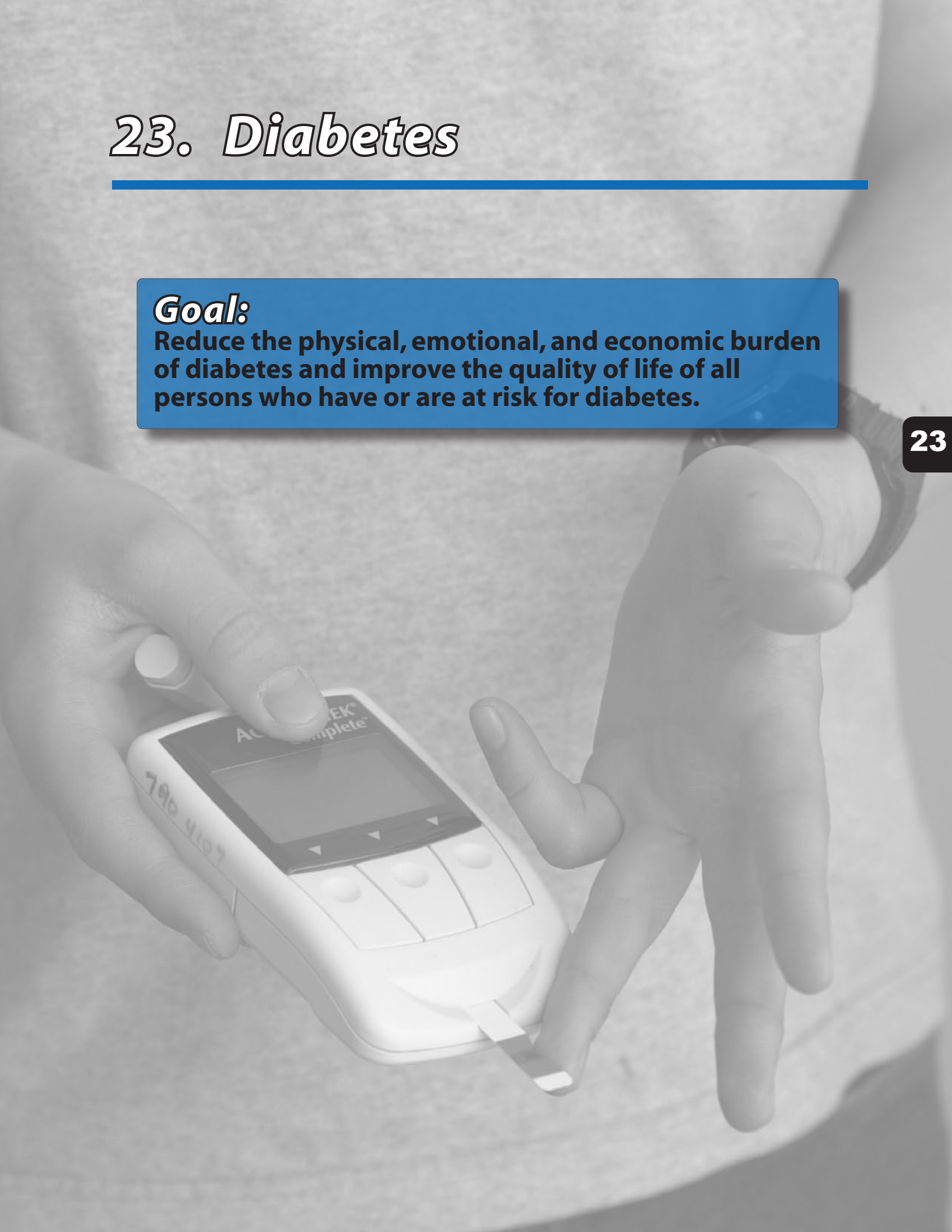# 23. Diabetes

Goal:
Reduce the physical, emotional, and economic burden of diabetes and improve the quality of life of all persons who have or are at risk for diabetes.

