Withdrawal/Redaction Sheet
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DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
001. list	Tribal Delegation Accompanying Principal Chief Joyce Dugan ; Social Security numbers redacted (1 page)	8/7/97	P6/b(6)

COLLECTION:
Clinton Presidential Records
Domestic policy Council
Chris Jennings (Subject File)
OA/Box Number: 23756 Box 7

FOLDER TITLE:
Diabetes [1]

gf15

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P1 National Security Classified Information [(a)(1) of the PRA]
P2 Relating to the appointment to Federal office [(a)(2) of the PRA]
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Freedom of Information Act - [5 U.S.C. 552(b)]

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Diabetes File

Diabetes 2 Dg Fact Sheet

NEW DIABETES INVESTMENTS TO IMPROVE TREATMENT, PREVENTION, AND RESEARCH FOR AMERICANS WITH DIABETES

Today President Clinton highlighted a set of four initiatives that will improve the lives of the at least 8 million Americans who have been diagnosed with diabetes. Three of these initiatives were included in the balanced budget the President signed into law on Tuesday. The President also emphasized that this new investments emerged as a result of a strong bipartisan partnership with Speaker Gingrich. The American Diabetes Association (ADA) stated that "taken together, these new investments in diabetes, announced by President Clinton today, are as important for people with diabetes as the discovery of insulin in the 1921." The President announced:

(1) **An important new Medicare benefit** which will help pay for the critically necessary supplies and self-management instruction which will help the 3.2 million older Americans who suffer from diabetes better manage their treatment.

(2) **A new $150 million investment in diabetes research to prevent and cure Type I (often known as juvenile) diabetes,** to be allocated by Health and Human Services Secretary Donna Shalala.

(3) **A new $150 million investment for prevention and treatment of diabetes among Native Americans**, who are almost three times as likely to suffer from the disease as others in the U.S. population;

(4) **A new public/private effort to assure and improve high quality care for Americans with diabetes.** This effort will review current treatments for diabetes to determine the degree to which they are effective, to recommend alternative approaches that ensure high quality care, and to develop more consistent quality measures for diabetes patients, health plans, and health providers across America.

A New Medicare Benefit to Help People With Diabetes Better Manage Their Care.
The balanced budget expands Medicare's coverage of benefits for people with diabetes by $2.1 billion over five years. In so doing, it expands the number of people able to take advantage of self-management tools will increase the number of Americans who properly manage their diabetes, thereby helping to prevent the debilitating and costly complications too often associated with the disease. Under the new balanced budget, Medicare will cover self-management training offered by physicians and other certified providers rather than only in hospital-based programs as it traditionally has. This will help ensure that more beneficiaries with diabetes can access the necessary education to manage this disease. In addition, Medicare will make blood glucose monitors (including testing strips) available to all beneficiaries with diabetes, whereas Medicare currently covers only insulin-dependent patients. Ensuring Medicare beneficiaries have access to these supplies will help improve their treatment and has great potential to reduce costs. This new legislation was introduced and strongly advocated by Rep. Furse, Rep. Nethercut, and Senator Breaux.

A New $150 Million Investment to Help Research a Cure for Type I (Juvenile) Diabetes.
The HHS Secretary is allocated $30 million annually for five years for research to help find the cure for diabetes. Americans with Type I diabetes with this disease often suffer severe consequences, even when they receive the best treatment and care. The HHS Secretary will have discretion to target the new funds to the best scientific opportunities. This represents the largest single new investment in Type I diabetes.

$150 Million Investment to Help Prevent and Treat Diabetes Among Native Americans. The HHS Secretary is allocated $30 million annually for five years to be used to provide services for diabetes prevention and treatment for Native Americans. The death rate from diabetes is almost three times higher in the Native American population than in the U.S. population as a whole. This new funding will go to help improve prevention efforts (such as improved diet, exercise and other factors that reduce the likelihood of diabetes) and help identify the disease as early as possible. It will also help more Native Americans with diabetes get the necessary information about managing diabetes, for example, by improving linkages between families, public health services, schools, and nutrition programs. Moreover, it will expand access to affordable treatment so that more Native Americans get the care they need to help reduce costly and extensive complications. IHS will work in partnership with Tribes, Urban Indian Health Centers Facilities, and other agencies within HHS, such as the CDC.

A New Diabetes Quality Improvement Project.
Numerous studies by organizations such as the ADA and National Committee on Quality Assurance (NCQA) have shown that many patients are not receiving the medical care known to reduce diabetes complications such as blindness and amputation. In fact, an NCQA study shows that the rate of an annual eye exam in managed care plans averages less than 40 percent. The multiplicity of report cards, each with their own measures, has created confusion and made it difficult to compare and improve care across all delivery systems.

The President announced a major year-long collaborative effort to review current treatments for diabetes to determine the degree to which they are effective, to recommend alternative approaches that ensure high quality care, and to develop more consistent quality measures for diabetes patients, health plans, and health providers across America. Such measures will monitor whether proper care was delivered (for example, an annual eye exam) or health outcomes were achieved (such as appropriate blood glucose levels).

The performance and outcome measures are being developed by a coalition of four organizations: HCFA, the largest purchaser of health care for the diabetic population; the ADA, the largest voluntary health agency dedicated to improving the lives of people with diabetes; NCQA, which develops and maintains a set of standardized performance measures used by more than 90 percent of health plans; and the Foundation for Accountability (FACCT), an organization dedicated to ensuring that consumers have adequate information to make health care decisions. Together, these organizations will work to ensure that millions of consumers, purchasers, and health care providers utilize this new information to improve care.

Diabetes Q & A's

DIABETES Q&As

Q: WHY ARE YOU INVESTING $30 MILLION ANNUALLY OVER FIVE YEARS IN TYPE I DIABETES WHEN ONLY A SMALL PORTION OF THE DIABETES POPULATION HAS THIS DISEASE?

A: Increasing our research efforts for Type I diabetes will actually help improve our knowledge about all types of diabetes. In fact, currently NIH does not even distinguish between their research dollars spent on Type I and Type II diabetes.

This initiative, which allows the HHS Secretary to allocate $30 million annually for five years to research a cure for Type I diabetes, however, could make a significant difference in how scientists understand this disease. We have talked to scientists at NIH who believe that an intensified effort on diabetes could lead to some important breakthroughs in our understanding of how we can cure diabetes.

There are between 700,000 and one million Americans who suffer from Type 1 diabetes, as many as half of whom are children. These Americans -- even those who receive the proper treatment -- are likely to develop at least one of severe diseases associated with diabetes, such as blindness, heart disease, or kidney problems later in life. We will not be able to eliminate the serious consequences and costs of this disease until we develop a cure.

Q: WHY IS ARE YOU SUPPORTING AN APPROACH THAT IS OUTSIDE THE NORMAL APPROPRIATIONS PROCESS THAT SUPPORTS THE NATIONAL INSTITUTES OF HEALTH (NIH)?

A: The $150 million allocated by the HHS Secretary for Type I diabetes will be given out by the Secretary -- with the help of the top scientists at HHS -- to the most promising research scientific research projects. NIH is currently in the process of administering a clinical trial for Type I diabetes and is making significant progress in research on Type I diabetes. Scientists at NIH believe that this new intensified effort will provide more resources in a tight budget to take the next steps in understanding this disease.

Q: DO YOU PLAN TO ALLOW THE HHS SECRETARY TO ALLOCATE GRANTS FOR OTHER DISEASES AS WELL?

A: This is an intensified effort to help research a cure for one of our nation's most costly diseases and to help reduce the impact of diabetes on Native Americans since it is devastating this population. There are not currently any plans to extend this kind of allocation to other diseases.

Q: WHY ARE WE FOCUSING SO MUCH OF THIS EFFORT ON DIABETES CARE FOR NATIVE AMERICANS?

A: The death rate for Native Americans with diabetes is nearly three times that of other Americans. In some tribes more than one-third of the population suffers from this dreadful disease. Native Americans are also far less likely to receive adequate treatment to manage this disease and therefore are more likely to get some of the serious complications associated with diabetes, such as kidney disease and heart disease more frequently.

This disease is devastating this population, and it is important that we make a concentrated effort to eliminate some of its damaging effects. We believe that this significant investment in preventing, treating, and researching diabetes in Native Americans will take a significant step towards improving this serious problem.

Q: WHY IS THE NEW MEDICARE BENEFIT FOR PEOPLE WITH DIABETES SO IMPORTANT? DON'T MOST BENEFICIARIES GET THEIR DIABETES CARE PAID FOR BY SUPPLEMENTAL INSURANCE?

A: Many older Americans with diabetes -- even many of those with supplemental insurance -- are not getting the proper care they need to prevent the costly devastating complications associated with diabetes. Medicare beneficiaries report that they are unsure how to properly manage their diabetes care.

Moreover, Medicare does not currently cover some of the most critical services that beneficiaries with diabetes need to manage their disease. It does not pay for blood glucose monitors or for the strip tests that people with diabetes need to monitor their blood sugar.

The balanced budget expands Medicare's coverage of benefits for people with diabetes by $2.1 billion over five years. In so doing, it expands the number of people able to take advantage of self-management tools will increase the number of Americans who properly manage their diabetes, thereby helping to prevent the debilitating and costly complications too often associated with the disease.

Q: WILL WE BE ABLE TO CURE DIABETES WITH THIS INVESTMENT?

A: No investment in research can guarantee that a cure can be discovered. However, scientific researchers are making significant progress in the area of diabetes and scientists at NIH say that this new investment will help these important efforts.

Quotes

QUOTES SUPPORTING PRESIDENT CLINTON'S ANNOUNCEMENT ON UNPRECEDENTED DIABETES INITIATIVE

"President Clinton's announcement today ends an extraordinary week in the history of diabetes in America. Because of the President's support of bi-partisan initiatives, nearly $3 billion of new money will be invested into research and treatment. Finally, diabetes is getting the recognition it deserves as a major public health problem facing America."

"By investing now in the tools and services that can help seniors manage their diabetes, we anticipate that Medicare can help reduce the enormous human and financial cost that accompanies diabetes complications. This is a dramatic step forward since Medicare traditionally has paid for diabetes-related hospitalizations, but nor for the means that would help keep seniors out of the hospital."

American Diabetes Association

"With the tremendous human and economic tolls taken by this devastating disease and its complications, it is more than appropriate that a full frontal attack on diabetes be launched by the federal government. This long awaited increase contains a signficant infusion of new funds for research into Type I diabetes, and provides renewed hope for millions of Americans."

"We know that this extraordinary initiative [announced by the President today] will help attract the attention of our leading scientists, and encourage them to apply their knowledge to the complex and myriad problems of diabetes in new and imaginative ways."

-- Juvenile Diabetes Foundation International

"Insulin is not a cure. With this initiative, we can capitalize on years of research progress and start to move advances out of the laboratories to the bedsides of our loved ones."

-- Mary Tyler Moore
International Chairman
Juvenile Diabetes Foundation International

"President Clinton is to be commended for providing leadership in improving the quality of life for the 16 million Americans who suffer from Diabetes. This significant development is a positive step forward in expanding the life expectancy for the millions of African Americans who have been victims of this dreaded disease."

-- The National Caucus and Center on
Black Aged, Inc.

