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ABSTRACT

This annotated bibliography, part of a series of bibliographies on rehabilitation of Native Americans who are disabled, focuses on diseases and other medical issues related to disabilities. The bibliography lists and describes a total of 77 books, dissertations, conference proceedings, journal articles, and reports issued between 1967 and 1985. Entries are presented alphabetically by author. (JDD)

Native American Rehabilitation: A Bibliographic Series, No. 7

Medically Related Disability Issues

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Keres Word: Thoughts or concepts to consider

Research Report

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Native American Rehabilitation: A Bibliographic Series, No. 7

Medically Related Disability Issues

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Introduction

The information listed here is intended to provide consumers, policy makers, direct service providers, researchers, advocates, and parents with a synthesis of knowledge regarding key issues related to the rehabilitation of Native Americans who are disabled. The Bibliographic Series consists of seven key topical areas including: (a) assessment issues; (b) rehabilitation issues; (c) special education issues; (d) family issues; (e) mental health issues; (f) health care issues; and (g) medically related disability issues.

Selection Process

Materials for inclusion in the Bibliographic Series were identified through a comprehensive search of relevant databases. The years of the computerized search included 1966 to 1986, varying across databases, depending on the availability of computerized material and the comprehensiveness of the database within this time period. The databases included in the search were: (a) ERIC (Educational Resource Information Center); (b) BRS (Bibliographical Retrieval Services: attitudes, education, intellectual development, language, and rehabilitation); (c) NARIC (National Association of Rehabilitation Information Center: RehabData); (d) Dialog (ABI/Inform, Medline, PscyhInfo, Sociological Abstracts); and (e) FAMULUS.

In addition, materials identified by the Native American Research and Training Center research staff through journal content analysis were included. Materials identified through this first step were then individually reviewed for inclusion based on the criteria outlined below.

Selection Criteria

Materials were selected for inclusion in the Bibliographic Series if the information was relevant to one of the seven identified topical areas. In addition, material that was identified from non-computerized sources and consisted of

incomplete bibliographic information such that the material could not be located through assistance from the library, or by writing the authors, was excluded. Abstracts were rewritten when necessary to provide further clarity of the study findings. The materials selected here represent what is believed to be a comprehensive summary of information related to the seven topical areas.

MEDICALLY-RELATED DISABILITY ISSUES

Aase, J. (1981). The fetal alcohol syndrome in American Indians: A high risk group. Neurobehavioral Toxicology and Teratology, 3(2), 153-156.

In 1979, Indian Health Service (IHS) identified fetal alcohol syndrome (FAS) as the primary "target problem" to be addressed during the Year of the Child. A pilot project was started in the states of Arizona and New Mexico to achieve the following goals: (a) establish a mechanism with IHS for the recognition and habilitation of children with FAS; (b) obtain estimates of the "minimal prevalence" of this disorder and the load it places on the health care system; and (c) establish whether or not the American Indian population is a high risk group for FAS. Since the project was only in the fourth month, prevalence data was not available. However, the author provided supporting evidence on cultural, social, environmental, and biological aspects which point toward an increased risk of FAS in American Indians.

All Indian Pueblo Council. (1982). Fetal alcohol syndrome resource guide. Rockville, MD: Indian Health Service.

This guide was developed as a resource to assist professionals working with American Indians in obtaining printed and non-printed materials on Fetal Alcohol Syndrome (FAS). The resource guide was divided into the following sections: films, books, bibliographies, pamphlets, posters, slides, training curricula, and projects. Each section included a description of the materials, including cost and availability.

Archer, W. E., Gillam, J. D., & Wagoner, J. K. (1976). Respiratory disease mortality among uranium miners. Annals of the New York Academy of Sciences, 271, 280-293.

A mortality analysis was conducted on a group of Anglo and Indian uranium miners using a life-table method. A significant excess of respiratory cancer cases was found among both Anglos and Indians. Other findings included: (a) nonmalignant respiratory disease deaths are approaching cancer in importance as a cause of death among the Anglo

group, probably as a result of diffuse parenchymal radiation damage; (b) exposure-response curves for non-smokers are linear for both respiratory cancer and "other respiratory disease," and cigarette smoking elevates and distorts these curves; and (c) light cigarette smokers appear to be as vulnerable to lung parenchymal as heavy smokers.

Armstrong, H., & Patterson, P. (1975). Seizures in Canadian Indian children: Individual, family and community approaches. Canadian Psychiatric Association Journal, 20(4), 247-255.