23. Diabetes

<table>
<tr><td colspan="6">Health Goal for the Year 2010: Reduce the physical, emotional and economic burden of diabetes and improve the quality of life of all persons who have or are at risk for diabetes.</td></tr>
<tr><td></td><td>Indicator</td><td>Alaska Data Source</td><td>U.S. Baseline</td><td>Alaska Baseline</td><td>Alaska Target Year 2010</td></tr>
<tr><td>1</td><td>Reduce deaths due to diabetes (diabetes as any cause of death, per 100,000 population).</td><td>ABVS</td><td>76 (1998)</td><td>73.7 (1999)</td><td>62</td></tr>
<tr><td></td><td>Alaska Native</td><td></td><td></td><td>63.2 (1999)</td><td>62</td></tr>
<tr><td>2</td><td>Reduce deaths from cardiovascular disease in persons with diabetes as a cause of death (per 100,000 population).</td><td>ABVS</td><td>33.2 (1999)</td><td>24.6 (1997-1999)</td><td>17</td></tr>
<tr><td></td><td>Alaska Native</td><td></td><td></td><td>17.3 (1997-1999)</td><td>17</td></tr>
<tr><td>3</td><td>Increase the proportion of people with diabetes who receive formal diabetes education.</td><td>BRFSS</td><td>45% (1998) NHIS</td><td>52% (2000)</td><td>60%</td></tr>
<tr><td>4</td><td>Prevent diabetes (new cases/1,000 persons/year).</td><td>Claims data</td><td>3.5 (1994-96) NHIS</td><td>Developmental</td><td>2.5</td></tr>
<tr><td>5</td><td>Increase the proportion of adults with diabetes whose condition has been diagnosed (adults aged 20 years and older with diabetes).</td><td>Claims data</td><td>68% (1988-94) NHANES</td><td>Developmental</td><td>80%</td></tr>
<tr><td>6</td><td>Reduce the rate of lower extremity amputations in persons with diabetes (per 1,000 persons with diabetes).</td><td>Hospital Discharge Survey (potential)</td><td>4.1 (1997)</td><td>Developmental</td><td>50% decrease from baseline</td></tr>
<tr><td>7</td><td>Increase the proportion of adults aged 18 or older with diabetes who have at least an annual foot examination.</td><td>BRFSS</td><td>55% (1998)</td><td>79% (1999)</td><td>80%</td></tr>
<tr><td>8</td><td>Maintain the proportion of adults aged 18 or older with diabetes who have a glycosylated hemoglobin measurement at least once per year.</td><td>BRFSS</td><td>24% (1998)</td><td>80% (1999)</td><td>80%</td></tr>
<tr><td>9</td><td>Increase the proportion of adults with diabetes who have an annual dilated eye examination.</td><td>BRFSS</td><td>56% (1998)</td><td>65% (1999)</td><td>80%</td></tr>
<tr><td>10</td><td>Increase the proportion of persons over 2 years of age with diabetes who have visited a dentist or dental clinic within the past year.</td><td>BRFSS</td><td>58% (1997) NHIS</td><td>70% (1999)</td><td>75%</td></tr>
<tr><td>11</td><td>Increase the proportion of adults aged 18 or older with diabetes who perform self-blood glucose monitoring at least once daily.</td><td>BRFSS</td><td>42% (1998)</td><td>65% (1999)</td><td>75%</td></tr>
</table>

ABVS - *Alaska Bureau of Vital Statistics*

BRFSS - *Alaska Behavioral Risk Factor Surveillance System. All U.S. BRFSS data are age-adjusted to the 2000 population; the Alaska BRFSS data have not been age adjusted, so direct comparisons are not advised. See Technical Notes.*

NHIS - *National Health Interview Survey*

NHANES -*National Health and Nutrition Examination Survey*

Overview

Diabetes is a chronic disease that usually manifests itself as one of two distinct categories. Type 1 diabetes is most often seen in children and adolescents 18 years and younger and requires exogenous insulin to sustain life. Type 1 diabetes accounts for 5 percent to 10 percent of all diagnosed cases of diabetes.[1]

Type 2 diabetes usually occurs in adults over age 30 years and develops as a result of the body's inability to use its own limited amount of insulin effectively. Type 2 diabetes accounts for 90 percent to 95 percent of all diagnosed cases. Risk factors for type 2 diabetes include older age (40 plus years), obesity, family history of diabetes, prior history of gestational diabetes, impaired glucose tolerance, physical inactivity, and race/ethnicity.

Diabetes is the leading cause of blindness and end-stage renal disease in adults. Diabetes increases the risk of heart disease, stroke, and many infectious diseases. Nerve damage from diabetes is the leading cause of lower extremity amputations.

Type 2 diabetes is more common in women than men. Incidence increases with age, and the prevalence of diabetes in the United States is expected to increase as the population ages and diabetics live longer.

The prevalence of diabetes, complications of diabetes, and deaths from diabetes are higher among Hispanics and African Americans than among white Americans. High rates of diabetes are also seen in some Asian and Pacific Island and American Indian/Alaska Native groups.