"For the approximately 3 million African Americans affected by diabetes and who suffer a disproportionate burden from its complications, the initiatives announced by President Clinton will prompt a shift in the quality of care and access to services that can improve outcomes. The National Medical Association feels strongly that this is a health initiative that will strike a major blow to the debilitating effects of a silent killer in high-risk minority communities, and reduce the enormous drain on human and fiscal resources caused by diabetes."

"The National Medical Association enthusiastically applauds President Clinton for the provisions in the balanced budget package directed towards cure of Type I diabetes, more intense preventive services and treatments for Native Americans, and improved coverage for self-management of older and other high-risk populations. For the almost 3 million African Americans with diabetes, who suffer higher rates of amputations and kidney failure, these initiatives signal a major shift in the direction of bringing much of our new knowledge to bear on relief of a costly and debilitating disease, while hastening our quest to eradicate it completely."

-- National Medical Association

"President Clinton is the first President to understand the importance of diabetes to so many people. We know that the President's diabetes initiative will improve the quality of life for the 1.3 million Hispanic diagnosed with this chronic disease. As Hispanics are twice as likely as the general population to have diabetes we know that our communities welcome this major step from the President."

-- Jane L. Delgado, Ph.D.
President and CEO
National Coalition of Hispanic Health and
Human Services Organizations (COSSMHO)

Native Amer

Native Amer.

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FAX NUMBER:

TOTAL NUMBER OF PAGES: 3
(including this cover page)

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FROM: GW

COMMENTS:

Per the invitation for Chief Dugan to be one the speakers at the President's announcement of the diabetes initiative, enclosed is a background bio on Chief Dugan that you requested. Also enclosed is the tribal delegation she is bringing with her with their DOBs and SS #s for clearance purposes. We will have a draft of her speech to you shortly. Please call if there are any questions.

The Eastern Band of Cherokee Indians

The Honorable Joyce C. Dugan, Principal Chief
The Honorable Gerard Parker, Vice-Chief

Joyce Elaine Conseen Dugan
Principal Chief
Eastern Band of Cherokee Indians

Joyce Dugan is the Principal Chief of the Eastern Band of Cherokee Indians located in Western North Carolina. The tribe has approximately 11,500 tribal members, and a land base which consists of 56,000 acres much of which is adjacent to the Great Smoky Mountains National Park.

She has held the office of Principal Chief for two years and was the first woman to be elected to the tribe's highest office. Principal Chief Dugan has a background in education having obtained a masters degree in Education from Western Carolina University, and she is the former superintendent of the Cherokee Central Schools System.

A few of the major initiatives of her administration have been cultural preservation, education, and the promotion of health initiatives which focus on prevention and treatment of diabetes a disease that affects almost every family in our Tribe either directly or indirectly. Another initiative is to lead the Eastern Band of Cherokee Indians toward self sufficiency and away from dependence upon the Federal Government.

Cultural integrity in the face of ever-increasing change is extremely high on Chief Dugan's list of priorities. She recognizes that it is critical that the Tribe balance economic development with the preservation of cultural and natural resources if the tribe is to survive as a People. A local community college, a daycare language emersion project, and a family cultural/language center are being explored for the future.

Qualla Boundary • P.O. Box 455 • Cherokee, N.C. 28719
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Tribal Delegation Accompanying Principal Chief Joyce Dugan At Speech Announcing Diabetes Initiative

Joyce Elaine Conseen Dugan
Principal Chief
DOB P6/b(6)
SSN [redacted]

Kathryn Lee Smith Littlejohn
Executive Director of Health & Human Services
DOB P6/b(6)
SSN [redacted]

Birdie Lynne Harlan
Executive Director of Cultural Development
DOB P6/b(6)
SSN [redacted]

Bradley Brady Letts
Attorney General
DOB P6/b(6)
SSN [redacted]

George David Waters
Lobbyist
DOB P6/b(6)
SSN [redacted]

Diabetes in North American Indians and Alaska Natives

Diabetes in the Native American population has limited data because only those served by the Indian Health Service (IHS), an agency of the U.S. Health Service, were surveyed. Indians living on reservations are not included in US national survey's. However, in the United States, 1.9 million individuals identified themselves in the 1990 Census as American Indian or Alaska Native, but only 1.2 million of these resided in the 33 reservation states served by the IHS. The following data is based on the 1.2 million in the 33 reservation states.

The 1987 survey by IHS showed that 12.2% of Indian children (19 years of age and younger) are diabetic compared to 5.2% in the general population.

MORTALITY RATE

In 1989, Type 2 (Adult) **diabetic mortality rates in the American Indian and Alaska Native population is 2.7 times the rate of the US general population. From 1984-86 1,252 Native American deaths were diabetic related, 708 deaths listed diabetes as the underlying cause.** Allowing for the under reported death certificates of Indians in northern America by 65% the National American Feedback study found that the **diabetic mortality rate of Native American is 4.3 times the rates of whites.** In New Mexico the rate is 3.6 times that of whites. On **Canadian Indian Reservations** the mortality rate is **2.2 times higher** than in **Canadian men** and **4.1 times higher** than in **Canadian women.** Studies done in **Pima Indians** from 1975-84 found that their **mortality rate is 11.9 times** greater than the 1980 death rate for **all races** in the United States.

- **Longer duration of Diabetes and Proteinuria were both associated with increased mortality**

Medical Expenditure Survey of American Indians (IHS)

- Indian Women w/Diabetes 13.2%
- Indian Men w/Diabetes 11.0%

Genetics

- A genetic marker linked with insulin resistance, has been described in Pimas.
- Diabetes is higher in Full-blooded Native Americans.
- In Pimas, Diabetes I higher in the offspring of parents who developed Diabetes at a young age.
- The Pima tribe of Arizona has the highest rate of diabetes in the world. Approximately 50% of Pimas between the ages of 30-64 have diabetes.

Complications

Kidney Failure- Native Americans are 2.5 - 4 times at greater risk to enter kidney failure treatment

- One-fourth of all End-Stage Renal-Disease cases were contributed to Diabetes
- 1983-86 ESRD ESRD incidence for Native Amer. was 2.8 times the rate of whites with 55% contributed to Diabetes

US Incidence of Diabetic ESRD

-Out of 1 million new cases between 1987-90

39. is white

149 is black

236 is Native American

Native Americans have a six times higher rte of developing ESRD (kidney failure) than the general population

Cataracts

Cataract surgery is higher in Pimas compared to the general population

Amputation

-Leg amputations are had by people w/ diabetes 15 to 40 times more often than people without diabetes. Each year 54,000 people lose their foot or leg to Diabetes. Native Americans are 3 to 4 times greater to have an amputation than the general population.

CONCLUSION

Diabetes in the Native American population is growing at alarming rates. Statistics have shown that the Native American has a higher incidence of ESRD and Mortality rate than the general population. Furthermore, IHS officials claim that the diabetes program was funded at only 75% of need. These facts are enough to support the Presidents recommendation to increase IHS diabetes funding to $2.5 million.

General Diabetic Statistics

PREVALENCE

Number of people diagnosed w/diabetes (1993)
- Women: 4.2 Million
- Men: 3.6 Million
- Children 19 and younger: About 100,000
- Adults 65 and older: 3.2 million

Percent of adults with diabetes by race and ethnicity
(Diagnosed and undiagnosed)
- African American: 9.6 percent
- Mexican American: 9.6 percent
- Cuban American: 9.1 percent
- Puerto Rican American: 10.9 percent
- White Americans 6.2 percent
- American Indians: Ranges from 5 to 50 percent
- Japanese Americans: Japanese Americans 45-75 years of age in King County, WA, 20 percent of the men and 16 percent of the women had diabetes.

African Americans and Diabetes

Diabetes Mellitus is one of the most challenging health conditions facing 30 million African Americans. It is the 5th leading cause of death in African Americans between the ages of 45-64 and is the third leading cause of death in African American women of all ages in 1990. In 1993 1.3 million African Americans were known to have diabetes 3 times the number diagnosed in 1963.

STATISTICS (1993)

- for every white person who gets Diabetes 1.6 African Americans get Diabetes
- One in 4 black Women 55years and older has diabetes.
- 25% of blacks between 74-65 has diabetes.
- Afr.Amer. Are more likely to develop complications and disability from Diabetes.
- At age 45 or older the prevalence of Diabetes is 1.4 to 2.3 times as frequent as in whites.
- In the 65-74 age range 17.4 percent of black Americans had diagnosed diabetes compared to 9.5% of white Americans
- African American children have lower rates of Type 1
- African Americans 40 years of age and older have Type 2 or non-insulin-dependent Diabetes.

Diabetes and Pregnant African American Women

- Afri. Amer women have a 80percent higher gestational diabetes rate than white women
- These women are 2 times more likely to develop diabetes in future pregnancies and type 2 diabetes in 20 years.

Complications

- Afri. Amer develop a higher rate of blindness, kidney failure, and amputations from diabetes in comparison to white Americans

Kidney failure

- 2.5 -5.5 times more often than whites

Visual Impairment

- 40 percent higher in African Americans than whites

Amputations (1991 study)

- 19 percent higher than whites

CONCLUSION:

Approximately 1.3 million African Americans have been diagnosed with Diabetes in the United States. They are more likely to suffer from diabetic related kidney failure, visual impariment, and amputations than there white counterparts. Pregnant African American women have a 80% higher gestational diabetes rate than white women. For these reasons we must increase diabetes funding.

Diabetes and the Elderly

The most common form of diabetes among older people is type II, or non-insulin-dependent diabetes. It accounts for 85% of all cases. More than 40% of individuals 65-74 yr of age and 50% of individuals 80-89 yr of age have diabetes. It is the fifth cause of death in people between the ages of 65-74. Aging does not cause diabetes however diabetes mellitus is now largely a geriatric disease.

DIAGNOSIS

- Inaccurate diagnosing of the elderly as diabetic, (NIH Study) based on a natural increase in glucose level with aging.

TREATMENT

- Basic treatment of diabetes is dietary prescription and exercise, however the elderly mos often must be encouraged to do exercise that will not over tax their circulatory system.
- Drug treatment is also risky since it must not cause complications with other drugs
  Examples:
  The oral hypoglycemic agents used for Type II diabetes may cause congestive heart failure in patients with heart disease
  Poor eyesight and manual dexterity problems will complicate insulin injections

AMPUTATION

- **65 yr and older 100 per 100,000**
- **45-64 yr of age 45 per 100,000**
- **below 44 yr of age 12 per 100,000**

CONCLUSION:

Elderly diabetics can expect to have more medications, side effects to medications and difficulty in following and exercise and dietary regimens, but good surveillance, proper diagnosis can prevent intensive diabetic treatment.

Children w/Diabetes

A child w/ Juvenile Diabetes is faced with death-threatening monitoring responsibilities on a daily basis. They must administer **insulin injections 6 times a day, conduct blood glucose testing 8 times a day,** and stick to a stringent diabetic diet plan. Each stage of childhood brings on different parental concerns for a parent of a child w/diabetes.

(New Statistic About 100,000 under 19 yrs. Of age and 800,000 under 30)

INFANCY CONSIDERATIONS:

-Finger Sticks and Injections that can cause pain (AM I Hurting my Baby)
-How it will effect their eating and sleeping routine
-Entrusting the care of your diabetic infant to other caretakers
-Marital tension caused by the parents that are communicated to the child interfering with the childs developing a sense of trust.

