes disease and case management and self-management education. More information is available at <http://www.thecommunityguide.org/diabetes/default.htm>.

- ***Health Disparities Collaborative -Diabetes***—The Health Resources and Services Administration, Bureau of Primary Health Care in collaboration with the Centers for Disease Control and Prevention, National Institutes of Health, and other partners, including the Institute for Healthcare Improvement are working to improve diabetes care within Federally Funded Health Centers. The purpose of the Health Disparities Collaborative–Diabetes is to improve diabetes care and performance measures through improved health care delivery systems, and to increase access and decrease health disparities among medically underserved populations. The learning from the Diabetes collaborative will be integrated with the Cardiovascular Collaborative for improved primary health care in Federally Funded Health Centers.

In addition, the Diabetes and Diabetes Prevention (see Current Activities—Prevention section) collaboratives are intended to generate and document improved health outcomes for underserved populations and transform clinical practice through models of patient centered care, improvement, and learning; develop infrastructure, expertise, and multidisciplinary leadership to support and drive improved health status; and build strategic partnerships, which have increased access to expertise, computer software, discounted pharmaceuticals and HbA_{1c} tests, laboratory equipment, direct community resources for patients, health education materials, and community-level marketing and educational resources. More information is available at <http://www.healthdisparities.net/>

- ***Indian Health Service (IHS)***—The Indian Health Service (IHS), National Diabetes Program (NDP) promotes collaborative strategies for the prevention of diabetes and its complications in the 12 IHS Service Areas through coordination of a network of 19 Model Diabetes Programs and 13 Area Diabetes Consultants. The NDP also manages the Special Diabetes Program for Indians grant program with 332 grantees in 35 states. In addition, the IHS has developed standards of care that are routinely updated to help provide consistent, quality care to patients with diabetes. More information is available at <http://www.ihs.gov/MedicalPrograms/Diabetes/>.
- ***Healthy People 2010 (HP2010)***—Healthy People 2010 is a set of disease prevention and health promotion objectives for the nation to achieve by 2010. It includes 17 objectives specifically aimed at reducing the disease and economic burden of diabetes and improving the quality of life for all persons who have or are at risk for diabetes. In addition, Centers for Disease Control and Prevention, Division of Diabetes Translation's National Objectives include measures for tracking the quality of diabetes care received. For example, these programs assess the number of foot exams, eye exams, and annual HbA_{1c} tests conducted.

- ***The Centers for Medicare & Medicaid Services (CMS)***—The Centers for Medicare & Medicaid Services (CMS) provides benefits to Medicare beneficiaries for diabetes self-management training, medical nutrition therapy, prescription drugs, and select testing equipment for persons with diabetes. In addition, CMS sponsors the National Diabetes Eye Exam Program that matches Medicare beneficiaries aged 65 and older who have diabetes and have not had a medical eye exam in the past 3 years with a volunteer ophthalmologist in their area to receive a free comprehensive eye exam and up to 1 year of follow-up care for any condition diagnosed at the initial exam. For more information about Medicare coverage of diabetes services, go to <http://www.cms.hhs.gov>.
- ***The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)***— This Institute of the National Institutes of Health supports basic and clinical research at universities and medical centers throughout the U.S. and at research facilities in Bethesda, Maryland and Phoenix, Arizona. NIDDK research forms the scientific foundation for improvements in diabetes care and for messages delivered via the National Diabetes Education Program. Examples of NIDDK-supported research include the Diabetes Control and Complications Trial and the Diabetes Prevention Program (previously discussed). There are many other ongoing diabetes research efforts. One important effort is Trial Net, an international network of investigators, clinical centers, and core support facilities whose aim is to recruit patients and support studies that will result in an improved understanding of type 1 diabetes disease development and conduct prevention trials (<http://www.diabetestrialnet.org>). Another is TEDDY (The Environmental Determinants of Diabetes in the Young), which is developing and carrying out research to identify environmental causes of type 1 diabetes in genetically susceptible individuals (<http://www.teddystudy.org/>). A third is STOPP-T2D (Studies to Treat or Prevent Pediatric Type 2 Diabetes), which is conducting pilot studies for a school-based trial directed at preventing the risk factors for type 2 diabetes in middle school children, and a multicenter clinical trial of optimal treatment for adolescents with type 2 diabetes (<http://www.todaystudy.org/>). For more information on type 1 and type 2 diabetes research, please visit <http://diabetes.niddk.nih.gov/>.
- ***The Diabetes Control and Complications Trial (DCCT)*** — provided evidence that improving control of blood glucose levels delays the onset and progression of eye, kidney, and nerve diseases caused by diabetes. An ongoing epidemiologic follow-up study of this population, Epidemiology of Diabetes Interventions and Complications (EDIC) study, has shown that the effectiveness of a limited period of intensive glycemic control on reducing complications persist 20 years after the study began and become even stronger over time. More information is available at <http://diabetes.niddk.nih.gov/dm/pubs/control/index.htm>.
- ***National Diabetes Education Program (NDEP)—Helping the Student with Diabetes Succeed: A Guide for School Personnel***—This comprehensive guide is designed to empower school personnel, parents, and students to create a safe learning environment and provide equal access to educational opportunities for all children with diabetes. More information is available at <http://www.ndep.nih.gov/resources/school.htm>.
- ***The Diabetes Research Working Group (DRWG)*** was established in 1997 to develop a comprehensive plan of recommended future diabetes research initiatives. The group met over the period of one year and generated *Conquering Diabetes: A Strategic Plan for the*