The authors described the family and cultural environment of more than 13 children who had hysterical seizures and who lived in a remote northern Ontario Indian village. These teenagers experienced intense conflict between their aspirations to join the affluent Anglo world and their need to accept the prohibitions and limitations of their Indian village. Two visiting psychiatrists interpreted these conflicts in 13 of the children, and made management recommendations to their parents and to community leaders, aimed at removing the secondary gains the children got from the seizures. After the psychiatrists' three-day visit, there was a marked decline in frequency of seizures.

Bennett, P. H., Bogardus, C., Foley, J., Knowler, W. C., & Pettitt, D. J. (1984). Determinants and pathogenesis of non-insulin-dependent diabetes in the Pima Indians. In F. Labrie & L. Proulx (Eds.), Endocrinology (pp. 257-259). Phoenix, AZ: Elsevier Science Publishers B.V.

This study was conducted with the Pima Indian population of Arizona which has the highest recorded frequency of diabetes. Specifically, the non-insulin-dependent diabetes mellitus (NIDDM) in the Pima is related to: (a) interactions of age; (b) degree of obesity and pre-existing evidence of glucose intolerance; and (c) presence of diabetes in one or both parents. Evidence that diabetes has genetic determinants are: (a) familial aggregation of the disease; (b) decreasing frequency of disease in those with non-Indian admixture; and (c) association of the disease with a specific genetic marker. Impairment of insulin-mediated glucose disposal appeared to be a critical component in the development of the disease. The mechanism of impaired glucose disposal appeared to be a post-binding defect in insulin

action. Longitudinal studies on the development of NIDDM will lead to greater understanding of the relationship between the genetic determinants and the defect in insulin action.

Bennett, P. H., Harris, M., & Murphy, R. S. (1982). Geographic and ethnic differences in diabetes frequency in the Americas. In E. N. Mngola (Ed.), Proceedings of the 11th Congress of the International Diabetes Federation (pp. 131-136). Amsterdam-Oxford-Princeton: Excerpta Medica.

Among Native Americans, a wide spectra of diabetes rates of prevalence have been reported. Among the Eskimo and Athabaskan Alaskan Natives, extremely low prevalences of diabetes existed 20 years ago, but in many other Indian tribes the frequency of diabetes occurs at significantly higher rates with a major increase in the past 40 years. The apparent increase in the frequency of diabetes in American Indians could be attributed to changes in environmental factors, although factors such as the degree of obesity do not explain all of the variation. The authors concluded that it seemed almost certain that genetic factors play an important role and interact with environmental factors, such as obesity.

Bettman, J. W. (1972). Eye disease among American Indians of the Southwest (I: Overall Analysis). Archives of Ophthalmology, 88(3), 263-268.

A review of the clinical records of 1,543 American Indians revealed that: (a) malignant melanoma occurs less often among American Indians than in the general population (not a single case in the records reviewed); (b) primary open-angle glaucoma and inferotemporal dialysis occur with approximately the same frequency as in the general population; (c) trachoma, retinoblastoma, phakomorphic angle-closure glaucoma, and iridocyclitis associated with active pulmonary tuberculosis occur more frequently than in the general population; and (d) prevalence of retinoblastoma was six times greater than in the general population. Mature cataracts and phakolytic glaucoma may occur more commonly in Indians, and some diseases have a tribal predilection.

Bettman, J. W. (1973). Eye disease among American Indians of the Southwest (II: Trachoma). Archives of Ophthalmology, 20(6), 440-446.

Data was analyzed to determine the extent of trachoma among southwestern American Indians. Eye examinations totaling 2,881 were conducted on two groups: (a) eye clinic patients at the Gallup Indian Medical Center; and (b) elementary and high school children residing in the Navajo area. Active trachoma was observed most frequently in Indians under 20 years old. Complications of blindness occurred principally in middle-aged and older adults. The goal of medical therapy was to minimize the progress of trachoma in the second stage to reduce scarring and pannus formation. In the most recent series of cases on the Navajo reservation, 71% of the patients responded well to therapy with trisulfapyrimidines, and an additional 9% healed spontaneously. A rash occurred in 5.2% and Stevens-Johnson syndrome occurred in 0.15%. Results of penetrating keratoplasty for severely scarred corneas were disappointing--only 45% of the corneas transplanted during this study were still functioning satisfactorily after 6 months to 4.5 years.