TODDLERHOOD

-Fussy eating habits and temper tantrums are normal toddler reactions, but these actions can interfere with the diet of a diabetic toddler.
Parents should consult a child behavioral psychiatrist on ways to curb this normal behavior of independence exhibited by toddlers for the sake of their diet.

PRESCHOOL Years

-Finger Pricking and Injections for Children between the ages of three and five may cause them to develop a fear of their disease. Injection and blood testing time can become nightmarish battles for parents and child. Experts suggest giving your child a reward every time they remain still for the allotted amount of time during an injection.

SCHOOL Years

-Verbal and Non-verbal peer pressure may cause a child to falter from their diabetic schedule. Eating a candy bar to "fit in" with the crowd or not eating a snack in front of their peers out of embarrassment are examples of non-verbal peer pressure. A diabetic child is reminded daily that they are not like everyone else.
-Parents may become apprehensive about how well their child will stick to their diet when in school
-Entrusting that others will monitor your childs blood sugar intake or handle an episode of low blood glucose affectively may affect a children school attendance and socializing skills.
-Children may experiment with there diabetic rules by skipping insulin shots and not monitoring their blood glucose levels, thus putting their lives in jeopardy. Parents must address cheating behavior as it occurs.

CHILD DIABETES STATS

-OVER A LIFETIME TYPE I DIABETICS SPEND AN AVERAGE OF 60,000 HOURS DOING SELF TREATMENT

-(New Statistic About 100,000 under 19 yrs. Of age and 800,000 under 30)

-A child w/Diabetes life expectancy is 30% less than his peers.

-

American Diabetes Association.

Legislative Fact Sheet

FY 1998 Funding for the CDC Division of Diabetes Translation

Background

The Centers for Disease Control and Prevention (CDC) is the nation's primary public health agency. The CDC's main responsibility is to diminish the impact of disease in America, including diabetes. Activities related to diabetes are conducted through the CDC's Division of Diabetes Translation

The Division of Diabetes Translation is funded through an annual appropriation from Congress. State health departments then apply for money to conduct community based diabetes prevention and control programs. These programs help diagnose people with diabetes and provide information that enables people to avoid the costly and unnecessary complications of the disease.

President Clinton, in his FY98 budget request, has called for a 38% or $10 million increase for the CDC diabetes program. This increase will fund diabetes control programs in all states, fund a National Diabetes Education Program and conduct research focusing on applying findings from recent diabetes studies.

Recommendation

The American Diabetes Association strongly supports President Clinton's $10 million increase for CDC's Division of Diabetes Translation.

American Diabetes Association.

Legislative Fact Sheet

FY 1998 Funding for the Indian Health Services Diabetes Program

Background

The U.S. government has the responsibility for providing health care for the approximately 1.4 million Native Americans who are members of federally recognized tribes. This legal agreement was defined in federal treaty obligations stipulating that health care is to be provided to Native Americans, at no direct cost, in exchange for tribal land ceded to the government. Since 1955, The Indian Health Service (IHS) has been the federal agency responsible for carrying out this agreement.

Currently, diabetes is growing at epidemic proportions in the Native American Community. With one in three Native American adults being diagnosed with diabetes it is critical that the IHS diabetes program have adequate resources to provide for the Native American Community. Recent comments by IHS officials indicate that the diabetes program was funded at only 75% of need.

Recommendation

The American Diabetes Association supports an increase of $2.5 million for IHS diabetes funding.

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MESSAGE FOLLOWS

The mission of the American Diabetes Association is to prevent and cure diabetes and to improve the lives of all people affected by diabetes.

Chapter 34

Diabetes in North American Indians and Alaska Natives

Dorothy Gohdes, MD

SUMMARY

The epidemic of non-insulin-dependent diabetes mellitus (NIDDM) in Native American communities has occurred primarily during the second half of this century. Although NIDDM has a genetic component, with rates highest in full-blooded Native Americans, the incidence and prevalence of the disease have increased dramatically as traditional lifestyles have been abandoned in favor of westernization, with accompanying increases in body weight and diminished physical activity. Anthropologic studies have shown that several tribes perceive diabetes as an assault from outside the community. Diabetes was once described as benign in American Indians; now, diabetes and its complications are major contributors to morbidity and mortality in all Native American populations, except the isolated Arctic groups whose lifestyles remain relatively unchanged. Insulin-dependent diabetes mellitus (IDDM) is rare in Native Americans and most cases of IDDM are found in individuals with significant non-Native American ancestry.

Much of our understanding of the natural history of NIDDM in North American Indians is derived from the longitudinal epidemiologic studies of the Pima Indians in southern Arizona. The relationship of obesity to subsequent diabetes as described in studies of the Pimas is present in all Native American populations. Native American communities experience high rates of microvascular complications from diabetes, although the rates of cardiovascular disease differ from tribe to tribe. The differences may reflect genetically based variations in lipid metabolism or other coronary risk factors or, alternatively, differences in lifestyle. The extent of diabetes in Native American communities today demands public health programs that incorporate specific psychosocial and cultural adaptations for individual tribes.

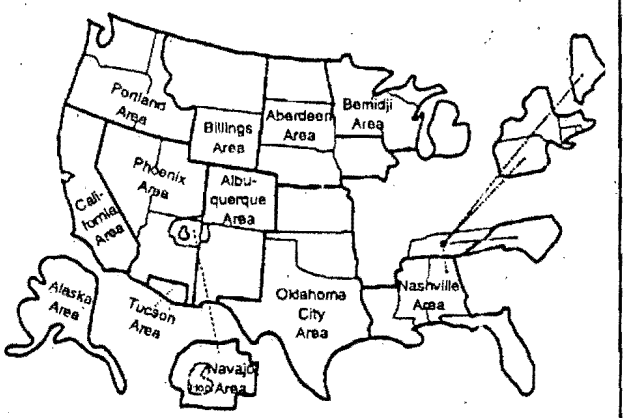
INTRODUCTION

Native Americans are a diverse group of people whose ancestors lived in North America before the European settlement. In the United States alone, there are more than 500 tribal organizations. In addition to their tribal affiliations, Native Americans are often distinguished by language and/or cultural groups, some of which extend across both the United States and Canada. Contemporary Native American populations live in urban areas and on reservations or reserves in both countries. In the United States, ~1.9 million individuals identified themselves in the 1990 Census as American Indian or Alaska Native, but only 1.2 million of these resided in the 33 reservation states served by the Indian Health Service (IHS), an agency of the U.S. Public Health Service[1,2]. Few data exist on the health of urban Native Americans in either the United States or Canada. Overall, the Native American populations of North America are young, with a median age in 1990 of 26 years, compared with 33 years for all races in the United States. In addition, Native Americans are disadvantaged both economically and educationally compared with the general U.S. population.

PREVALENCE

Because American Indians living on reservations are not included in U.S. national health surveys, data on the prevalence of diabetes in Native Americans residing in the United States are limited. Rates have been estimated from case registries maintained at health facilities, glucose testing at a community level, and surveys of self-reported diabetes. In the United States and Canada, prevalence estimates for diagnosed diabetes are available from health care facilities where care is provided at no charge to Native Americans. The IHS estimated the rates of diagnosed diabetes from

Figure 34.1
Indian Health Service Areas



Source: Indian Health Service

ambulatory care visits that covered 86% of the estimated 1 million American Indians served through the IHS in 1987[3]. Duplicate records were excluded by using unique patient identifiers. Rates were calculated for the regions shown in Figure 34.1. A similar estimate covering 76% of the Inuit and Canadian Natives living on reserves was also undertaken in 1987, using ...ses known to the Medical Services Branch of the Department of National Health and Welfare in Canada[4]. Crude and age-adjusted rates of diabetes from these two surveys are shown in Table 34.1[3,4]. The rates decreased toward the north and west in Canada. Although a similar trend was not apparent in the United States, rates in the far northwest were relatively low in both countries. Rates of diabetes were higher in women than in men in all Canadian provinces, a trend also found for the United States in current diabetes estimates by the IHS. Women had higher rates of diabetes (13.2%) than men (11.0%) in a special medical expenditure survey of American Indians eligible for IHS services conducted in 1987[5]. In the survey, the age- and sex-adjusted diabetes rate in individuals age ≥19 years was 12.2%, compared with 5.2% in the general U.S. population. A summary of published studies[6-24] of diabetes prevalence in individual tribes in North America is presented in Table 34.2. These studies used criteria of the World Health Organization (WHO) and the U.S. National Diabetes Data Group (NDDG) for diagnosis of NIDDM[25,26].

Striking increases in the prevalence of diabetes in recent years have been described in Pima Indians and other tribes[11,22,27-29]. Because the incidence of diabetes has also increased in Pimas, and presumably in other tribes, the increased prevalence in many tribes is probably due to an increased incidence and cannot be attributed solely to longer survival of diabetic individuals[27]. Figure 34.2 shows the prevalence of diabetes in Pima Indians in each of three time periods since 1965[27]. Appendix 34.1 compares prevalence of diabetes in Pima Indian men and women with prevalence of NIDDM in a sample of U.S. white men and women.

Table 34.1
Diagnosed Diabetes in Native American Communities in the U.S. and Canada, All Ages, 1987

	Crude prevalence per 1,000	Age-adjusted prevalence per 1,000
United States		
Tucson	76	119
Aberdeen	60	105
Phoenix	65	104
Albuquerque	55	94
Bemidji	53	92
Nashville	63	87
Billings	50	86
Oklahoma	49	60
Navajo	32	56
Portland	29	49
Alaska	9	15
All IHS	45	69
Canada		
Atlantic	43	87
Quebec	29	48
Ontario	46	76
Manitoba	28	57
Saskatchewan	17	39
Alberta	22	51
Yukon	7	12
NW Terr. Indian	5	8
NW Terr. Inuit	3	4
British Columbia	9	16

U.S. rates are age-adjusted to the 1980 U.S. population; Canada's rates are age-adjusted to the 1985 Canadian population.

Source: References 3 and 4

DETERMINANTS OF DIABETES

The longitudinal studies of diabetes conducted in Pima Indians since 1965 have provided extensive information about NIDDM and its natural history in American Indians. The form of diabetes that affects Pimas is characterized biochemically and immunologically as NIDDM, an observation that confirms the paucity of IDDM also noted in other tribes[27,30].

