

California Food Guide

Diabetes

By Lucia Kaiser Ph.D, R.D. and Rae Lynne Lee M.P.H., R.D.



What's New

Diabetes rates have reached epidemic proportions.

- The number of people with diabetes in California is expected to double by the year 2020. In 2003 it was estimated that 6.6 percent of the adult population had diabetes.¹ As of 2001, more than 12,000 adolescents had type 2 diabetes.²
- The number of children, adolescents, and adults with diagnosed and undiagnosed pre-diabetes is increasing.
- Type 2 diabetes now affects a growing number of children and adolescents.
- The burden of diabetes falls disproportionately on women.³
- 32.8 percent of boys and 38.5 percent of girls born in 2000 will develop diabetes.⁴
- Modest improvements in weight, a low fat, high fiber diet, and regular physical activity are all aspects of prudent advice to prevent pre-diabetes and type 2 diabetes.
- The theory of the fetal origins of chronic disease is being accepted as a possible factor in life time risk for diabetes (see page 3, Incidence and Prevalence).
- Breastfeeding appears to decrease the risk of obesity/overweight and type 2 diabetes in some populations;^{5, 6} and, may be an independent protective factor against development of type 1 diabetes.^{7, 8}
- Breastfeeding exclusively for the first 6 months and continuing for the first year of life, reduces the risk of being overweight or risk of overweight among preschool children.⁹ Since obese children are at risk for becoming obese adults, breastfeeding may play a critical role in reducing the prevalence of cardiovascular disease and other adult diseases related to obesity.^{8, 10, 11, 12}

Public Health Implications

- Diabetes is a chronic disease that can be controlled and complications delayed or avoided. Consistent self management and access to quality diabetes care are essential.¹³
- Diabetes is a silent killer. Chronic hyperglycemia is the leading cause of adult blindness, kidney failure, and amputations and is a contributor to heart attacks and strokes.¹³ Many people first become aware that they have diabetes when they develop one of its life-threatening complications.

Public Health Implications Continued

- Diabetes and associated complications are a major public health problem.
- Diabetes is becoming more prevalent in all age groups due to unhealthy lifestyle habits and higher detection. Women are at increased risk.
- Of primary concern are the increased rates of overweight and obesity from unhealthy lifestyle habits, including, but not limited to, poor food choices, physical inactivity, and choosing not to breastfeed an infant.
- Complementary and alternative medicines, supplements and treatments may be used more frequently by people with diabetes.
- Objectives for Healthy People 2010 diabetes,* diabetes related and diabetes prevention topics include:
 - Chapter 5 Diabetes
 - Chapter 4 Kidney Disease
 - Chapter 12 Heart Disease and Stroke
 - Chapter 16 Maternal, Infant and Child Health
 - Chapter 18 Mental Health and Mental Illness
 - Chapter 19 Nutrition and Overweight
 - Chapter 21 Oral Health
 - Chapter 22 Physical Activity and Fitness
 - Chapter 28 Vision and Hearing

*<http://www.healthypeople.gov/document/tableofcontents.htm#parta>

“Diabetes mellitus is a group of metabolic diseases, characterized by hyperglycemia resulting from defects in insulin secretion, insulin action or both.”¹⁴ The two major forms of diabetes are called type 1 and type 2, and both cause similar kinds of complications. Gestational Diabetes Mellitus (GDM) is an early indication of glucose intolerance, as is pre-diabetes and/or impaired glucose tolerance (IGT).

- Type 1 diabetes is caused by a failure of the pancreas to make insulin due to the autoimmune destruction of the insulin producing beta cells and accounts for about 5-10 percent of all cases of diabetes. Those with type 1 diabetes must take insulin to survive and perform multiple daily blood glucose (sugar) tests to assist with treatment decisions.¹⁵
- Type 2 diabetes, due to insulin resistance and relative insulin deficiency, accounts for 90-95 percent of all cases of diabetes. Risk increases with age, obesity and a sedentary lifestyle. Weight reduction, using a low-fat, high-fiber diet, and increased physical activity, have been shown to reduce the risk of developing type 2 diabetes and to slow its progression.¹⁵
- Gestational Diabetes Mellitus (GDM) is also an important form of diabetes with onset or first recognition during pregnancy. GDM complicates approximately seven percent of all pregnancies in the United States and is a risk factor for later development of type 2 diabetes for the mother and her offspring. The percentage of

women with GDM in California is greater because of the presence of high risk ethnic groups.¹⁵

- Pre-diabetes can lead to type 2 diabetes which was formerly called Impaired Glucose Tolerance (IGT) or Impaired Fasting Glucose (IFG). People with pre-diabetes have a 1 in 3 chance of developing type 2 diabetes within ten years, but this can be delayed or prevented through weight management by healthy eating and physical activity.

