

Articles

The Changing Epidemiology of Diabetes Mellitus Among Navajo Indians

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Although early descriptions of diabetes mellitus among Navajo Indians characterized the disease as an infrequent and "benign chemical abnormality," the prevalence of diabetes and its complications among Navajos appears to have increased substantially in this century. We reviewed recent Indian Health Service inpatient and ambulatory care data and compared these data with previous reports. Of the estimated Navajo population aged 45 years or older, 4,331 (16.9%) had an ambulatory care visit for diabetes between October 1, 1986, and September 30, 1987. Diabetes was coded for 1,041 (7.0%) of hospital admissions of persons aged 20 and older. Of 377 lower-extremity amputations done from 1978 to 1987, diabetes was involved in 245 (66%). The 1986 age-adjusted mortality rate from diabetes was 30.3 per 100,000, approximately twice that for the general US population. The explanation for the increased prevalence of diabetes mellitus among Navajos probably relates to an increasing prevalence of obesity.

(Sugarman JR, Hickey M, Hall T, et al: The changing epidemiology of diabetes mellitus among Navajo Indians. *West J Med* 1990 Aug; 153:140-145)

Non-insulin-dependent diabetes mellitus (NIDDM), a disease that was previously uncommon among Native Americans, has become a major health concern in many American Indian communities.¹ The rising prevalence of diabetes and its complications has been well documented among the Pima Indians of southern Arizona, the tribe that has received the most extensive investigation.²⁻⁴ Studies among the Pimas suggest that environmental influences resulting in increased rates of obesity superimposed on a genetic susceptibility to the disease have contributed to the increased prevalence of diabetes among American Indians.⁵

Although early descriptions of diabetes among members of the Navajo Tribe, the largest tribe in the United States, characterized the disease as a "benign chemical abnormality" rarely accompanied by vasculopathy,^{6,7} more recent studies have found that diabetic Navajos are not spared from the typical vascular complications of diabetes.⁸⁻¹⁰ Nevertheless, a belief persists that diabetic complications remain uncommon among Navajos, and earlier reports are still cited as evidence that Navajos are somehow protected from the sequelae of long-standing diabetes.¹¹

To provide a historical perspective on the changing epidemiology of diabetes among the Navajos, we reviewed recent Indian Health Service (IHS) records regarding diabetes among Navajo Indians and compared these data with those of previous reports.*

The Navajo Tribe

Approximately 180,000 members of the Navajo Tribe reside on a 25,000-sq mi reservation in the southwestern United States. The Navajos are culturally and genetically distinct from many other southwestern tribes. Whereas the Pimas descended from the Mesoamerican Hohokam cultural group and the Pueblo and Hopi tribes from the Anasazi (a separate Mesoamerican cultural group), anthropolo-

gists think that the Navajos descended from Athapaskan peoples who migrated from the north in the 16th century.¹² The recent history of the Navajo people has been marked by a transition from a primarily agrarian life-style of sheep herding and subsistence farming to a wage economy based on the reservation's abundant natural resources.^{13,14} The Navajo population grew from about 88,000 in 1965 to more than 176,000 in 1987 (Indian Health Service, Office of Program Statistics, Rockville, Md). As a result, the Navajo population is younger than the general United States population; more than half the Navajo population is younger than 20 years.¹⁴ Despite changes in the demography of the population, however, the traditional language, religion, and medicine remain as powerful influences in contemporary Navajo culture.^{15,16}

Health care on the Navajo Reservation is provided primarily by the IHS, an agency of the United States Public Health Service. In the Navajo Area, a division of IHS serving most reservation residents, care is provided at 6 hospitals, 7 ambulatory health care centers, and 12 smaller health stations organized geographically into 8 Service Units. Services are provided at no charge in accessible locations across the reservation as shown in Figure 1. Selected patients are referred to surrounding community facilities for specialized care. In addition, some Navajos seek primary care from private facilities on or adjacent to the reservation. No data system exists that can estimate the proportion of Navajo patients who seek care exclusively outside the IHS system, but this proportion is thought to be low because the number of registered patients at Navajo Area IHS facilities is about equal to population estimates derived from census data.