Table 34.2

Prevalence of Diabetes in North America Native Populations by Region

Reservation/Location	Tribe	Age	Date	Rate/1,000	Adjustment	Method	Reference
Southwest							
Tohono O'odham, AZ	Tohono O'odham	≥18	1985-86	183	None	Case registry w/record review	6
Gila River, AZ	Pima	30-64	1982-87	500	Age World pop.	Biennial community screening	7
New Mexico	Pueblo (Rio Grande)	≥35	1985	213	None	Case registry w/record review	8
Zuni, NM	Zuni	≥35	1985	282	None	Case registry w/record review	8
Jicarilla Apache, NM	Apache	≥35	1985	98	None	Case registry w/record review	8
Mescalero Apache, NM	Apache	≥35	1985	164	None	Case registry w/record review	8
Navajo, NM	Navajo	≥35	1985	165	None	Case registry w/record review	8
Arizona and New Mexico reservations	Apache	≥15	1987	101	Age U.S. 1980	Outpatient records not verified	9
Navajo, AZ and NM	Navajo	≥15	1987	72	Age U.S. 1980	Outpatient records not verified	9
Navajo, AZ	Navajo	20-74	1989	165	Age/sex U.S. 1980	Case registry community screening	10
Navajo, AZ	Navajo	≥20	1988	124	Age U.S. 1980	Community sample w/screening	11
Rocky Mountain West							
Fort Hall, ID	Shoshone/Bannock	All	1987	95	Age/sex U.S. 1980	Case registry w/chart review	12
Nez Perce, ID	Nez Perce	All	1987	105	Age/sex U.S. 1980	Case registry w/chart review	12
Blackfeet, MT	Blackfeet	≥15	1986	168	Age ≥15 U.S. 1980	Case registry w/chart review	13
Crow, MT	Crow	≥15	1986	85	Age ≥15 U.S. 1980	Case registry w/chart review	13
Fort Belknap, MT	Assiniboine/ Gros Ventre	≥15	1986	118	Age ≥15 U.S. 1980	Case registry w/chart review	13
Fort Peck, MT	Assiniboine/Sioux	≥15	1986	173	Age ≥15 U.S. 1980	Case registry w/chart review	13
Northern Cheyenne, MT	Northern Cheyenne	≥15	1986	59	Age ≥15 U.S. 1980	Case registry w/chart review	13
Wind River, WY	Shoshone/Arapaho	≥15	1986	125	Age ≥15 U.S. 1980	Case registry w/chart review	13
Utah and Colorado	Ute	≥15	1987	124	Age U.S. 1980	Outpatient records not verified	9
Northern Plains							
Cheyenne River, SD	Sioux	All	1987	106	Age U.S. 1980	Outpatient records not verified	14
Crow Creek, Lower Brule, SD	Sioux	All	1987	83	Age U.S. 1980	Outpatient records not verified	14
Devil's Lake, ND	Sioux	All	1987	111	Age U.S. 1980	Outpatient records not verified	14
Pine Ridge, SD	Sioux	All	1987	70	Age U.S. 1980	Outpatient records not verified	14
Rosebud, SD	Sioux	All	1987	82	Age U.S. 1980	Outpatient records not verified	14
Sisseton/Wahpeton, SD	Sioux	All	1987	64	Age U.S. 1980	Outpatient records not verified	14
Turtle Mountain, ND	Chippewa	All	1987	105	Age U.S. 1980	Outpatient records not verified	14
Standing Rock, ND/SD	Sioux	All	1987	125	Age U.S. 1980	Outpatient records not verified	14

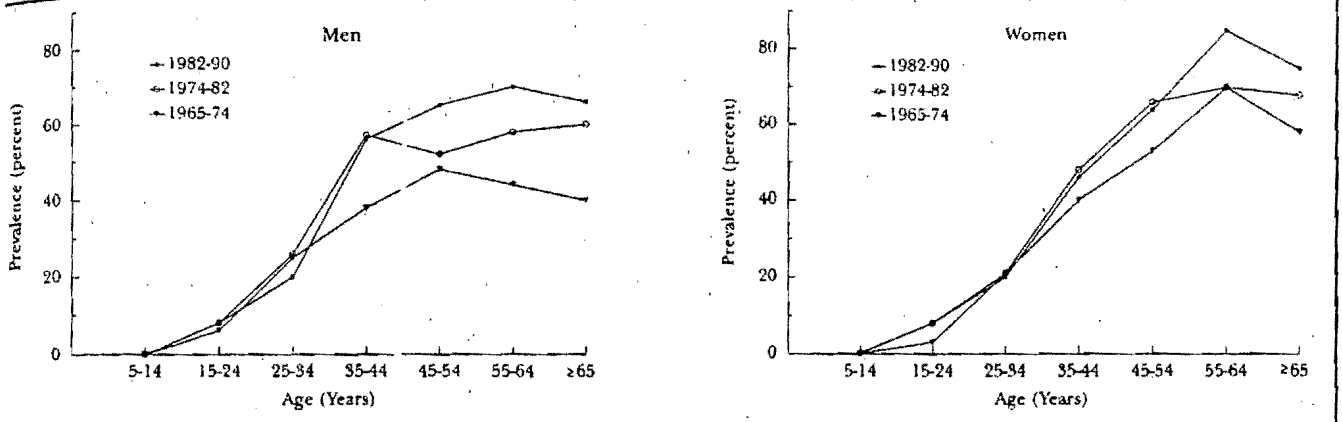
Table 34.2—Continued next page

Table 34.2—Continued

Reservation/Location	Tribe	Age	Date	Rate/1,000	Adjustment	Method	Reference
Yankton/Santee, SD	Sioux	All	1987	196	Age U.S. 1980	Outpatient records not verified	14
Winnebago/Omaha, NE	Winnebago/Omaha	All	1987	218	Age U.S. 1980	Outpatient records not verified	14
North and South Dakota reservations	Sioux	≥15	1987	117	Age U.S. 1980	Outpatient records not verified	9
Upper Midwest							
Red Lake, MN	Chippewa	All	1987	148	Age/sex U.S. 1980	Case registry verified/screening	15
MN and ND—Chippewa reservations combined	Chippewa	≥15	1987	144	Age U.S. 1980	Outpatient visits not verified	9
Ontario and Manitoba, Canada	Cree/Ojibwa	All	1983	28	None	Case registry w/chart review	16
SW Ontario, Canada	Oneida/Chippewa	≥5	1985	147	Age Canada 1985	Case registry w/chart review	17
Northeast							
St. Regis, NY	Mohawk	All	1989	49	Age U.S. 1980	Case registry w/chart review	18
River Desert/Lac Simon, Quebec, Canada	Algonquin	≥15	1989	150	None	Community survey	19
Nova Scotia, Canada	Micmac	All	1989	53	None	Case registry	20
South							
Choctaw, MS	Choctaw	All	1989	163	Age U.S. 1980	Case registry w/chart review	21
Cherokee, NC	Cherokee	All	1988	106	Age U.S. 1980	Case registry	22
Pacific Northwest							
Lummi, WA	Lummi	All	1987	40	Age/sex U.S. 1980	Case registry w/chart review	12
Tahola, WA	Quinalt	All	1987	50	Age/sex U.S. 1980	Case registry w/chart review	12
Makah, WA	Makah	All	1987	53	Age/sex U.S. 1980	Case registry w/chart review	12
Colville, WA	Colville	All	1987	52	Age/sex U.S. 1980	Case registry w/chart review	12
Spokane, WA	Spokane	All	1987	56	Age/sex U.S. 1980	Case registry w/chart review	12
Yakima, WA	Yakima	All	1987	75	Age/sex U.S. 1980	Case registry w/chart review	12
Umatilla, OR	Umatilla	All	1987	65	Age/sex U.S. 1980	Case registry w/chart review	12
Warm Springs, OR	Warm Springs	All	1987	75	Age/sex U.S. 1980	Case registry w/chart review	12
Far North							
Alaska	All native	All	1987	17	Age U.S. 1980	Case registry w/chart review	23
Alaska	Eskimo	All	1987	10	Age U.S. 1980	Registry verified w/chart audit	23
Alaska	Indian	All	1987	24	Age U.S. 1980	Case registry w/chart review	23
Alaska	Aleut	All	1987	29	Age U.S. 1980	Case registry w/chart review	23
Yukon Indian	Indian	All	1987	9	Age World pop.	Case registry not verified	24
NW Territories Indian	Indian	All	1987	7	Age World pop.	Case registry not verified	24
NW Territories Inuit	Inuit	All	1987	4	Age World pop.	Case registry not verified	24

Source: References are listed within the table

Figure 34.2
Prevalence of Diabetes in Pima Indians, by Age, Sex, and Time Period

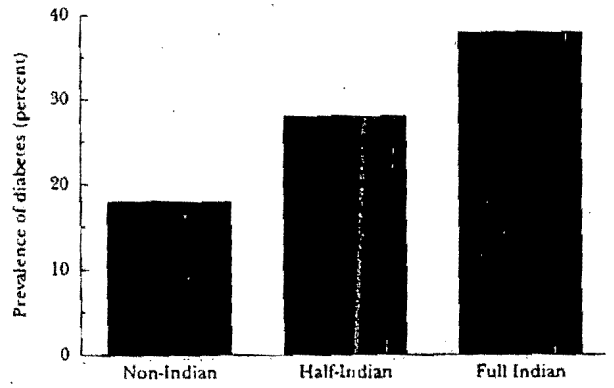


Source: Reference 27

GENETICS

Diabetes rates are highest in full-blooded Native Americans, as first observed in Choctaw Indians in 1965 and subsequently in other tribes[31-33]. The prevalence of diabetes in residents of the Pima community is highest in individuals of full Native American heritage (Figure 34.3)[33]. In Pimas, diabetes rates are highest in the offspring of parents who themselves developed diabetes at a young age (Figure 34.4)[34]. Diabetes is also familial in Oklahoma Indians, an observation suggesting that genetics and/or family lifestyles predispose individuals to NIDDM[35]. Although the precise genetic components of NIDDM have not been completely described in American Indians, a genetic marker linked with insulin resistance, a major factor in the pathogenesis of NIDDM, has been described in Pimas[36].

Figure 34.3
Prevalence of NIDDM in Pima Indians, by Indian Heritage



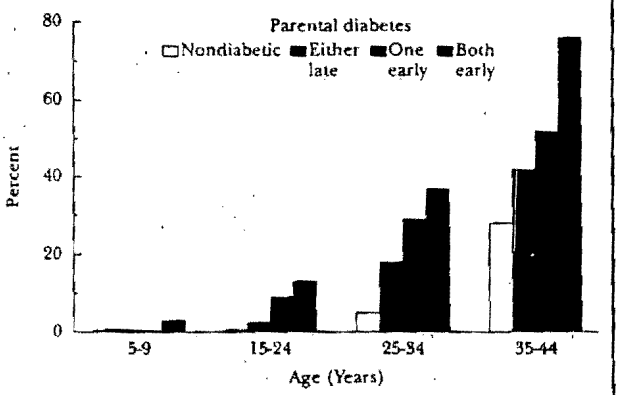
Data are age- and sex-adjusted.

Source: Reference 33

OBESITY

Obesity is a major risk factor for diabetes in Pimas and is widespread in many tribes, with increasing rates of obesity measured in several communities in the United States and Canada[11,37-41]. The interaction of obesity with genetic susceptibility to diabetes as measured by parental diabetes is shown in Figure 34.5 for Pimas[42]. A striking increase in obesity has occurred in Pimas in recent years (Figure 34.6)[27,43]. In addition,

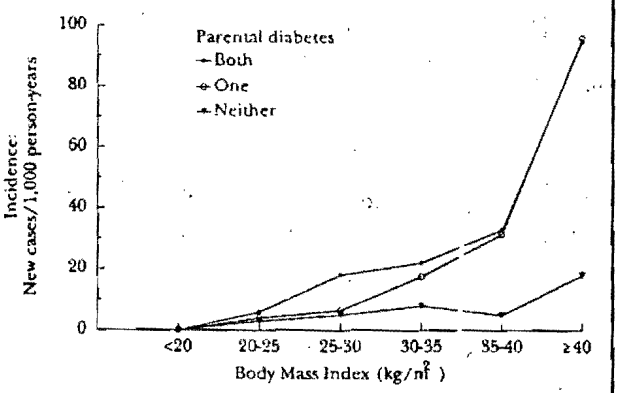
Figure 34.4
Prevalence of Diabetes in Pima Indians, by Presence and Age at Onset of Diabetes in the Parents



Persons for whom both parents had been examined were grouped into four groups according to parental diabetes: both early, one early, either late, or nondiabetic according to whether the parents had diabetes and whether the parental diabetes was diagnosed before or after age 45 years.