Issues and Trends in Alaska

The prevalence of diabetes in Alaska is measured among adults using the Behavioral Risk Factor Surveillance System (BRFSS). Approximately 14,800 Alaskans report that they have diagnosed diabetes, 3.4 percent of the population 18 and over. The incidence of diabetes increases with age, and approximately 12 percent of the Alaska population over 65 has been diagnosed with diabetes. In 2000, the age-adjusted diabetes prevalence in Alaska was lower than the United States as a whole (38 per 1000 vs. 61 per1000), but is likely to increase in the future.[2]

The highest prevalence of diabetes in Alaska is found among African Americans (4.6%) and Hispanics (4.4%).[3] American Indians and Alaska Natives are also at increased risk for diabetes, but prevalence varies significantly among tribes. Alaskan tribes had the lowest prevalence of tribes surveyed by the Indian Health Service in 1997. Among Alaska Native groups, diabetes prevalence is highest in Aleuts and lowest in Eskimos.[4]

The overall prevalence of diabetes among Alaska Natives is currently similar to that of whites. However, diabetes has increased among Alaska Natives over the past decade as a shift has occurred from a traditional lifestyle to a western lifestyle with accompanying increases in body weight, decreases in physical activity, and changes in diet. The prevalence of diabetes among Alaska Natives continues to increase at a higher rate than that of the United States as a whole.[4,5]

Death rates among people with diabetes are two to four times greater than for people without diabetes, especially from cardiovascular disease. Trend data in Alaska show an increase for diabetes as the underlying or other mentioned cause of death over the past decade (Figure 23-1).[6]

Figure 23-1

Cancer Screening in Alaska, 1999

Source: Behavioral Risk Factor Surveillance System
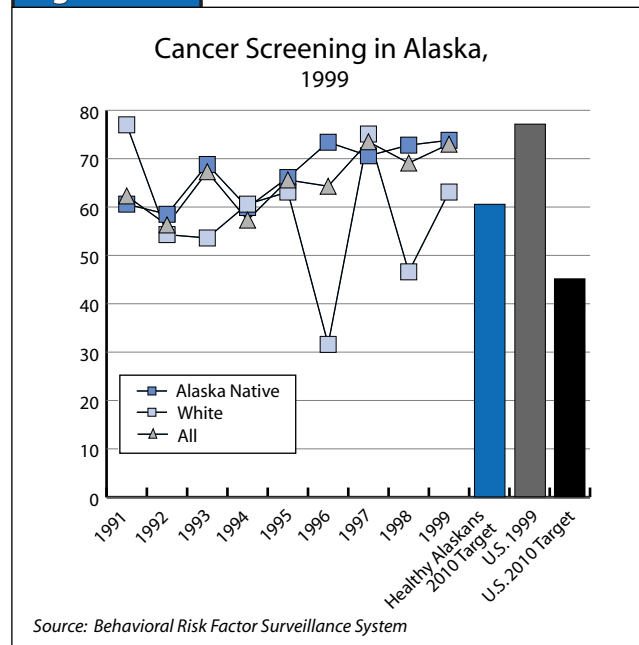
The occurrence of diabetes, especially type 2 diabetes, as well as the complications associated with diabetes, is increasing. Over the past decade, diabetes has remained the leading cause of adult blindness, end-stage renal disease, and non-traumatic lower limb amputa-

tions. The United States Centers for Disease Control and Prevention (CDC) estimate that among people with diabetes in Alaska, there are annually 70 lower extremity amputations, 17 new cases of end-stage renal disease, and 20 to 60 new cases of blindness.[7] These and other health problems associated with diabetes contribute to impaired quality of life and substantial disability among people with diabetes.

The toll of diabetes on the health status of people in Alaska is expected to worsen before it improves. This is especially true in vulnerable, high-risk populations such as African Americans, Hispanics, Alaska Natives, Asians, and Pacific Islanders, the elderly, and the poor. Several factors account for the increasing burden of diabetes in the population: behavior (improper nutrition, decreased physical activity, and obesity), demographic changes (aging, increased growth of at risk populations), and improved ascertainment and surveillance systems that more completely capture the actual burden of diabetes. Other related factors are genetics, cultural and community traditions, and socioeconomic status.