Brandfonbrener, M., Lovekin, W. S., & Leach, J. K. (1970). Cardiomyopathy in the Southwest American Indian. British Heart Journal, 32(4), 491-496.

Six southwestern American Indian patients were diagnosed as having either primary myocardial disease or congestive heart failure of unknown cause (conditions which seemed to be common among American Indians). The patients ranged in age from 41 to 84 years. Their tribal affiliations were: (a) Navajo, (b) Laguna, and (c) Isleta. This study was an investigation of factors which are perceived as having a significant role in the etiology, including: (a) lineage (number of parents/grandparents from same tribe); (b) acculturation (traditional being the least); (c) family history of heart disease; (d) diet; and (e) alcohol consumption. Discussion based on observations, examinations, and medical and dietary histories were included.

Brosseau, J. D., Eelkema, R. C., Crawford, A. C., & Abe, T. A. (1979). Diabetes among the three affiliated tribes: Correlation with degree of Indian inheritance. American Journal of Public Health, 69(12), 1277-1278.

Diabetes mellitus occurs at rates higher than the general population for many Indian tribes. The increase of diabetes among some tribes is attributed to changing lifestyles of Indian people. The authors examined the extent of diabetes among the Three Affiliated Tribes of North Dakota--Mandan, Arickara, and Hidatsa. Active health records of all three tribes who are served by Fort Berthold Indian Health Service Clinic constituted the data for this study. There were 3,719 Indians and 442 Anglos with complete health records. Diabetes below the age of 35 years was uncommon for all racial subgroups. Rates of diabetes were highest for full-inheritance (8/8 degree of Indian blood) Indians over the age of 35 years (22.3%). Indians of 4/8 or less degree of inheritance had a rate of diabetes equivalent to that of Anglos (4.1%). In this study, Mandans had the highest rate of diabetes (39%). Females comprised 51% of the population and 55% of the known diabetics. There were no visible differences in lifestyles, diets, or environments of the racial subgroups. Data did suggest a strong hereditary tendency of adult-onset of diabetes for Indians in this study. Since findings from this study are based only on the known cases of diabetes, the authors caution that the rates of diabetes derived through this study may represent an underestimate of the true prevalence. Further, rates may vary according to degree of racial admixture.

Creagan, E. T., & Fraumeni, J. F., Jr. (1972). Cancer mortality among American Indians. Journal of the National Cancer Institute, 49(4), 959-967.

In studies since 1908, low frequencies of cancer have been reported for American Indians as compared with Anglos and other racial groups. In this study, data was analyzed for the 18-year period from 1950-1967. The findings provided a contrast of cancer mortality rates between Indians and rates among Anglos and Blacks. Gallbladder cancer

significantly higher than the reported rate among both Anglo and Black males and females in the United States. Findings from this study were consistent with earlier studies which indicated cancer mortality among American Indians is much lower than for other racial groups in the United States. The authors cautioned that these findings are based on liabilities in Indian mortality statistics like deficient census estimates, death certification practices, and incomplete diagnosis and reporting of disease. Despite these biases in statistical data, available evidence continues to suggest a true deficit in Indian cancer mortality.

Doyle, P. J., & Morwood, D. (1976). Middle ear disease in Native Indian children in British Columbia--incidence of disease and an evaluation of screening methods. Journal of Otolaryngology, 5(2), 103-115.

A total of 1,109 Indian children in five British Columbia communities were surveyed for middle ear disease. Evaluation included a history, pure tone screening, impedance audiometry, and otolaryngological examination. Results of the evaluation indicated that 12.7% of the children had middle ear disease requiring treatment, namely serious otitis media, perforated tympanic membrane, or cholesteatoma. Serious otitis media was the most common disease and was most prevalent in children 0-4 years old. Although pure tone audiometry and impedance audiometry were the screening methods used for this study, both were considered unsatisfactory. Tests were difficult to conduct on the majority of patients 4 years of age or younger, and test results showed both a high incidence of false positive results as well as a significant incidence of false negative results. A program of screening and continued evaluation was recommended including local health care personnel, audiologists, and otolaryngologists.

Faulkner, H. W. (1971). Pseudo-exfoliation of the lens among the Navajo Indians. American Journal of Ophthalmology, 72(1), 206-207.