Source: Reference 34

Figure 34.5
Incidence of NIDDM in Offspring of Pima Indians by Body Mass Index and Parental Diabetes



Source: Reference 42

longer duration of obesity has been shown to increase the risk of diabetes[44].

Central obesity was characteristic of Canadian Indians studied in Manitoba and Ontario[40]. In young Pimas, waist-to-hip ratio, a measure of central obesity, was more strongly associated with diabetes than body mass index, a measure of overall obesity[38]. In Navajo women, a small study found an increased waist-to-hip ratio associated with a statistically significant increased risk of diabetes, but a similar association was not significant in Navajo men[45]. Appendix 34.2 shows data on obesity and other metabolic variables in Native American groups included in the Strong Heart Study.

LIFESTYLE

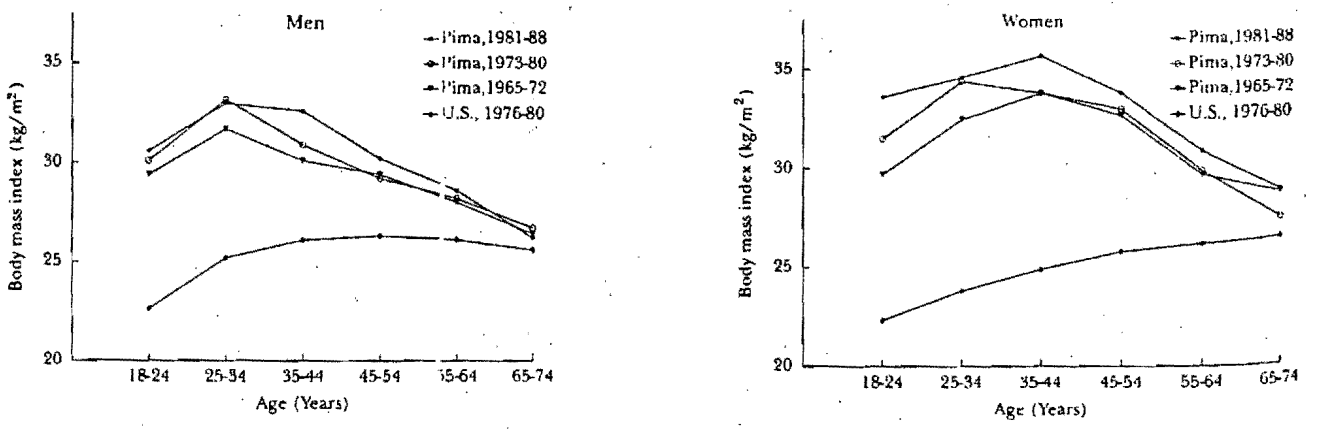
Both diet patterns and physical activity have changed markedly in Native American communities over recent decades. Although detailed longitudinal surveys are not available for most tribes, the disruption of traditional agriculture and hunting has resulted in increased consumption of fat—typical of the contemporary western diet. In Pimas, a high-calorie diet has been associated with the development of diabetes[27]. Carbohydrate intake was the single strongest predictor of NIDDM but was closely related to total calorie and fat consumption.

Physical activity has decreased as individuals have acquired motorized transportation and sedentary occupations. Diabetic Pimas reported less lifetime and current physical activity than nondiabetic individuals[46]. A recent case-control study in Zuni Indians showed the risk of presenting with diabetes decreased significantly with increasing physical activity, even after adjusting for obesity, suggesting that physical activity itself decreased the risk of NIDDM independently of body weight[47].

PATHOGENESIS

Studies of the pathogenesis of NIDDM in Pimas indicate that insulin resistance, as measured by nonoxidative glucose disposal, is an early metabolic defect[48]. Longitudinal studies have found that insulin secretion and insulin resistance increase as individuals develop impaired glucose tolerance[49]. Insulin levels then fall as frank NIDDM develops, often at a relatively young age[50,51].

Figure 34.6
Mean Body Mass Index in Pima Indians and the U.S. White Population



Data for U.S. whites are from the Second National Health and Nutrition Examination Survey.

Source: References 27 and 43

ergy metabolism and obesity have been studied in attempt to characterize a "thrifty gene"[52]. Although the exact causes of obesity have not been explained, studies in Pimas have found energy expenditure to be familial and a low metabolic rate to be predictive of subsequent weight gain. Detailed metabolic studies have not been conducted in other tribes, but a propensity to obesity and NIDDM is widespread, as has been the change from traditional high-carbohydrate diets to modern high-fat diets. Contemporary high-fat diets are associated with deterioration of carbohydrate metabolism in both Pimas and Caucasians[53]. Although our understanding of the current "epidemic" of NIDDM in Native Americans is based on studies of Pimas, the interaction between environmental changes and genetic susceptibility to NIDDM is not limited to Pimas but appears to be widespread in all indigenous North Americans, as well as other populations throughout the world.

MORTALITY

The mortality from diabetes in Native Americans is striking, yet it is seriously underestimated in U.S. vital istics data. The figures published for diabetes ath rates in 1986-88 showed the age-adjusted American Indian death rate was 2.7 times the rate for the general U.S. population[2]. These figures reflect only cases in which diabetes was the underlying cause of death, not those in which it was a contributing cause or those in which diabetes was not listed on the death certificate. Mortality rates by IHS Area are shown in Table 34.3. During 1984-86, there were 1,252 Native American deaths with diabetes listed as a contributing cause of death and 708 deaths with diabetes listed as the underlying cause[54]. In addition, the National Mortality Followback Study found that Native American heritage was underreported on death certificates by 65%[54]. When the 1986-88 relative mortality rates are adjusted for underreporting of heritage, the diabetes mortality for Native Americans is 4.3 times the rate for whites. In a New Mexico study, American Indians experienced 3.6 times the diabetes death rates of whites[55]. Over a 30-year period in New Mexico, diabetes death rates in American Indians increased 550% in women and 249% in men. A mortality study on Canadian Indian reserves in seven provinces found the risk of death from diabetes to be 2.2 times higher for native men and 4.1 times higher for ive women than the rates for the Canadian popula- on as a whole[56].

Detailed mortality studies in Pimas during 1975-84 found that the age- and sex-adjusted death rate from diabetes was 11.9 times greater than the 1980 death rate for all races in the United States[57]. Diabetic nephropathy was the leading cause of death in diabetic Pimas, followed by ischemic heart disease[58]. Longer duration of diabetes (Figure 34.7)[58] and proteinuria[59] were both associated with increased mortality. A 10-year followup of a cohort of diabetic Oklahoma Indians also showed striking death rates: 5% annually for men and 4% for women, which were three and four times the rates expected for men and women in the general Oklahoma population[60]. Circulatory disease

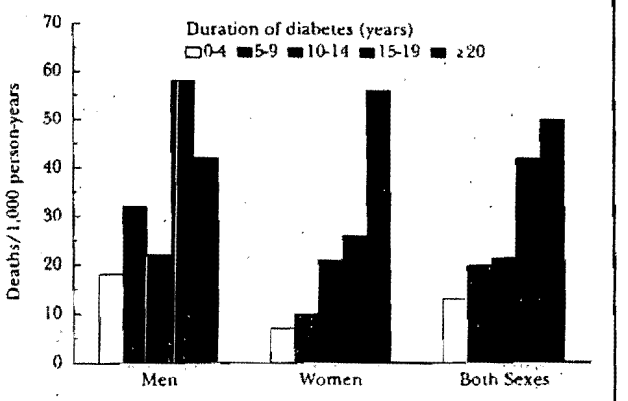
Table 34.3
Age-Adjusted Mortality Rates for Deaths Due to Diabetes, American Indian and Alaska Native Population, 1984-89

	Rate per 100,000 population			
IHS Service Area	1984-86	1985-87	1986-88	1987-89
Total	24.5	25.2	26.2	29.1
Aberdeen	44.7	41.3	35.6	50.1
Alaska	5.7	5.9	5.8	7.6
Albuquerque	25.0	32.4	33.1	32.8
Bemidji	32.9	29.4	28.6	39.0
Billings	24.8	27.8	23.6	40.1
California	10.4	15.2	15.5	15.3
Nashville	30.5	30.4	39.5	45.0
Navajo	21.2	23.8	23.6	27.4
Oklahoma	21.3	20.1	20.6	21.1
Phoenix	54.0	51.4	53.9	53.2
Portland	15.5	18.3	24.2	25.4
Tucson	52.9	59.0	69.6	68.1

Data are for populations residing in the IHS service areas and are age-adjusted to the 1940 U.S. Census; Alaska rates are based on <20 deaths.

Source: Indian Health Service Program statistics

Figure 34.7
Age-Adjusted Mortality of Pima Indians by Duration of Diabetes



Data are for deaths due to natural causes in diabetic individuals age ≥35 years.

Source: Reference 58

causes of death in this cohort exceeded those attributed to diabetes as the underlying cause. Although the contributions of diabetic renal disease and atherosclerotic heart disease to overall diabetes-related mortality vary among tribes, both clearly contribute to the very significant mortality from diabetes in North American Indian communities.

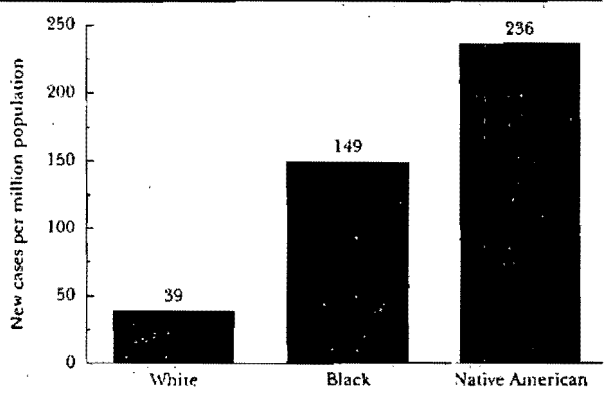
COMPLICATIONS

DIABETIC NEPHROPATHY

End-stage renal disease (ESRD) registries in the United States and Canada have documented that Native American populations are at high risk for entering treatment for kidney failure. During 1981-86, ESRD rates in Canadian Natives were 2.5 to 4 times the national rates, depending on the assumptions used to determine the native population[61]. One-fourth of the ESRD cases were attributed to diabetes. In the United States, the age-adjusted ESRD incidence for Native Americans during 1983-86 was 2.8 times the rate for whites, with 55% of Native American cases attributed to diabetes[62]. In 1987-90, the diabetic ESRD incidence for Native Americans was six times higher than the white rate (Figure 34.8)[63]. Reports from individual tribes confirm that high rates of diabetic renal failure occur in many tribes, including the Navajo, Cherokee, Alaska Native, Sioux, Pima, Zuni, Chippewa, and Oklahoma tribes[14,15,23,64-68]. In Pimas, diabetic nephropathy surpassed ischemic heart disease as the leading cause of nontraumatic death during 1975-84[58].