Overweight and obesity: "Westernization," which includes a diet high in fat and processed foods as well as total calories, has been associated with a greater number of overweight persons in Alaska. Alaska has not met its goal of decreasing the percentage of adults who are overweight to less than 20 percent. Between 1991-98, the prevalence of obesity increased by 57 percent (see Chapter 2, Figure 2-1). Because obesity is a risk factor for type 2 diabetes, the increased prevalence of obesity in the population is expected to lead to an increase in diabetes.[8]

Physical Activity: Physical activity is essential for a healthy life. Regular physical activity protects against type 2 diabetes as well as heart disease, high blood pressure, cancer, depression and anxiety. Increasing evidence suggests that moderate physical activity can have significant health benefits for people with diabetes. Alaska has not met its goal of decreasing the proportion of Alaskans with a sedentary lifestyle to below 30 percent and the proportion with no physical activity to below 15 percent. Among Alaskan adults with diabetes, only 38 percent exercise regularly.[1]

Demographics: The prevalence of diabetes increases with advancing age. Increased insulin resistance and gradual deterioration in the function of insulin-producing cells may account for the increased prevalence with advancing age. Approximately 3,600 (11%) of the Alaska population over 65 years of age have diagnosed diabetes. Since 1980, the population 65 years and older has more than tripled (11,517 in 1980 to 35,699 in 2000). The number of people between the ages of 55 to 64 years has more than doubled since 1985 (20,713 in 1985 to 44,750 in 2000). This age group is expected to grow rapidly over the next 10 years as baby boomers begin to enter their mid-fifties.[8] As the population in Alaska ages, the number of people with diabetes is expected to increase.

Diabetes disproportionately affects certain racial/ethnic groups, including African Americans, Hispanics, Asian and other Pacific Islanders, and Alaska Natives and American Indians. Growth in these Alaskan populations at risk for diabetes is expected to increase the public health burden of diabetes in the future.

Ascertainments: It is estimated that diabetes is undiagnosed in approximately one-third of all cases. In addition, complications and health services associated with diabetes are frequently not recorded on death certificates, hospital discharge forms, emergency department paperwork, and other documents. Much of this "missing" burden of diabetes will be better captured with improved surveillance, data systems and screening programs for undiagnosed diabetes in high-risk populations.

Limitations in programs to change behaviors: Behaviors are influenced by beliefs and attitudes, and these are greatly affected by community and cultural traditions. In many racial and ethnic communities, fatalism, use of alternative medicine, desirability of rural living conditions, lack of economic resources, and other factors influence both the availability of health care and the capacity of persons with diabetes to manage their disease. People with diabetes spend a small percentage of their time in contact with health professionals. The ability to understand and influence individual, community, and organizational behaviors significantly influences the success of preventive programs in diabetes.

Current Strategies and Resources

The State of Alaska Diabetes Control Plan details state and community strategies for diabetes prevention and the reduction of complications associated with diabetes.[9]

Diabetes education is uniformly viewed as effective and economical in the ultimate prevention of long-term complications of diabetes. An informed and motivated individual with diabetes is essential in managing the disease and reducing the risk of complications.

Evidence suggests diabetes can be prevented or delayed through physical activity and weight management. Given the seriousness and costs associated with diabetes and the complexities of the disease, factors that account for increasing frequency of diabetes should be identified.

Type 2 diabetes, the most prevalent form of diabetes, is often asymptomatic in its early stages and can remain undiagnosed for many years. Because early detection and prompt treatment may reduce the burden of type 2 diabetes and its complications, screening for diabetes is recommended for people over 40 and younger people with risk factors such as obesity.

People with diabetes experience death rates two to four times greater than people without diabetes, especially from cardiovascular disease. Other causes of death include renal failure, diabetic acidosis, and infection. Studies have clearly indicated that secondary and tertiary prevention can reduce overall cardiac-related illness, disability, and death. Death rates are complicated by how accurately and completely diabetes is recorded on death certificates. Attention to prevention behaviors to delay or prevent death, as well as death rates, should be examined carefully.

Cardiovascular disease is the leading cause of death among people with diabetes, accounting for half of all deaths. Preventing cardiovascular disease by reducing cardiovascular risks, (i.e., uncontrolled hypertension, cigarette smoking, and elevated cholesterol) could have a major impact on diabetes mortality. The target measure of a 10 percent reduction in cardiovascular deaths for 2010 was selected as a reasonable target because effects may not be independent and risk factor reductions will not immediately reduce mortality.

Amputations are a major cause of morbidity, disability, and costs for people with diabetes. Early recognition and management of risk factors for ulcer and amputation can prevent or delay the onset of adverse outcomes.

Monitoring of glycemic status, such as performed by people with diabetes and health care providers, is considered a cornerstone of diabetes care. Using self-monitoring of blood glucose, people with diabetes can work to achieve and maintain specific glycemic goals. There is broad consensus on the health benefits of normal or near-normal blood glucose levels to prevent or postpone diabetes-related complications. Results of monitoring are used to assess the efficacy of therapy and to guide adjustments in medical nutrition therapy, exercise, and medications to achieve the best possible blood glucose control.