Burden

Since diabetes can damage almost every major organ and shorten life span by an average of ten to 15 years, the human and economic implications of this trend are profound. In 2000, diabetes contributed to the deaths of 24,510 Californians. Because diabetes is a contributor to mortality, this is likely to be an underestimation. It is estimated that the direct and indirect cost of diabetes in California per year is over \$17.9 billion.¹³

“Long-term complications of hyperglycemia include retinopathy with potential loss of vision; nephropathy leading to renal failure; peripheral neuropathy with risk of foot ulcers, amputations, and Charcot joints; and autonomic neuropathy causing gastrointestinal, genitourinary and cardiovascular symptoms, and sexual dysfunction. People with diabetes have an increased incidence of atherosclerotic cardiovascular, peripheral arterial, and cerebrovascular disease. Hypertension and abnormalities of lipoprotein metabolism are often found in people with diabetes.”¹⁴

Incidence and Prevalence

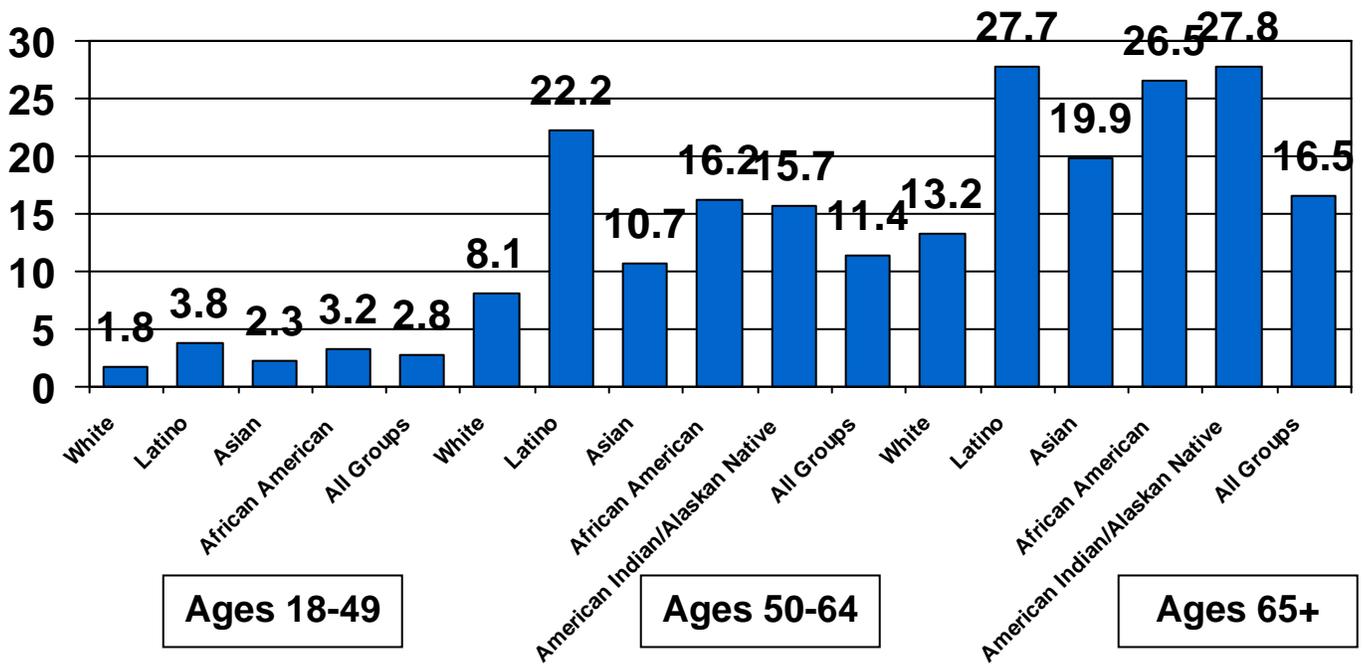
In 2003 it was estimated that 6.6 percent of the adult population had diabetes.¹ As of 2001, more than 12,000 adolescents had type 2 diabetes.² Diabetes is a particular health challenge because about one-third of all people with diabetes are undiagnosed. The prevalence of diabetes is highest among adults 50 years and older, particularly African American, American Indian/Alaska Native, and Latino adults (see Table 1). In California, other groups with high rates of diabetes include adults who never attended high school, have incomes below 100 percent of the Federal Poverty Level, and/or live in rural areas of the state. Gestational diabetes, pre-diabetes and type 2 diabetes are all part of the cycle of diabetes. The fetal origins of chronic disease theory recognizes that prenatal exposure to a hyperglycemic environment adversely affects fetal islet cell function in the pancreas which can lead to childhood obesity and pre-diabetes during the child's adolescence. This then predisposes adult impaired islet cell function and GDM for their offspring.¹⁶