21st Century (available at <http://www.niddk.nih.gov/federal/dwg/dwgmain.htm>), which addressed three main topics:

- Extraordinary Opportunities in Diabetes Research—rapidly expanding, crosscutting areas in which increased investment or development of new mechanisms will significantly speed research in areas such as genetics of diabetes, autoimmunity and the beta cell, and obesity.
 - Special Needs for Special Problems—research targeted to specific populations, complications, and methodological approaches.
 - Resource and Infrastructure Needs—expanding research infrastructure (e.g., trained professionals and technology).
- ***Be Smart About Your Heart: Control the ABCs of Diabetes***—This campaign, developed by the National Diabetes Education Program, encourages people with diabetes to control not only their blood glucose (sugar), but also their blood pressure and cholesterol. More information is available at http://www.ndep.nih.gov/campaigns/BeSmart/BeSmart_index.htm
 - ***National Kidney Disease Education Program (NKDEP)***—The National Kidney Disease Education Program, sponsored by the National Institute of Diabetes and Digestive and Kidney Diseases, aims to raise awareness of the seriousness of kidney disease, the importance of testing those at high risk, and the availability of treatment to prevent or slow kidney failure. The NKDEP is designed to close the gap between evidence and practice by educating people at risk and physicians, with the goal of identifying kidney disease in its early, treatable stages. More information on the NKDEP can be found at <http://www.nkdep.nih.gov>.
 - ***National High Blood Pressure Education Program (NHBPEP)***—This goal of this program, which is coordinated by the National Heart, Lung, and Blood Institute of the National Institutes of Health, is to reduce death and disability related to high blood pressure through programs of professional, patient, and public education. The NHBPEP is a cooperative effort among professional and voluntary health agencies, state health departments, and many community groups. More information is available at <http://www.nhlbi.nih.gov/about/nhbpep>.
 - ***National Cholesterol Education Program (NCEP)***—The goal of the National Cholesterol Education Program is to contribute to reducing illness and death from heart disease in the U.S. by reducing the percent of Americans with high blood cholesterol. The NCEP directs educational efforts targeted at both health professionals and the public. The program aims to raise awareness and understanding about high blood cholesterol as a risk factor for heart disease and the benefits of lowering cholesterol levels as a means of preventing heart disease. More information about this program, which is coordinated by the National Heart, Lung, and Blood Institute of the National Institutes of Health, can be found at <http://www.nhlbi.nih.gov/about/ncep/>.
 - ***National Eye Health Education Program (NEHEP)***—The focus of the National Health Education Program is on public and professional education programs that encourage early detection and timely treatment of diabetic eye disease and glaucoma and the appropriate treatment for low vision. This program is coordinated by the National Eye

Institute of the National Institutes of Health in partnership with a variety of public and private organizations. More information can be found at <http://www.nei.nih.gov/nehep/>.

- ***Family Center Support Project***—The Centers for Disease Control and Prevention, Division of Diabetes Translation has undertaken a 5-year behavioral research project that will identify and examine nontraditional psychosocial factors regarding diabetes education and the family. These factors include community characteristics, health care reimbursement, family processes, diabetes education, provider-patient characteristics, acculturation or westernization, as well as psychological factors. Previously unrecognized factors include racism, living arrangements, perceptions of safety, and intergenerational coping skills, and their overall impact on psychological well being. More information is available at <http://www.cdc.gov/diabetes/projects/family.htm>.
- ***Translating Research Into Action for Diabetes (TRIAD)***—Translating Research Into Action for Diabetes is a 5-year, six-center prospective study of managed care and diabetes quality of care, costs, and outcomes in the United States. In its third year, this important study is the first and largest multicenter study of diabetes quality of care, quality of life, and factors affecting them. TRIAD is currently developing plans to carry out a detailed assessment of socioeconomic status and how it relates to quality of care and health status with diabetes. Sponsored by Centers for Disease Control and Prevention and National Institute of Diabetes and Digestive and Kidney Diseases, TRIAD's overall goal is to examine the influence of managed care structure on processes and outcomes of diabetes care. More information is available at <http://www.triadstudy.org/>.
- ***National Diabetes Laboratory***—Since 1997, the Centers for Disease Control and Prevention (CDC) has dedicated \$3 million annually to a National Diabetes Laboratory (NDL) to support emerging scientific efforts to help prevent and treat type 1 diabetes. CDC, National Center for Chronic Disease Prevention and Health Promotion, Division of Diabetes Translation, and the National Center for Environmental Health are collaborators on this project. For example, scientists are working to develop and evaluate laboratory technology for improving the measurement of genetic risk factors for type 1 diabetes and its complications, to study autoantibodies of type 1 diabetes, and to develop other projects that will improve the lives of people with type 1 diabetes. For more information, call toll-free 1-877-CDC-DIAB, e-mail diabetes@cdc.gov, or visit CDC's National Center for Environmental Health's National Diabetes Laboratory at <http://www.cdc.gov/nceh/dls/diabetes.htm>.
- ***Administration on Aging***—Evidenced-Based Disease Prevention Program: In 2003, the Administration on Aging launched a new grants program and a public/private partnership to increase older people's access to programs that have proven to be effective in reducing their risk of disease, disability and injury. One of the focus areas, disease self-management, funds community chronic disease efforts, including those for diabetes. For more information, please visit <http://www.aoa.gov/prof/evidence/evidence.asp>
- ***National Agenda for Public Health Action: A National Public Health Initiative on Diabetes and Women's Health***—This initiative offers recommendations to help health professionals, women and their families, health care systems, worksites, communities, and schools address the burden of diabetes among women. The Centers for Disease Control and Prevention is working with public- and private-sector partners to implement