Studies indicate that retinopathy can be prevented or delayed and the progression of retinopathy can be slowed, through improved glycemic control. A dilated eye exam every year is the best approach to screening for diabetic retinopathy.

People with diabetes are at increased risk for destructive periodontitis and subsequent tooth loss. In addition, untreated periodontitis in persons with diabetes may complicate glycemic control. Regular dental visits provide opportunities for prevention, early detection, and treatment of periodontal problems in persons with diabetes.

Data Issues and Needs

The revised diabetes module will be included in the 2000 Alaska Behavioral Risk Factor Surveillance System (BRFSS) and yearly thereafter. Nationally, the National Health Interview Survey will be used, but these data are not available at a state level. It is expected the sample size of people with diabetes will remain small and may require multiple years of data collection before analysis provides meaningful information.

Data on the general population of people with diabetes is difficult to ascertain in Alaska, with the exception of beneficiaries of the Indian Health Services. The Alaska Area Diabetes Model Program maintains a diabetes registry and actively monitors care and preventive practices for Alaska Native beneficiaries. This is much more difficult to accomplish among the remaining 84 percent of the population. Surveillance of diabetes in Alaska will require the use of a hospital discharge data system.

Related Focus Areas

A variety of objectives in other *Healthy Alaskans* chapters are linked to objectives in *Diabetes*.

- *Physical Activity*
- *Nutrition*
- *Oral Health*
- *Vision and Hearing*
- *Heart Disease and Stroke*

Increasing physical activity and fitness would decrease the future prevalence of diabetes. Indicators from *Nutrition and Overweight*, such as increasing fruit and vegetable intake and reducing total fat intake, can help reduce the chances of developing diabetes. People with diabetes are at increased risk for destructive periodontitis and subsequent tooth loss. Regular dental visits provide opportunities for prevention, early detection, and treatment of periodontal problems in persons with diabetes. People with diabetes are more likely to develop heart disease, so screening for high blood pressure and cholesterol will decrease the number of people with diabetes who die from related causes. *Diabetes* is linked to *Vision and Hearing* since people with diabetes often develop diabetic retinopathy.

Endnotes

[1] American Diabetes Association. Clinical practice guidelines. Diabetes Care 2000; 22, Suppl. 1 S1 – S115.

[2] Alaska Department of Health and Social Services, Alaska Division of Public Health, Section of Epidemiology. Diabetes in Alaska, 1991-2000: Results from the Behavioral Risk Factor Surveillance System. Bulletin; 5(4), December 20, 2001.

[3] Alaska Department of Health and Social Services, Alaska Division of Public Health, Section of Community Health and Emergency Medical Services. Alaska Behavioral Risk Factor Surveillance System, 2000.

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[5] Gohdes D. Diabetes in North American Indians and Alaska Natives. Diabetes in America 1995 (NIH, publication No. 95-1468) p. 683 – 702. Bethesda: MD.

[6] Alaska Bureau of Vital Statistics. Alaska Bureau of Vital Statistics 1998 Annual Report, June 2000.

[7] Centers for Disease Control and Prevention. Diabetes in the United States: A Strategy for prevention, 1994.

[8] Alaska Department of Labor. Alaska Population Overview 1999 estimates, p. 52, Table 1.22.

[9] Alaska Department of Health and Social Services, Alaska Division of Public Health, Section of Epidemiology. Alaska Diabetes Control Program: State of Alaska Diabetes Control Plan. November 1999.

References and Sources

Alaska

Alaska Area Diabetes Model Program	www.ihs.gov/MedicalPrograms/Diabetes/alaskamodel.asp
American Diabetes Association Alaska Information	www.diabetes.org/main/community/outreach/education/ak/info.jsp
DHSS: Section of Epidemiology Alaska Diabetes Program	www.epi.hss.state.ak.us/programs/chronic/diabetes.stm

National

Diabetes in Alaska Natives and American Indians	www.niddk.nih.gov/health/diabetes/pubs/amindian/amindian.htm
Diabetes: Guide to Community Preventive Services	www.cdc.gov/diabetes/projects/community.htm
Joslin Diabetes Center	www.joslin.harvard.edu/
National Diabetes Information Clearinghouse	www.niddk.nih.gov/health/diabetes/pubs/dmover/dmover.htm
Make the Link! Diabetes, Heart Disease, and Stroke	www.diabetes.org/main/info/link.jsp

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Chapter Notes