The natural history of diabetic kidney disease in Pimas has been well defined[69]. Both overt diabetic nephropathy and ESRD increase as the duration of diabetes increases[70]. High blood pressure and hyperglycemia predict the development of overt nephropathy. Similarly, fasting blood glucose and hypertension were found to be significant risk factors for the development of renal failure in Oklahoma Indians[68]. Diabetic offspring who have at least one parent with diabetes and proteinuria are at greater risk to develop nephropathy than diabetic offspring whose parents do not have proteinuria[71]. Studies of glomerular function in Pimas also showed that individuals with recent-onset NIDDM had higher glomerular filtration rates than nondiabetic Pimas[72]. Both clinical and epidemiologic studies have suggested that the natural history of diabetic nephropathy in Pimas is similar to diabetic nephropathy in individuals with IDDM (Figure 34.9)[66,73].

Figure 34.8
U.S. Incidence of Diabetic ESRD, 1987-90



ESRD, end-stage renal disease.

Source: Reference 63

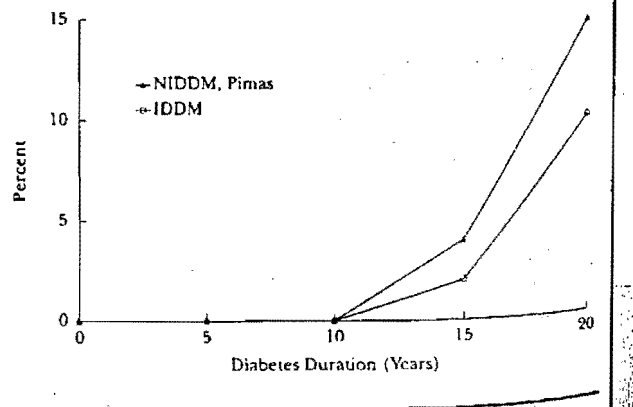
DIABETIC RETINOPATHY

Diabetic retinopathy has been reported in many tribes[13,15,22,74-76]. Detailed studies of the incidence and risk factors for retinopathy have been reported for the Pima and several tribes of Oklahoma Indians[77-83]. Rates of retinopathy and risk factors are summarized in Table 34.4. An association of insulin therapy with diabetic retinopathy similar to that found in U.S. studies has also been found in Native Americans in Canada[84].

LOWER EXTREMITY AMPUTATION

Lower extremity amputation (LEA) rates are unfortunately high in many tribes, although the rates in small

Figure 34.9
Cumulative Incidence of Diabetic ESRD in Pima Indians with NIDDM and in Individuals with IDDM



ESRD, end-stage renal disease.

Source: References 66 and 73

Table 34.4
Diabetic Retinopathy in American Indians

Ref.	Group	Retinopathy (%)	Risk factors
Retinopathy Prevalence			
79	Oklahoma	24.4	Hyperglycemia
75	Oklahoma	49.3	Hypertension
80,82	Pima	18	Duration of diabetes Insulin therapy
Retinopathy Incidence			
81	Oklahoma	72.3	
Proliferative Retinopathy Incidence			
83	Oklahoma (mean 12.7 years followup)	18.5	Hyperglycemia Duration of diabetes Cholesterol Systolic blood pressure Insulin therapy
82	Pima (after 20 years followup)	14	Young age at diagnosis Duration of diabetes Background retinopathy Hypertension Proteinuria Renal insufficiency Neuropathy Cholesterol Insulin therapy

Source: References are listed within the table

studies vary among reservations[13-15,22,23]. During 1982-87, Navajos experienced hospital discharge rates of 74 per 10,000 for LEA, compared with 240 per 10,000 for the Indians of southern Arizona[85]. Ten percent of identified diabetic patients in southern Arizona had a recorded history of LEA on their medical records in 1985-86[6]. Several studies have reported higher LEA rates in males than in females[6,76,85-87]. Duration of diabetes has been reported as a significant risk factor for LEA in several tribes[86,87]. Prospective data on risk of foot ulceration and LEA in Chippewa Indians showed 9.9 times higher foot ulceration rates and 17 times higher amputation rates in diabetic patients without protective sensation, compared with patients who retained the ability to perceive the 5.07 Semmes-Weinstein monofilament[88]. Of 358 diabetic individuals, 7.7% had severe peripheral neuropathy as evidenced by lack of sensitivity to the 5.07 monofilament.

Rates of first LEA in retrospective studies were 13.7 per 1,000 diabetic person-years in Pima Indians (1972-84) and 18 per 1,000 in Oklahoma Indians (1972-80)[86,87]. Hyperglycemia, retinopathy, nephropathy, and signs of neuropathy including medial artery calcification were predictive risk factors for LEA in Pimas[86]. Although amputation rates in Pimas increased with age, the effect of age was not significant after controlling for duration of diabetes. Similar risk factors were reported for first LEA in Oklahoma Indians, although no indicators of neuropathy were reported[87]. Five-year survival after amputation was 40% in Oklahoma Indians and 61% in Pimas[86,87]. Hypertension was a significant risk factor in the Oklahoma tribes but not in the Pima. These variations suggest that peripheral vascular disease and neuropathy may differ significantly among tribes in their contribution to LEA.

PERIODONTAL DISEASE

Periodontal disease rates in Pima Indians were 2.6 times higher in diabetic patients than in nondiabetic individuals[89]. Destructive periodontal disease was also more severe in diabetic individuals[90]. The frequency of edentulousness increased markedly with diabetes duration[91]. At 20 years duration, 75% of diabetic Pimas were edentulous. The presence of retinopathy and poor glycemic control were associated with an increased risk of periodontal disease.

INFECTIONS

Although the pathogenesis of infections as complications of diabetes is not simple, it is clear that infections are of particular importance in Native Americans. Tuberculosis mortality in American Indians in 1987 was 5.8 times higher than the rate for all races in the United States[2]. A case-control study in Sioux Indians showed that diabetic individuals were 4.4 times more likely to develop tuberculosis than nondiabetic individuals[92]. Mortality from infectious diseases in Pimas is significant[57]. Although overall infectious disease mortality rates did not differ between diabetic and nondiabetic Pimas during 1975-84, the number of deaths studied was small[58]. Five of the six deaths from coccidioidomycosis, a disease endemic in the Southwest, occurred in diabetic patients. Similarly, 81% of the 26 cases of necrotizing fasciitis, a rare but severe soft-tissue infection, reported from the Phoenix Indian Medical Center during a 9-year period occurred in diabetic patients[93]. Thus, infections associated with diabetes in Native Americans are of particular concern. Unfortunately, detailed epidemiologic data on the particular associations are lacking for most tribes.

GALLBLADDER DISEASE

Gallbladder disease and diabetes have been linked together in Native Americans as part of a "New World syndrome" with both a genetic and evolutionary basis[94]. In an analysis of gallbladder disease in Pimas

during a 20-year period, no excess risk of death was found in diabetic individuals with gallstones compared with individuals with normal glucose tolerance and gallstones[95]. However, Pimas with gallstones experienced both increased mortality from gallbladder cancer and total mortality from other causes. Overall cancer mortality, however, was not significantly different between diabetic and nondiabetic Pimas[58].

CATARACTS

The incidence of visually disabling cataracts as estimated by first cataract surgery was higher in Pimas, compared with the U.S. population as a whole[96]. After controlling for age and sex, diabetic individuals experienced more than twice the rate of cataract extraction than nondiabetic individuals. Cataract surgery rates increased with longer duration of diabetes and in those treated with insulin.

CARDIOVASCULAR DISEASE

Although our understanding of the epidemiology of cardiovascular disease is incomplete, studies of specific tribes clearly suggest that diabetes is a major risk factor for cardiovascular disease in all Native American populations.

ISCHEMIC HEART DISEASE

Our understanding of cardiovascular disease in Native Americans and its relationship to diabetes and other risk factors is evolving. Rates of ischemic heart disease have changed markedly in recent years, and both the rates and the relative contribution of known risk factors appear to vary among tribes[97]. Ischemic heart disease and stroke rates in Canadian Indians have equaled or exceeded Canadian national rates in recent years, sparing only the more isolated and less acculturated communities[98]. In Pima Indians, a tribe with low coronary heart disease rates, diabetes is a major risk factor for coronary artery disease[99]. All fatal coronary events in Pimas during 1975-84 occurred in diabetic individuals. Reports from many tribes describe myocardial infarction or ischemic heart disease in association with diabetes[13,15,23,100-103]. The Strong Heart Study of diabetic and nondiabetic American Indians age 45-74 years in Arizona, Oklahoma, and North and South Dakota was designed to quantify cardiovascular morbidity and mortality and to compare risk factors among tribes[104]. Major electrocardiogram (ECG) abnormalities were significantly higher in diabetic individuals in all tribes, with the association greatest in Arizona, where cardiovascular disease rates were lowest[105].

The interactions among diabetes and its risk factors and cardiovascular disease are complex and have been studied in detail only in Pimas, where the influence of hyperinsulinemia, insulin therapy, insulin resistance, and hypertension have been examined[106]. In this tribe, neither endogenous hyperinsulinemia nor exogenonous insulin therapy was prospectively associated with ECG abnormalities. In addition, mean blood pressure was not correlated with insulin resistance[107]. Diabetes and insulin resistance, however, were associated with increased levels of very low-density lipoproteins and decreased high-density lipoproteins[108]. In a preliminary report from the Strong Heart Study, rates of hypercholesterolemia varied among different tribes[104]. The WHO study of vascular disease in diabetes also found higher mean cholesterol values in Oklahoma Indians than in Pimas[103]. The relative influences of diabetes and insulin resistance on cardiovascular disease remain unknown.

HYPERTENSION

From the limited data available, hypertension in Native Americans in the United States appears to be less prevalent than in the general U.S. population[105,109]. In Canada, however, a sample of Canadian Indians had higher diastolic blood pressures than the overall Canadian population[99]. Diabetes and hypertension coexist at varying rates in the United States[109]. The relative risk of diagnosed hypertension in diabetic patients compared with nondiabetic individuals ranges from 4.7 to 7.7 in different IHS regions; overall, 37% of ambulatory diabetic patients had diagnosed hypertension. Hypertension in diabetic individuals has been reported in 46.5% of Navajos, 53% of Cherokees, and 48.6% of Canadian Cree and Ojibwa tribes[22,110,111].

STROKE

There is a paucity of published data on stroke rates in diabetic Indians. In Pima Indians, stroke-related mortality did not differ between diabetic individuals and those with normal glucose tolerance; however, the number of stroke events was small[58]. In diabetic Alaska Natives, rates of stroke were similar to rates found in a white diabetic population[23].