Methods

The IHS collects demographic and clinical information on all outpatient visits and hospital admissions at IHS facilities. In addition, records are maintained for hospital admissions at non-IHS facilities that are reimbursed by the

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The opinions expressed in this paper are those of the authors and do not necessarily reflect the views of the Indian Health Service.

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ABBREVIATIONS USED IN TEXT

- FY = fiscal year
- ICD = International Classification of Diseases
- IHS = Indian Health Service
- NIDDM = non-insulin-dependent diabetes mellitus

IHS Contract Health Service Program. Services performed at Veterans Administration facilities or admissions to a hospital off the reservation that are funded through third-party sources such as Medicaid are not included in the present data. Many patients are transferred back to IHS facilities before their final hospital discharge, however. Residents of the outlying Navajo communities of Alamo, Canoncito, and Ramah are included in this analysis only if they presented for services at Navajo Area hospitals.

All outpatient visits between October 1, 1986, and September 30, 1987 (fiscal year [FY] 1987), for which diabetes mellitus was listed as one of two possible diagnoses were identified. Because the same person may seek care at more than one facility, and medical record numbers are different at different sites, a method was developed to differentiate persons with diabetes. Records were sorted by sex, community of residence, and date of birth; those matching on all characteristics were counted as one diabetic person. The proportion of Navajo IHS beneficiaries with diabetes in selected age groups was then calculated. Population estimates were derived from the 1980 census and projected to 1987 by the IHS (Office of Program Statistics, Rockville, Md).

All hospital records from Navajo Area IHS facilities for FY 1987 listing diabetes (International Classification of Diseases, revised [ICD-9], codes 250.0 to 250.9)¹⁷ as one of six possible discharge diagnoses were selected. Cases of lower-extremity amputations (ICD-9 codes 84.1 to 84.19, or ICD-8 codes 85.5 to 85.9) were identified among all Navajo Area IHS hospital discharges from October 1, 1978, to September 30, 1987 (FY 1979 to FY 1987), from surgical procedures coded at discharge. All hospital discharges for lower-extremity amputations listing a discharge diagnosis with ICD-9 code from 250.0 to 250.9 were considered to be related to diabetes. One of us (J.R.S.) reviewed the remaining medical records of patients with amputations to ensure that diabetes had not been inappropriately omitted from the discharge diagnoses. To determine whether Navajos with diabetes were admitted to hospital with the usual complications of diabetes found in other populations, the number of hospital admissions for selected complications associated

TABLE 1.—Selected Diagnoses for Persons With Diabetes Discharged From Navajo Area IHS Hospitals,*† October 1, 1986–September 30, 1987

Discharge Diagnosis (ICD-9 code)	Patients, No.
Acute and chronic ischemic heart disease (410–414)	96
Renal failure, nephropathy, nephrosis, diabetes with renal manifestations (581, 583, 585, 586, 250.4)	53
Cellulitis, abscess, and other skin infections (681, 682, 686)	64
Chronic ulcer of skin (707)	28
Osteomyelitis, periostitis, and other infections of bone (730)	19
Gangrene (785.4)	35
Ketoacidosis or hyperosmolar coma (250.1, 250.2)	49
Hypoglycemia (251.0, 251.2)	17

IHS = Indian Health Service

*Only the first or second of six possible diagnoses are included.
 †All discharge diagnoses have International Classification of Diseases (ICD-9) codes 250.0 to 250.9.¹⁷

with diabetes among persons admitted in FY 1987 was determined. These complications are reported only if diabetes was coded as one of six possible discharge diagnoses and if the complication was the primary or secondary discharge diagnosis.

A roster of diabetic patients who received care from the Shiprock Service Unit is maintained on a microcomputer at the Shiprock Public Health Service Hospital, a 50-bed inpatient and ambulatory care facility with a catchment population of about 40,000. The roster was compiled using data from outpatient visits and hospital discharge records, as well as from attendance records from the Shiprock Hospital Diabetes Clinic. The year of diagnosis as recorded in the medical record is included in the roster. The year of diagnosis for patients included in the roster as of January 1988 is presented in this report.