Table 1: Diabetes Prevalence by Race/Ethnicity, Adults Ages 18 and Over, California, 2003¹

Race/Ethnicity	Diabetes Prevalence %	Percentage Point Change from 2001
White	5.6	0
Latino	7.5	+0.7
Asian	6.4	+1.4*
African American	9.3	-1.2
American Indian/Alaska Native	9.9	+0.9
All Adults	6.6	+0.4*

* Significant change from 2001

Table 2: Diabetes Prevalence by Age and Race/Ethnicity, Adults Ages 18 and Over, California, 2003¹



Trends/Contributing Factors

Between 1990-98, California experienced an estimated increase of 67 percent in the prevalence of diabetes.¹⁷ This trend in California, also observed nationwide, is probably due to the obesity epidemic, because excess body weight is a major risk factor for type 2 diabetes, which accounts for 90 percent or more of all cases of diabetes. Complex social, economic, and environmental factors also contribute to the increased morbidity and mortality of obesity and diabetes.

As of 2003 In California, Imperial County has the highest proportion of residents with diabetes at 11.2 percent and Marin and Nevada/Plumas/Sierra Counties have the lowest proportion of residents with diabetes at 3.1 and 2.7 percent, respectively.¹⁸ It is estimated that only 70 percent of people with diabetes have been clinically diagnosed.¹⁹

Barriers to Implementation/Myths

There is a significant amount of published literature and on-going research that describes the impact of social, economic, and environmental factors on morbidity and mortality from chronic disease, including the specific relationship of these factors to the prevalence of diabetes. Although we know that there is a genetic risk associated with diabetes, that alone does not explain the recent serious increase in diabetes. Many factors contribute to the increase in diabetes morbidity and mortality, including being female, social, economic, and environmental conditions such as lack of health insurance, limited access to high quality, culturally and linguistically appropriate health care; and factors that influence nutrition and physical activity.⁴

There are multiple and complex social and environmental factors that influence individual choices and behavior changes regarding eating and physical activity that play a particularly important role in the growing epidemics of both diabetes and obesity. Some of these factors are, the trend to larger portions of low cost, high-calorie foods and beverages; multi-billion-dollar advertising and marketing of unhealthful products; limited opportunities for physical activity in schools and communities; limited access to healthful foods in low-income neighborhoods; increased television viewing and computer use.⁴

Common Concerns/Strategies

Primary Prevention:

- Type 2 diabetes may be prevented or postponed by weight management through routine physical activity and proper nutrition.¹⁵ A diet that is low in fat and high in fiber is particularly beneficial.
- Breastfeeding appears to be a factor in the prevention of obesity, overweight and type 2 diabetes.^{5,6,8,9,10,11,12,20}
- Breastfeeding may be a factor in preventing type 1 diabetes.^{7,8}
- Early diagnosis and the appropriate treatment of:
 1. Overweight and obesity can prevent or postpone the onset of type 2 diabetes.
 2. Pre-diabetes can prevent or postpone the onset of type 2 diabetes.
 3. Gestational diabetes mellitus can prevent or postpone the onset of pre-diabetes and type 2 diabetes for both the mother and her offspring.

Secondary Prevention:

- Implement evidence-based guidelines for basic diabetes care for all people with established diabetes to prevent or delay recurrent events or disease progression.

- Regulation of blood glucose to achieve near-normal levels is a primary goal.²¹
- Follow the American Diabetes Association’s “Standards of Medical Care in Diabetes.” These are updated every January in the Clinical Practice Recommendations: http://care.diabetesjournals.org/content/vol29/suppl_1/
- Utilize and share California specific diabetes resources and website links that are available from the California Diabetes Program’s Diabetes Information Resource Center (DIRC) at <http://www.caldiabetes.org/>.
- Refer people with diabetes to disease management and treatment programs where diabetes care is provided by a team of health care professionals including a doctor, a dietitian, a nurse, a diabetes educator, a behavioral medicine specialist, and other multi-specialty health care providers. The team acts as advisors to the person with diabetes, helping him/her develop an individualized self-management plan. This will include meal planning, planned physical activity, blood glucose monitoring, taking diabetes medicines, identifying and treating depression, handling episodes of illness, identifying low and high blood glucose, managing diabetes when traveling, and more.
- Recognize that modest improvements in weight, a low fat, high fiber diet, and regular physical activity are all aspects of prudent advice to prevent pre-diabetes and type 2 diabetes. Specific dietary advice for treatment of diabetes is beyond the scope of the California Food Guide. The American Diabetes Association stresses an individualized approach that includes assessing the individual’s metabolic parameters and lifestyle factors, identifying goals, designing interventions to achieve these goals, and evaluating outcomes. A registered dietitian working in collaboration with an individual’s primary care provider can develop an individualized medical nutrition therapy (MNT) plan. A registered dietitian can be located through: <http://www.eatright.org/Public/>