DIABETES AND PREGNANCY

DIABETES ANTEDATING PREGNANCY

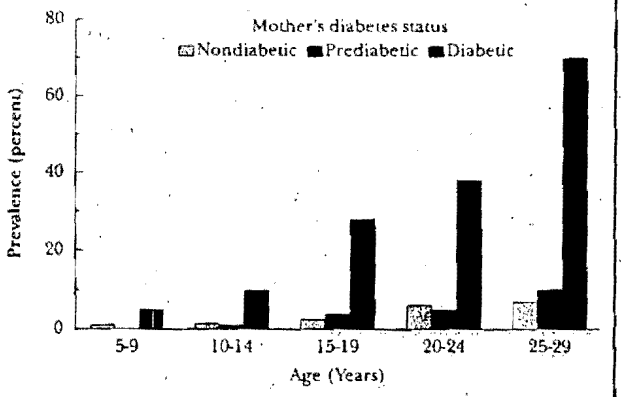
The short- and long-term interactions of diabetes and pregnancy are of major concern for both mother and offspring in Indian communities. Although IDDM is rare in North American Indians, young Pima women with NIDDM antedating pregnancy experienced the same pattern of congenital abnormalities described in pregnancies complicated by IDDM[112]. Diabetes antedated pregnancy in 7 (1%) of 591 Zuni Indian women during 1989-90, and in 38 (2%) of 1,854 Tohono O'odham women during 1984-88[113,114]. In the latter group, gestational diabetes was diagnosed before the 20th week of pregnancy in 25 (42%) of 59 of the gestational diabetic pregnancies, suggesting that diabetes may also have antedated pregnancy in these cases. Preexisting diabetes occurred in 13 (0.3%) of 4,094 Navajo women who delivered during 1983-87 in IHS facilities on the Navajo Reservation[115]. For Pima women, a diagnosis of diabetes antedating pregnancy was associated with increased rates of perinatal mortality, large-for-gestational-age births, toxemia, and Caesarian section, compared with women with normal glucose tolerance[116].

GESTATIONAL DIABETES

Gestational diabetes mellitus (GDM) diagnosed according to O'Sullivan and Mahan criteria has been reported in many tribes with varying rates. For example, 14.5% of pregnancies in Zuni, 3.4% of deliveries in Navajo, and 5.8% of deliveries in Yupik Eskimo women were in women with GDM[113,115,117,118]. Impaired glucose tolerance during pregnancy diagnosed in Pima Indians by WHO criteria was associated with rates of fetal and maternal complications that were intermediate between the rates experienced by normal and overtly diabetic women[25,113,119]. Follow-up studies of American Indian women with a history of abnormal glucose tolerance during pregnancy found high risks of developing subsequent overt diabetes: 27.5% of Pima women developed diabetes within 4-8 years and 30% of Zuni women with GDM developed diabetes within 0.5-9 years[113,119].

The longitudinal studies of diabetes in the Pima community have revealed striking associations of diabetic pregnancy with obesity and diabetes in the offspring[120-123]. By age 20-24 years, offspring of a diabetic pregnancy had a higher rate of diabetes (45%) than offspring of prediabetic women (8.6%) or nondiabetic women (1.4%) (Figure 34.10)[121]. Fasting hyperinsulinemia, obesity, and abnormal glucose tolerance occurred at an earlier age in offspring of women with abnormal glucose tolerance, compared with offspring exposed to normal glucose levels *in utero*[121,122].

Figure 34.10
Prevalence of Diabetes in Pima Offspring by Age and Maternal Diabetes Status



Diabetes defined by 2-hour post-challenge glucose ≥200 mg/dl.

Source: Reference 121

Because of the longitudinal nature of the Pima studies, these data are unique. However, the widespread emergence of NIDDM in Native American children has been noted in both the United States and Canada, suggesting that the interactions of diabetes and pregnancy, which are well described in Pima Indians, are probably not limited to one tribe but pose major public health challenges in many North American indigenous communities[124,125].

HEALTH CARE DELIVERY AND PREVENTION

PREVENTIVE HEALTH SERVICES

The magnitude and scope of health problems related to diabetes in American Indian communities have evoked changes in the health care systems that were originally designed primarily to prevent symptomatic infectious disease and to promote maternal and child health[126]. Efforts to organize consistent preventive health services for diabetic patients and to evaluate patient outcomes in the primary health care setting have used public health techniques such as surveillance and registries[88,127-133]. Programs of high-quality diabetes care have been organized in rural, isolated Native American communities[127,128,133]. These programs incorporate unique features, with each program

designed specifically to promote the involvement of the community it serves. The importance of Native American community involvement in the implementation of practice guidelines was specifically noted by the Expert Committee of the Canadian Diabetes Advisory Board[134]. Today, preventive health care programs in Native American communities combine the strategies successfully used in the past for infectious diseases with the newer diabetes care guidelines. In some cases these preventive strategies overlap. Because of the high risk of the reactivation of tuberculosis in diabetic individuals, the IHS has recommended systematic tuberculosis prophylaxis for diabetic American Indian patients[92]. Effective intervention strategies continue to be studied in the United States and Canada.

EDUCATION

Just as diabetes clinical guidelines have been adapted for the needs of Native American Indians with diabetes, educational programs and materials have also been developed and evaluated systematically to target these cultures[135-137]. Nutrition education has emphasized single-concept messages rather than conventional dietary exchange systems[137]. Diabetes education programs that involve the community have evolved by using a stepwise approach to implementing national diabetes education standards[138]. Native American interpreters trained in diabetes terminology have become crucial to the success of diabetes education in cross-cultural settings[139]. Diabetes training for community health representatives and Alaska village health aides has been organized to promote effective preventive care and education from within the community by mobilizing community health workers.

PRIMARY PREVENTION

Both the historical experience of Native American communities and the growing understanding of the pathophysiologic interactions between genetics and lifestyle suggest that NIDDM can be prevented in Native Americans. In response to the growing burden of diabetes, communities have organized health promotion efforts to increase fitness and decrease obesity[140]. For example, the Pueblo of Zuni has maintained a community-based prevention program for more than 10 years[141,142]. Metabolic control improved in the program's diabetic patients who exercised, compared with patients who did not[143]. A recent retrospective study in Zuni found that even after adjusting for obesity, the odds of presenting with diabetes decreased with increasing exercise frequency in this high-risk community[47]. Diabetes prevention efforts have spread to many Native American communities. These efforts include the revival of traditional physical activities and native foods to promote a healthy lifestyle[140]. Formal clinical trials to test the feasibility of preventing NIDDM will be of major significance to these communities.

PSYCHOSOCIAL AND CULTURAL STUDIES

The growing burden of diabetes in Native Americans has stimulated communities and investigators to ex-

Table 34.5
Psychosocial and Cultural Studies of Diabetes in Native Americans

Books

Diabetes and Native Americans: The impact of lifestyle and cultural changes on the health of indigenous peoples. Joe J, Young R, eds. Moulton Press, Berlin, 1994

Monographs

Diabetes in Canadian native population: Biocultural perspectives. Young TK, ed. Canadian Diabetes Association, 1987

Pine CJ: *Diabetes and behavior: American Indian issues.* American Indian and Alaska Native Mental Health Research. Monograph 1:94-115, 1988

Rokala DA, Bruce SG, Meiklejohn C: *Diabetes mellitus in native populations of North America: An annotated bibliography.* Monograph, Series No. 4. Northern Health Research Unit, Department of Community Health Services. University of Manitoba, Winnipeg, 1991

Articles

Camazine SM: Traditional and western health care among the Zuni Indians of New Mexico. *Soc Sci Med* 14B:73-80, 1980

Hagey R: The phenomenon, the explanations and the responses: Metaphors surrounding diabetes in urban Canadian Indians. *Soc Sci Med* 18:265-72, 1984

Huttlinger K, Krefting L, Drevdahl D, Tree P, Baca E, Benally A: "Doing battle": A metaphorical analysis of diabetes mellitus among Navajo people. *Am J Occup Ther* 46:706-812, 1992

Jackson MY, Broussard BA: Cultural challenges in nutrition education among American Indians. Diabetes Educator 13:47-50, 1987

Lang GC: Diabetics and health care in a Sioux community. *Human Organization* 44:251-60, 1985

Lang GC: "Making sense" about diabetes: Dakota narratives of illness. *Medical Anthropology* 11:305-27, 1989

Miller P, Wikoff R, Keen O, Norton J: Health beliefs and regimen adherence of the American Indian diabetic. *American Indian and Alaska Native Mental Health Research* 1:24-36, 1987

Tom-Orme L: Chronic disease and the social matrix: A Native American intervention. *Recent Advances in Nursing* 22:89-109, 1988

Womack RB: Measuring the attitudes and beliefs of American Indian patients with diabetes. *Diabetes Educator* 19:205-09, 1993

amine traditional and modern perspectives on diabetes. Several anthropologic studies have documented the interpretations of Native Americans affected by diabetes regarding the etiology of the disease, the experience of illness, and the efficacy of treatment. Native American communities perceive diabetes as a new disease that has come from the outside. If approaches to diabetes in both individuals and communities are to be effective, these efforts require appropriate cultural adaption to local health beliefs. Selected references from the growing number of studies are presented in Table 34.5. These studies are the foundation for the important cultural understandings that must develop along with the scientific framework to enable Native Americans to control the diabetes epidemic.

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MESSAGE FOLLOWS

Attached is information about the impact of diabetes in the Native American community. There's a lot of information to choose from. Please feel free to call us if you have any other questions.

DIABETES FACTS

Diabetes Among Native Americans

What is Diabetes?

Diabetes is a disease that affects the body's ability to produce or respond to insulin, a hormone that allows blood glucose (blood sugar) to enter the cells of the body and be used for energy. Diabetes falls into two main categories: type 1, which usually occurs during childhood or adolescence, and type 2, the most common form of the disease, usually occurring after age 40.

Diabetes is a chronic disease that has no cure.

How Does it Affect Native Americans?

Prevalence

- Prevalence of type 2 diabetes among Native Americans in the United States is **12.2%** for those over 19 years of age.
- One tribe, the Pimas of Arizona, have the **highest rate of diabetes in the world.** About 50% of Pimas between the ages of 30 and 64 have diabetes.
- Today, diabetes has reached **epidemic proportions** among Native Americans. Complications from diabetes are major causes of death and health problems in most Native American populations.

Native Americans and Diabetic Complications

The serious complications of diabetes are **increasing** in frequency among Native Americans. Of major concern are increasing rates of kidney failures, amputations and blindness.

- Ten to twenty-one percent of all people with diabetes develop **kidney disease.** In 1992, 19,800 people initiated treatment for **end stage renal disease (kidney failure)** because of diabetes. Among people with diabetes, the rate of diabetic end stage renal disease is **six times higher** among Native Americans.

(over)

- Diabetes is the most frequent cause of non-traumatic lower limb **amputations.** The risk of a leg amputation is 15 to 40 times greater for a person with diabetes. Each year 54,000 people lose their foot or leg to diabetes. Amputation rates among Native Americans are 3 4 times higher than the general population.

- **Diabetic retinopathy** is a term used for all abnormalities of the small blood vessels of the retina caused by diabetes, such as weakening of blood vessel walls or leakage from blood vessels. Diabetic retinopathy occurs in **18% of Pima Indians and 24.4% of Oklahoma Indians.**

What is Needed?

In ideal circumstances, Native Americans with diabetes will have their disease under good control and be monitored frequently by a health care team knowledgeable in the care of diabetes.

- **Patient education is critical.** People with diabetes can reduce their risk for complications if they are educated about their disease, learn and practice the skills necessary to better control their blood glucose levels, and receive regular checkups from their health care team.