The death certificates of American Indians are made available to the IHS by the National Center for Health Statistics. The mortality rate for diabetes as the underlying cause of death (as recorded on death certificates) for deaths occurring in the Navajo Area for 1986 was calculated and age-adjusted by the direct method to the 1980 US population.* This mortality rate was compared with that in the general US population in 1986, age-adjusted to the same population.¹⁸

Results

A diagnosis of diabetes mellitus was recorded for 26,343 (3.9%) of 679,990 ambulatory care visits to Navajo Area IHS facilities in FY 1987. Of the estimated 176,321 Navajos residing on the Navajo Reservation, 5,710 (3.2%) received a diagnosis of diabetes during an ambulatory care visit at a Navajo Area facility. Of the 25,616 persons aged 45 years and older, 4,331 (16.9%) received a diagnosis of diabetes. There were 20,491 admissions to Navajo Area hospitals during the same period. Navajo tribal affiliation was recorded for 19,165 (93.5%) of those admissions. After hospital admissions for childbirth and the puerperium are excluded, 13,738 admissions remained. A discharge diagnosis of diabetes (ICD-9 code 250.0 to 250.9) was recorded for 1,048 (5.1%) of the total admissions, or 7.6% of admissions excluding those for childbirth and the puerperium. There were seven patients younger than 20 years, and three of these were designated as members of tribes other than Navajo according to the IHS records system. When patients younger than 20 years were excluded, diabetes was coded

*Sarah Valway, DMD, MPH, assisted with data analysis.

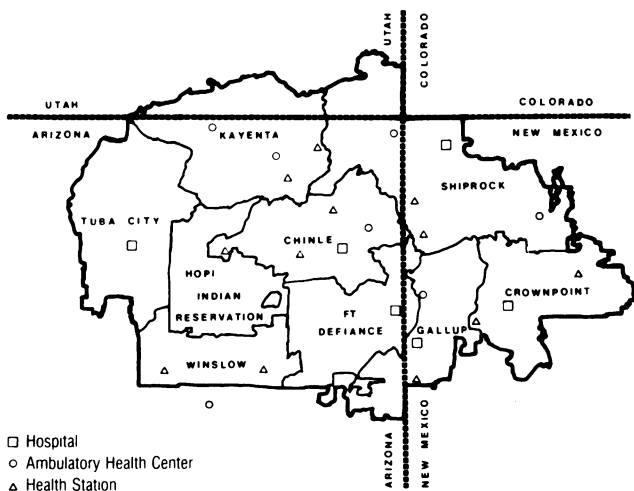


Figure 1.—The map shows the location of Navajo Area Indian Health Service health care facilities.

TABLE 2.—Hospital Discharges for Amputations, Navajo Area IHS Hospitals, FY 1978-1987*

Year	Total Amputations No.	Amputations in Diabetic Persons, No.	Amputations in Nondiabetic Persons, No.	Proportion of Amputations in Diabetic v Nondiabetic Persons, %	Total Amputations/10,000 Navajo Population
1978	36	20	16	55.6	2.75
1979	50	16	34	32.0	3.61
1980	37	28	9	75.7	2.55
1982	42	26	16	61.9	2.74
1983	47	32	15	68.1	2.98
1984	48	33	15	68.8	2.96
1985	38	26	12	68.4	2.28
1986	31	26	5	83.9	1.81
1987	48	38	10	79.2	2.72
1978-1987*	377	245	132	65.0	

IHS = Indian Health Service

*Excluding 1981, for which complete data are not available.

for 1,041 (7.0%) of 14,986 admissions. Of 1,975 admissions to hospitals reimbursed by the IHS Contract Health Service Program, 87 (4.4%) were accompanied by a diagnosis of diabetes. The number of patients discharged from Navajo Area IHS hospitals with selected discharge diagnoses recorded as the first or second of six possible diagnoses that are directly related to diabetes, or for which diabetes is a risk factor, is displayed in Table 1.