Opportunities for Improvement

It is a critical time for California communities and policy makers. The prevalence of diabetes is increasing dramatically. The state’s diabetes related death rate – already higher than that of the nation as a whole – is rising. The state’s racial and ethnic diversity means a growing number of Californians will be at risk for developing diabetes. There are increasing numbers of children and adults who are overweight or obese, which indicates an even greater increase in the prevalence of diabetes in the years to come. The frightening emergence of type 2 diabetes among children is the unmistakable warning sign that generations of California children will suffer from preventable chronic health conditions at rates higher than ever before.⁴

Action must be taken or millions of Californians – both children and adults – will be sentenced to a future of chronic health problems, overweight, obesity, and early death. In addition to the human suffering, California families and businesses will face unparalleled increases in long-term health costs, and the public health care system is likely to be stretched beyond its capacity.

Calling for individual behavior change alone will not solve the epidemic. Instead legislators and policy makers should be encouraged to address the community and environmental factors that perpetuate the epidemic. California's Plan for Diabetes: A Coordinated Plan to Help Guide our Work in Diabetes indicates that policies should be established that employ the following strategies to reduce diabetes-related deaths in California:¹⁵

- Ensure access to health care to prevent, delay, treat, and manage the diabetes.
- Create healthy nutritional and physical activity environments that promote healthy lifestyles and weight management.
- Place special emphasis on racial/ethnic and geographic communities experiencing the greatest burdens of diabetes.⁴
- Promote breastfeeding as the normal method of infant feeding in California for at least the first year of life in order to provide proven benefits to the mother, infant, and society.
- Reduce the burden of diabetes in future generations.
- End discrimination against people with diabetes.
- Develop collaborative relationships with non-traditional partners, such as the food and entertainment industries.
- Broaden and increase collaboration within state and local agencies and departments.
- Significantly increase the Federal and State commitment to cure, prevent, and control diabetes.

Clinical Implications

- Prevention is considered a more cost-effective and desirable strategy than treatment of type 2 diabetes.²²
- Appropriate screening, diagnosis, case management, and self-management education will improve clinical outcomes.
- There is a cycle of diabetes from mother to child to mother. Intervention should begin prior to conception and continue during the prenatal and postnatal periods.¹⁶
- Families and communities, in particular high-risk populations, must be targeted for education regarding diabetes prevention and management.
- Clinical assessment should include queries about the use of complementary and alternative medicines and treatments in the care and management of diabetes.

Resources/Web Sites

- American Diabetes Association (ADA) www.diabetes.org
- American Dietetic Association (ADA) www.eatright.org
- Behavioral Diabetes Institute <http://www.behavioraldiabetes.org>
- California Center for Public Health Advocacy www.publichealthadvocacy.org
- California Diabetes Program ((CDP) www.caldiabetes.org
 - Diabetes Information Resource Center (DIRC)
 - Basic Guidelines for Diabetes Care
 - California's Plan for Diabetes
- California Diabetes and Pregnancy Program (CDAPP), Sweet Success www.llu.edu/llumc/sweetsuccess
- Center for Weight & Health, University of California, Berkeley, College of Natural Resources <http://nature.berkeley.edu/cwh/>
- Centers for Disease Control and Prevention (CDCP) www.cdc.gov/diabetes/
- Diabetes in California – African Americans <http://www.healthpolicy.ucla.edu/pubs/publication.asp?pubID=80>
http://www.healthpolicy.ucla.edu/pubs/files/AfrAm_Diabetes_FactSheet.pdf
- Diabetes in California – Latinos <http://www.healthpolicy.ucla.edu/pubs/publication.asp?pubID=73>
- Diabetes in California – American Indians and Alaska Natives <http://www.healthpolicy.ucla.edu/pubs/publication.asp?pubID=81>
- Healthy People 2010 <http://www.healthypeople.gov>
- Lumetra <http://www.lumetra.com>
 - Improve Preventive Care
 - Diabetes Resource Guide for Quality Improvement 2004
- National Diabetes Education Program, National Institute of Health <http://ndep.nih.gov>
- National Institute of Diabetes & Digestive & Kidney Disease (NIDDK) <http://www.niddk.nih.gov>

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