the plan. More information is available at
<http://www.cdc.gov/diabetes/pubs/action/index.htm>.

- ***Take Time to Care About Diabetes***—This campaign developed by the Food and Drug Administration, Office of Women’s Health is intended to raise women’s awareness of the seriousness of diabetes and the importance of taking steps to treat the disease to avoid heart and kidney problems, blindness, stroke, or amputation of a lower limb. More information is available at
<http://www.fda.gov/womens/taketimetocare/diabetes/default.htm>.

**Appendix E:
Are You at Risk for Diabetes?**

DIABETES: YOU COULD BE AT RISK — TAKE THE TEST, KNOW YOUR SCORE!

Diabetes means your blood sugar (glucose) is too high. How would you know? Are you often thirsty, hungry, or tired? Do you urinate often? Do you have sores that heal slowly, tingling in your feet, or blurry eyesight? Even without these signs, you could still have diabetes.

Diabetes is a serious disease. It can cause heart attack or stroke, blindness, kidney failure, or loss of feet or legs. But diabetes can be controlled. You can reduce or avoid these health problems. Take the first step. Find out if you are at high risk.

Know your risk of having diabetes now. Answer these quick questions. For each Yes answer, add the number of points listed. All No answers are 0 points.

Question	Yes	No
Are you a woman who has had a baby weighing more than 9 pounds at birth?	1	0
Do you have a sister or brother with diabetes?	1	0
Do you have a parent with diabetes?	1	0
Find your height on the chart. Do you weigh as much as or more than the weight listed for your height?	5	0
Are you under 65 years old and get little or no exercise in a typical day?	5	0
Are you between 45 and 64 years old?	5	0
Are you 65 years old or older?	9	0
Add Your Score		

These questions are from the American Diabetes Association's on-line "Diabetes Risk Test" (<http://www.diabetes.org/info/risk/risktest.jsp>).

AT RISK WEIGHT CHART

Height	Weight (Pounds)	Height	Weight (Pounds)	Height	Weight (Pounds)
4'10.....	129	5'5.....	162	6'0.....	199
4'11.....	133	5'6.....	167	6'1.....	204
5'0.....	138	5'7.....	172	6'2.....	210
5'1.....	143	5'8.....	177	6'3.....	216
5'2.....	147	5'9.....	182	6'4.....	221
5'3.....	152	5'10.....	188		
5'4.....	157	5'11.....	193		

KNOW YOUR SCORE

If you scored . . .	then your risk is . . .
10 or more points	High for having diabetes now. Please bring this form to your health care provider soon. If you don't have insurance and can't afford a visit to your provider, contact your local health department.
3 to 9 points	Probably low for having diabetes now. Keep your risk low. If you're overweight, lose weight. Be active most days, and don't use tobacco. Eat low-fat meals with fruits, vegetables, and whole-grain foods. If you have high cholesterol or high blood pressure, talk to your health care provider about your risk for diabetes.

I SCORED 10 OR MORE — HOW CAN I GET TESTED FOR DIABETES?

If you have . . .	then do this . . .
Individual or group private health insurance	See your health care provider. If you don't have a provider, ask your insurance company about providers who take your insurance. Deductibles and co-pays will apply.
Medicaid	See your health care provider. If you don't have a provider, contact a state Medicaid office or contact your local health department.
Medicare	See your health care provider. Medicare will pay the cost if the provider has a reason for testing. If you don't have a provider, contact your local health department.
No insurance	Contact your local health department for more information about where you could be tested or call your local health clinic.

For more information, contact the Department of Health and Human Services, National Diabetes Education Program at 1-800-438-5383 or online at <http://www.ndep.nih.gov>.

SOURCE: U.S. Department of Health and Human Services, Diabetes Detection Initiative. Diabetes. You could be at risk—take the test—know your score! Available at: <http://www.ndep.nih.gov/ddi/resources/risktest.pdf> Adapted from the American Diabetes Association's risk assessment