From FY 1978 to FY 1987 (excluding FY 1981 for which data were not available), diabetes was associated with 245 (66%) of the 377 lower-extremity amputations carried out in Navajo Area IHS hospitals. The proportion of amputations in persons with diabetes, by year, is presented in Table 2. The FY 1987 amputation rate of 66.5 per 10,000 patients with diabetes is similar to the estimated rate of 59.7 per 10,000 people with diabetes in the United States.¹⁹

The year of the diagnosis of diabetes among 1,265 persons with diabetes listed on the Shiprock Service Unit Diabetes Registry is presented in Figure 2. Although these data do not represent annual incidence rates, they suggest that the number of Navajo Indians with diagnosed diabetes is increasing at a rapid rate.

The 1986 age-adjusted mortality rate for diabetes as the underlying cause of death in the Navajo Area was 30.3 per 100,000, compared with 15.4 for the general US population.

Comment

These data provide compelling evidence that the epidemiology of diabetes mellitus among Navajo Indians has

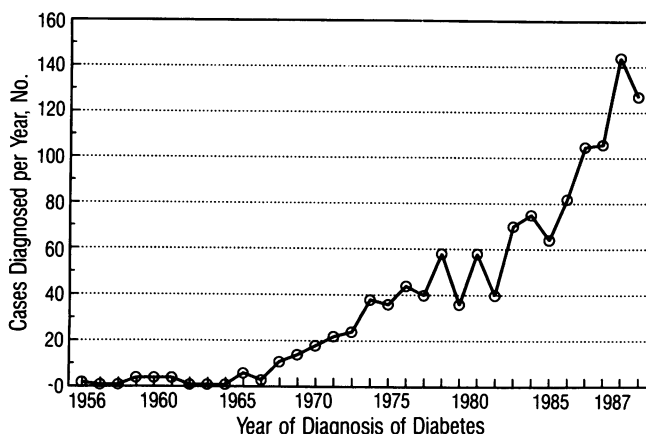


Figure 2.—The year of diagnosis is shown for persons with known diabetes mellitus, Shiprock Service Unit, Navajo Area Indian Health Service, 1987.

changed dramatically during this century. Indeed, from the earliest published data regarding the proportion of diabetes-related hospital admissions among Navajos (Table 3), there were only 5 patients with diabetes out of 25,000 admissions to Sage Memorial Hospital in Ganado, Arizona, between 1931 and 1947.^{20,21} In 1940 the pioneering diabetologist, Elliott Joslin, MD, reported the results of an extensive survey of diabetes in Arizona during which he was able to identify only four cases of diabetes in Navajo Indians.²² Between 1950 and 1952, only 0.6% of Navajos and Hopis admitted to the Phoenix Indian Medical Center had diabetes,²³ a rate that increased to 1% between 1958 and 1965.²⁴

It appears that the prevalence of diabetes among Navajos had begun to increase by the 1960s. Among patients discharged from the Fort Defiance (Arizona) Hospital from 1958 to 1963, diabetes was reported to be present in 0.91% of those older than 20 years and 2.3% of those older than 45.⁶ Between 1963 and 1965, diabetes was identified in 78 Navajos among hospital and clinic patients at the Tuba City Hospital, which served approximately 15,000 Navajos at that time.⁷ In 1971 in a small survey of Navajos aged 35 and older in the Fort Defiance area, 12.8% had carbohydrate intolerance as identified by a plasma glucose concentration of 8.88 mmol per liter (160 mg per dl), or higher, two hours after a 75-gram carbohydrate load.²⁵ Using a two-hour postprandial plasma glucose concentration of 11.1 mmol per liter (200 mg per dl), or higher, the prevalence of diabetes in that population was 11.1% (Peter Bennett, MB, FRCP, FFCM, and Cheryl Ritenbaugh, PhD, MPH, written communication, July 1989). A recent community-based study among Navajos yielded a diabetes prevalence of 10.2% of those between the ages of 20 and 74 (compared with 6.4% in the general US population) and 19.5% among those between the ages of 45 and 74 (compared with about 13% in the general US population).²⁶

The explanation for the increasing prevalence of diabetes and its complications among Navajos is complex. Although it is likely that earlier studies suffered from incomplete case ascertainment, it is doubtful that the diagnosis of diabetes would have been completely overlooked in patients with blindness, renal insufficiency, lower-extremity gangrene, and ischemic heart disease. Increased survivorship among persons with diabetes may account for the rising prevalence of diabetes, as the average life expectancy of Navajo people has increased from 64.9 years in 1973²⁷ to 71.1 years in 1980 (Office of Program Planning and Development, Navajo Area IHS, Window Rock, Arizona, 1986).