- People with diabetes, with the help of their health care providers, should **set goals for better control of blood glucose levels, as close to the normal range as is possible for them.**

- **Health care team education is vital.** Because people with diabetes have a multi-system chronic disease, they are best monitored and managed by highly skilled health care professionals trained with the latest information on diabetes to help ensure early detection and appropriate treatment of the serious complications of the disease. A team approach to treating and monitoring this disease serves the best interests of the patient.

6/97

- The epidemic of type 2 in Native American communities has occurred primarily during the second half of this century.
- Incidence and prevalence of the disease have increased dramatically as traditional lifestyles have been abandoned in favor of westernization.
- Native American communities experience high rates of microvascular complications from diabetes.
- Because American Indians living on reservations are not included in U.S. national health surveys, data on the prevalence of diabetes in Native Americans in the U.S. are limited.
- Diabetes rates are highest in full-blooded Native Americans, than those of mixed ancestry.
- In Pimas, diabetes rates are highest in the offspring of parents who themselves developed diabetes at a young age.
- Gallbladder disease and diabetes have been linked together in Native Americans as part of a "New World Syndrome" with both a genetic and evolutionary basis.
- Cataract surgery rates increased with longer duration of diabetes and in those treated with insulin.
- In Pima Indians, a tribe with low coronary heart disease rates, diabetes is a major risk factor for coronary artery disease.
- Hypertension in diabetic individuals has been reported in 46.5% of Navajos, 53% of Cherokees, and 48% of Canadian Cree and Ojibwa tribes, yet hypertension appears to be less prevalent than in the general U.S. population.
- Longitudinal studies of diabetes in the Pima community have revealed striking associations of diabetic pregnancy with obesity and diabetes in the offspring.
- 60-71 % of Native American women have a body mass index of greater than or equal to 30.
- Diabetes is the third underlying cause of death on death certificates of American Indian women age 65-74 years.
- Mortality attributed to diabetes on death certificates is higher in Native Americans than any other ethnic population. Native Americans have a higher mortality than either whites, blacks, Hispanics, or the general population.

Juvenile

The 24-Hour Day of Diabetes....August 27, 1996

START the clock at 12:00 a.m.

2:00 a.m. I awaken to check on Joey.
Why am I afraid? Because I cannot sleep wondering...Should I test Joey? Should I disturb his sleep so that I can sleep? Tonight I will not test him. His body is warm and his breath is steady. He had enough snack. My only fear is that the exercise he had yesterday will cause him to go low. But tonight for the sake of his peaceful sleep, I will risk the fact that he will be OK through the night. My sleep has been disturbed with worry and now it takes me an hour of time on the computer and the Diabetes Forum to relax and to return to bed at 3:30.

7:50 a.m. I hear my children's voices downstairs as I relax in bed with my husband for a few extra minutes. It is summer vacation, and this is a luxury we don't have for much longer. My husband and I sigh with relief when we hear our son's voice, knowing that he has made it through another night. Diabetes gives me a macabre sense of life. I wake with "Thank God!" every morning. I get up, check my e-mail and enjoy a longer morning than during the school year. Joey's tests and shots wait until 8:00 a.m. in the summer. I answer a letter from another man looking for information about how to start a support group and a branch of JDF.

8:05 a.m. I start the test and shot procedure. Joey's test is 140. I give him his shot and start breakfast. He takes two bites and then he tells me he doesn't feel well. Is this the insulin or what? It happens a lot. So now I will worry until I see him eat. I try not to press because I don't want him to get a complex about his food. It is hard. I finally give him an apple and keep an eye on him for a while until I see what he does eventually eat.

9:00 a.m. I receive a call from Joey's principal. School starts next week and she wants me to come to school on Friday to address the grade school teachers regarding Joey's care for the school year. I did this last year and it worked well. This year they will listen a little better as Joey has been with them for a year and they have seen him have a few lows while in their care. Fortunately, there is an older child with diabetes in the middle school so this is not entirely unfamiliar to the teachers. I will have to spend some time later in the week preparing for this meeting. I will assemble instructions and the accompanying supplies for how to do everything for Joey. We live in earthquake country, and I must assume that the possibility exists that I would not be able to reach him in the event of an emergency. For this meeting, I will specifically concentrate on treating lows. I call his teacher to schedule a private meeting with her after the group meeting.

9:45 a.m. I have to leave the house for errands. I talk to the babysitter and arrange for Joey's snack at 10:00 a.m. He will be active all day, so she needs to be aware that he will need juice o some other simple sugar snack. I put on a pager and head out the door. Joey's father works at home, so I stop by his office, tell him I am going out and ask him to keep an eye on Joey.

5 9

9:55 a.m. Before I leave for errands, I check into the diabetes news group on-line and discover that a very special person with diabetes who was a member of the news group had just died. He was a young man who died alone in his apartment. I am devastated. I cry alone for a few minutes so the children will not see me.

10:00 a.m. I drive my daughter to a friend's house and go to the market. While shopping, I plan for diabetes...food for lows and food to meet Joey's diet needs. I no longer consciously "think" about diabetes, but it is in every food choice.

11:15 a.m. While I am gone Joey's blood sugar is read by my babysitter. He is 54 and needs a snack. This particular babysitter has been trained to give blood tests and to know what to do with what she sees. She gives him a quick juice and an early lunch. She writes his test results down on a pad for me and when I get home I check the number and ask her what actions she took.

11:30 a.m. My pager goes off. I check the number and see it is home. My heart beats louder and more rapidly until I hear that everything is all right with Joey. It is not about him this time, and I am relieved.

12:15 p.m. I run home to drop off the groceries and check on Joey and his brother James. They have been playing hard all morning and Joey looks fine. I remind the babysitter to give him snacks when he's playing sports. I leave to pick up my daughter. Since Joey has had a nice lunch and will be fine for at least an hour, I know it is safe to take my daughter for a quick lunch. We return at 2:30 p.m., just before Joey's snack. During lunch, my daughter and I discuss why I will not be with her for her birthday. I will be in New York for a JDF board meeting. I have to explain to her that it is my job to take care of my family and this is one of the ways I do it. She is very angry and we have a heated but loving conversation. She calls my trip, "that stupid diabetes thing." I worry that my volunteer activities will skew the family more than diabetes already has. I try to remind her of how sad I was until I started doing this work. It is a difficult discussion, but she feels ashamed that she began it and drops the topic. (I realize that these are becoming very personal reflections but I think it is important for you to understand how all pervasive and invasive diabetes can be.)

1:00 p.m. I come home and take my kids to a swimming pool. I always pack a bag and include a juice box. I keep it in front of me as I sit by the pool. The kids like to swim. Swimming is very good exercise but it burns calories quickly, and if Joey is not careful he will have an insulin reaction. My friend drops by with an article on diabetes. I am not in the mood but I discuss it briefly with her.

4:00 p.m. I spend an hour preparing for my JDF branch meeting this Thursday. I have to give a final report on our first fundraiser and introduce a few new business points, but the evening has a special speaker scheduled so I can relax with plans for the night. It is not my turn this month.

5:00 p.m. I prepare dinner. I always make two kinds of dinner -- one for Joey; one for the rest of the family. There are only a few things Joey likes to eat, but I must make sure he gets plenty of carbohydrates.

5:30 p.m. I test Joey. He is hungry and has a blood glucose of 66. I let him have a snack as dinner is still 45 minutes away.

5:45 p.m. I give him his nightly insulin dose. He eats two pieces of bread, a few bites of potato, a little meat, broccoli and juice. I know it is not enough food for the insulin I have given him but I do not fight it. I know he will be hungry later and this will be my chance to get food into him. His sister cuts an apple for him and they go out to play.

6:00 p.m. Joey goes out to swim with his sister. I do not bring juice, but I watch him carefully.

7:00 p.m. "After dinner" is another time of day when we all feel safe to relax and let Joey play without giving too much attention to diabetes. I write on the computer and Joey plays with his brother.

8:00 p.m. Joey is hungry and he eats a peanut butter sandwich and grapes. He has milk before he goes to sleep.

9:00 p.m. I test his blood glucose level. He is 66. He is very happy because this means he can have 8 ounces of milk. He doesn't get milk as much as he used to because I am afraid of the protein in it causing future complications, so he is limited to one large glass of milk a day. He still has an hour of peak left to his regular insulin so I want to make sure that he has enough food for the amount of insulin in him. He will have another snack just before bed.

9:30 p.m. Joey falls asleep before he has his snack. I know he will need more food before I can go to sleep. I accidentally fall asleep watching TV with my youngest son.

10:30 p.m. I awaken in a panic because I forgot to test Joey one more time before I sleep. I ask his father to do this. He tells me that Joey is 64. We give Joey four more ounces of milk and then go to sleep. I hope the peanut butter sandwich he ate earlier in the evening will have enough fat to keep him OK for the night.

11:00 p.m. I fall asleep.

Juvenile Diabetes Foundation International
The Diabetes Research Foundation

FOR IMMEDIATE RELEASE

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Juvenile Diabetes Foundation Applauds President Clinton's Leadership in Bi-Partisan Effort To Include $150 Million for Type I Diabetes Research in Balanced Budget

Mary Tyler Moore represents 16 million Americans threatened by diabetes at Presidential Announcement

New York, NY (August 8, 1997) – **Mary Tyler Moore and volunteers of the Juvenile Diabetes Foundation International (JDFI) gathered in Washington today to applaud President Clinton's leadership in a Bi-partisan effort to include $330 million for new diabetes programs in the Balanced Budget Act of 1997 – in particular, the $150 million that is provided for Type I diabetes research programs.**

In addition to other important initiatives, The Act provides for $30 million per year for five years for innovative research and treatment programs focusing on the prevention and cure of Type I diabetes.

"Insulin is not a cure," said Mary Tyler Moore, JDFI's International Chairman. "With this initiative, we can capitalize on years of research progress and start to move advances out of the laboratories to the bedsides of our loved ones."

"With the tremendous human and economic tolls taken by this devastating disease and its complications, it is more than appropriate that a full frontal attack on diabetes be launched by the federal government," said Robert Wood Johnson IV, Chairman of JDFI. "This long awaited increase contains a significant infusion of new funds for research into Type I diabetes, and provides renewed hope for millions of Americans."

"Diabetes has reached epidemic proportions worldwide and the numbers are steadily increasing," stated James E. Mulvihill, D.M.D., President and CEO of JDFI. "We know that this extraordinary initiative will help attract the attention of our leading scientists, and encourage them to apply their knowledge to the complex and myriad problems of diabetes in new and imaginative ways.

The mission of the Juvenile Diabetes Foundation International is to find a cure for diabetes and its complications through the support of research. JDFI was founded in 1970 by parents of children with diabetes who were convinced that through research, diabetes could be cured. With chapters from coast to coast and affiliates around the world, JDFI gives more money to diabetes research than any other non-profit, non-governmental health agency in the world. In 1996, JDFI awarded $30.3 million to diabetes research worldwide, bringing the cumulative dollar commitment to $220 million.

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The National Council on Aging, Inc. Supports the President's Initiative on Diabetes

"According to The National Council on Aging, Inc.(NCOA) nearly 3.4 million older people have diabetes--but do not know it. Older people often suffer complications such as blindness, kidney problems and amputation related to diabetes. Better screening is essential to make sure cases are correctly diagnosed. NCOA strongly supports efforts to develop and disseminate diabetes guidelines to health professionals for appropriate disease management."

-NCOA, 8/6/97