TABLE 3.—Rates of Diabetes Mellitus Among Navajo Indians, 1937-1989

Reference	Population	Years of Study	Age of Population, Years	Percent (and number) With Diabetes
Salsbury, 1937 and 1947 ^{20,21} ..	Inpatients, Sage Memorial Hospital, Ganado, Ariz	1931-1947	All	0.02% of admissions (5/25,000)
Joslin, 1940 ²²	Navajo Indians, Ariz	1940	All	< 0.01% of population (4/approximately 50,000*)
Cohen, 1954 ²³	Inpatients, Phoenix Indian Medical Center	1950-1952	All	0.6% of Navajo admissions (NA)
Sievers, 1966 ²⁴	Inpatients, Phoenix Indian Medical Center	1958-1965	≥ 20	1% of Navajo admissions (NA)
Saiki and Rimoin, 1968 ⁶	Inpatients, Fort Defiance Hospital, Fort Defiance, Ariz	1958-1963	All	0.6% of admissions (105/17,557)
			> 20	0.91%
			> 45	2.3%
Prosnitz and Mandell, 1967 ⁷ ..	Outpatients and inpatients, Tuba City Hospital, Tuba City, Ariz	1963-1965	All	0.052% of Navajos in hospital catchment area (78/15,000†)
Sugarman and Percy, 1989 ²⁶ ..	Community based, Teec Nos Pos, Ariz	1986-1987	20-74	9.9% of population (44/444)
			45-74	19.5% (37/190)
Current study	All Navajo Area Indian Health Service Facilities	1986-1987	All	5.1% of admissions (1,048/20,491)
				3.2% of outpatients (5,710/176,321 population)
			≥ 20	7.0% of admissions (1,041/14,986)
			≥ 45	16.9% of outpatients (4,331/25,616)

NA = not available

*Navajo population in 1940 as estimated by Kluckhohn and Leighton.¹³
 †There were approximately 70,000 outpatient visits and 5,000 hospital admissions during the study period (Office of Program Statistics, Indian Health Service, Rockville, Md).

Accurate life expectancy data for Navajos before 1973 are not available, although the mortality rate for both children and adults appears to have fallen continuously from the early 1900s to the 1970s.^{28(p61)} Infectious diseases such as tuberculosis, which was previously epidemic among Navajo Indians, may have shortened the survival of diabetic Navajos before the introduction of effective chemotherapy.²⁹ Diabetic Indians admitted to hospital in the 1950s had more severe tuberculosis than their nondiabetic counterparts.²³

A more plausible explanation for the increased prevalence of diabetes is that the prevalence of obesity, a major risk factor for NIDDM, among Navajo Indians has increased substantially during this century. Several reports suggest that an increase in the prevalence of obesity has occurred in parallel with the epidemic of diabetes. In a 1955 survey of weight and stature among 1,200 Navajos, only 5% of male Navajos and less than 15% of female Navajos were obese as measured by a 1939 "percent of standard weight" criterion.³⁰ The Navajo-Cornell Field Health Study reported that 11% of men and 20% of women among 406 volunteers aged 30 and older were obese by an ideal weight standard, although the specific standard was not mentioned.³¹ In 1979, however, 24% of men and 51% of women in a broad sample of Navajos were found to be greater than 110% of the upper limit of optimal weight for height according to the 1959 Metropolitan Life Insurance tables.³² In a recent study using the National Health and Nutrition Examination Survey (NHANES I) body mass index criterion for overweight, 42.1% of Navajo men and 54.7% of Navajo women aged 20 to 74 were overweight compared with 22.8% and 29.5%, respectively, of men and women in the general US population.²⁶ Despite the variations in the definition of obesity in these studies, there is little doubt that the number of Navajos described as obese has increased during the past 30 years.

This increase in obesity may be attributable in part to the greater availability of calorie-dense food through government commodity food programs and to more access to centers of commerce where "fast foods" and prepared foods of poor nutritional quality are easily available. Although no recent systematic surveys of Navajo dietary habits have been done, high levels of caloric consumption, especially of refined carbohydrate, fat, and sodium, have recently been

noted in the Navajo.¹⁴ Reduced physical activity may also play a role. Until recently, daily subsistence activities and transportation needs required moderate to heavy energy expenditure.^{31,33} The notion of a "thrifty gene" conferring the ability to store calories in times of plenty and release them in times of famine has been proposed to explain the recent increase in obesity and diabetes among other tribes.^{5,34,35} According to this hypothesis, such a gene might confer an evolutionary advantage in cultures susceptible to alternating periods of feast and famine but would be rendered dysfunctional in uninterrupted times of plenty because of the propensity to become obese. Although no evidence exists to give support to the presence of such a gene among Navajos, it is possible that the recent increase in obesity is partially mediated by a heritable factor.

There are several limitations to the estimates of diabetes mellitus made from the ambulatory care and inpatient diagnoses in the present study. A recent review of a random sample of the medical records of Navajo Area IHS patients who were recorded as having an ambulatory visit for diabetes revealed that approximately 13% of the patients did not have diabetes (J.R.S., unpublished data, 1989). The errors were primarily due to an inappropriate coding of testing for diabetes in patients who were not found to have diabetes and to a simple miscoding of unrelated diagnoses. Thus, the above figures overestimate the number of diabetic persons who sought care at Navajo Area IHS facilities during FY 1987. On the other hand, because not all persons with diagnosed diabetes seek care during a given fiscal year, the total number of Navajos with known diabetes may be underestimated by evaluating visits for only one fiscal year. Furthermore, it is likely that a substantial reservoir of undiagnosed diabetes exists among the Navajo population. Thus, the actual prevalence of the disease is likely to be higher than that suggested from reviews of medical records.

Because only the first two of six possible diagnoses were analyzed for Table 1, it is likely that the number of admissions for the complications listed was underestimated. In addition, the total number of hospital admissions for diabetes was probably underestimated, as more than 10% of amputations in diabetic patients were not so identified in the hospital admission data set but were recorded on the medical record review. Although it is likely that some of the

conditions noted in Table 1 are unrelated to diabetes, the large number of hospital admissions for the specific complications of diabetes confirm that Navajos with diabetes suffer from the typical microvascular and macrovascular complications of the disease.

These data are consistent with those of several recent studies regarding diabetic complications among Navajos. Diabetes was present among 21 (34%) of 61 Navajos sustaining myocardial infarction from 1976 through 1979, a proportion that had increased to 78 (50%) of 157 cases by the interval from 1984 to 1986.¹⁰ The incidence of end-stage renal disease caused by diabetes among Navajos is almost 10 times that in the general US population.⁹ High rates of retinopathy have also been reported.⁸ Earlier authors, however, were impressed by the lack of vascular complications among Navajos with diagnosed diabetes.^{6,7} The discrepancy between the observations from the 1960s and those from the 1980s can be at least partially explained by a differing duration of diabetes among the two cohorts. The diabetic patients observed in the earlier reports did not present with diabetes of a long duration. For example, the duration of diagnosed diabetes was more than 10 years in only 5% of the population of Hopis and Navajos studied by Prosnitz and Mandell from 1963 to 1965,⁷ whereas in 1980 Rate and co-workers found that 24% of Navajos in a nearby community had diabetes of 10 years or longer.⁸ In that study, the mean duration of diabetes in patients with vascular complications was 12.4 years compared with 6.9 years in those without complications. The increasing frequency of complications such as retinopathy and nephropathy with increasing duration has been described among the Pimas and among non-Indian populations.^{2,36} Of the patients described in Figure 2, a total of 388 (30.7%) had diabetes of 10 or more years' duration. Thus, it is likely that many patients in previous studies did not have diabetes of a sufficient duration to manifest the typical vascular complications.

Type I or insulin-dependent diabetes mellitus is reported to be rare among American Indians,³⁷ yet we identified ketoacidosis as a reason for being admitted to hospital. Ketoacidosis may occur in persons with NIDDM, especially in those who drink alcohol to excess.^{38,39} Therefore, our data should not be used to argue that type I diabetes occurs among the Navajo. Indeed, the paucity of hospital admissions for diabetes in persons younger than 20 years is consistent with previous observations about the rarity of type I diabetes among American Indians.

The epidemic of diabetes among the Navajo has implications for other Americans. Alaskan Inupiaqs and Yupiks (Eskimos), Indians, and Aleuts have a lower prevalence of diabetes than the general US population, but there is evidence to suggest that the prevalence of diabetes in those populations is rising.⁴⁰ Because Navajos are closely related to the Athapaskan Indians of Alaska, vigorous prevention efforts should be directed toward obesity control in that population. The prevalence of known diabetes among African Americans tripled between 1963 and 1985, whereas the rate among whites about doubled during the same period.⁴¹ Hispanic Americans have a higher prevalence of diabetes than does the US white population, and the prevalence of diabetes among Hispanics increases with an increasing percentage of Native American genetic admixture.⁴² Thus, a study of the progress and control of the epidemic of diabetes among Navajo Indians may provide important information for other populations as well.

Contrary to earlier beliefs, diabetes among Navajo Indians clearly is not a benign form of hyperglycemia. Rather, the typical vascular complications of the disease are impor-

tant causes of morbidity and mortality among Navajos. The reported prevalence of the disease has increased substantially in the past half-century, probably because of a parallel increase in obesity. To decrease the consequences of diabetes among Navajo Indians, current diabetes control activities should focus on obesity control, early diagnosis and treatment of diabetes, and vigorous monitoring for complications in diabetic patients.

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Book Review

The Western Journal of Medicine does not review all books sent by publishers, although information about new books received is printed elsewhere in the journal as space permits. Prices quoted are those given by the publishers.

California Physician's Legal Handbook—1990

Catherine I. Hanson, Astrid G. Meghriyan, Alice P. Mead, and John H. Gilman, California Medical Association. Sutter Publications, Inc, PO Box 7690, San Francisco, CA 94120-7690. 600 pages, spiral bound; \$85, CMA members; \$185, nonmembers.

California physicians have long needed a legal handbook for their own guidance to avoid having to make calls to medical societies or to their attorneys for every little issue that arises in practice: How do I dismiss a patient from my care legally and amicably? How do I transfer a patient from one hospital to another? How do I deal with investigations by a medical licensing board? How do I establish and charge fees for being an expert witness? All of these questions are covered by the *California Physician's Legal Handbook*. This handbook can become your consultant.

A whole section covers the current reasoning behind our ability to let patients forgo treatment. Of particular importance is the material directly related to the durable power of attorney for health care. All physicians should become familiar with this document and should use it for their own lives as well as having copies available for their patients. The handbook will help you learn how to use the document.

Some problems do not have easy answers. For instance, how long should medical records be kept? The usual response is at least a bit longer than the statute of limitations for malpractice litigation, which means more than three years after the last treatment for adults. Because these statutes are not always reliable, however, the better course of action is to keep all records for a minimum of 10 years after the last time the patient was seen, or at least until the minor has become 19 years of age—provided the child had not been seen in the previous 10 years. With an abundance of caution, the handbook suggests an across-the-board retention of 25 years after the last treatment.

Who can legally determine competency for consent purposes? This is regularly asked during Ethics Rounds at the University of Southern California School of Medicine, and the answer is not always obvious. Many think that only courts can decide the issue of competency. Others believe only psychiatrists can answer that question. In reality, clinicians do it every day. It involves two questions: Can the patient understand the nature and consequences of his or her condition and the proposed treatment, and can the patient communicate his or her decision? This does not require a psychiatric diagnosis or assessment, and the people preparing the handbook were smart enough to state that very clearly. They also go on to advise that where the issue is a close one, a physician needs to talk to the people surrounding the patient—family, friends, other physicians caring for the patient, and anyone else personally familiar with the patient and available to discuss the problem. This section in the handbook is particularly well drafted.

The presentations in this handbook go beyond the strict statement of the law. They get down to the nitty gritty of day-to-day problems physicians and their office staff face. For this reason the handbook will be of immense value. It will be updated annually.

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