Fifty consecutive new patients, aged 60 years and older, attending the eye clinic at the USPHS Indian hospital in Tuba City, AZ, were evaluated for pseudo-exfolation of the

lens capsule. Nineteen (38%) of the patients had bilateral pseudo-exfoliation and were hospitalized for treatment. Diagnosis of pseudo-exfoliation was made by observing the typical dandruff-like deposits on the interior lens capsule, pupillary margin, and trabecular meshwork.

Forman, M. R., Graubard, B. I., Hoffman, H. J., Beren, R., Harley, E. E., & Bennett, P. (1984). The Pima infant feeding study: Breast feeding and respiratory infections during the first year of life. International Journal of Epidemiology, 13(4), 447-453.

Initial episodes of upper respiratory infection, otitis media, and pneumonia identified from medical records in the first year of life were analyzed in relation to feeding practices among 571 infants born 1960-1977 on the Gila River Reservation. The odds ratio of developing a first episode of upper respiratory infection or otitis media during the first year was less than unity for infants exclusively breastfed for 4 months compared to exclusively bottlefed infants after logistic regression adjustment for seasonality, birthweight, and adverse social conditions (OR=0.64). However, a significant benefit of early exclusive breastfeeding was no longer seen during months 9-12. Exclusive breastfeeding for 4 months marginally reduced risk of pneumonia after adjustments for covariates. The authors concluded that these data suggest that breastfeeding of infants in early life is associated with reduced risk of respiratory infection.

Friederich, R. (1982). Eye disease in the Navajo Indians. Annals of Ophthalmology, 14(1), 38-40.

The ocular disease distribution and causes of blindness in Navajos were discussed. Trauma, usually associated with alcohol ingestion, was the most common cause of monocular blindness. Corneal scars, glaucoma, and retinal detachment were other leading causes of blindness. Stage IV trachoma was frequently seen in the elderly, but active trachoma was present in only about 1% of Navajo children, a dramatic decline from the past. Review of records revealed that 28% of the patients had external eye disease, 22% had trauma, and 22% had no significant pathologic condition.

had trauma, and 22% had no significant pathologic condition.

Garber, J. M. (1984). Steep corneal curvature: A fetal alcohol syndrome landmark. Journal of the American Optometric Association, 55(8), 595-598.

Keratometry was performed on 30 fetal alcohol syndrome (FAS) and fetal alcohol effect (FAE) children. Horizontal keratometric measurements that are 46.00 diopters or greater appeared to be an objective landmark of FAS. Keratometry was recommended as a routine test when evaluating children suspected of having FAS.

Garber, J. M. (1982). Corneal curvature in the fetal alcohol syndrome: Preliminary report. Journal of the American Optometric Association, 53(8), 641-644.

In a preliminary report of the ocular characteristics of fetal alcohol syndrome (FAS), 17 Southwestern Indian children with FAS were examined for ocular care. Of the 17 children examined, 12 could be measured with keratometry. All of the children examined had corneal curvature of 5.75 or greater, with an average horizontal curvature of 47.55 diopters and an average vertical curvature of 49.35 diopters. Steep corneal curvature was found to be a significant characteristic among these children with FAS.

Garber, J. M. (1981). High corneal astigmatism in Navajo school children and its effect on classroom performance. Journal of the American Optometrists Association, 52(7), 583-586.

This study included 809 Navajo school children, grades K-6, in which visual acuities and keratometry readings were collected for each child. Statistical analysis included: (a) the degree of corneal curvature of two diopters or more and the distribution of its ranges; (b) grade distribution; (c) sex distribution; (d) unilateral percentage and eye dominancy; (e) uncorrected visual acuities of the high uncorrected astigmatism; (f) the mean corneal astigmatism; and (g) the relationship between uncorrected high astigmatism and classroom performance.

Garber, J. M., & Hughes, J. (1983). High corneal astigmatism in the adult Navajo population. Journal of the American Optometric Association, 54(9), 815-818.

Corneal astigmatism was measured in 176 unselected Navajo patients over the age of 45 years. The results indicated a 4% incidence of with-the-rule astigmatism of two diopeters or more in at least one eye. The authors discussed reasons for the low incidence of corneal astigmatism in the adult Navajo population as compared to the high incidence that occurs in Navajo children. Possible explanations for this phenomenon were given with encouragement and suggestions for further research.

Garber, O. (1985). The relation of astigmatism and hyperopia (more effective plus). Journal of the American Optometric Association, 56(6), 491-493.

Two hundred and ninety-eight high astigmatic refractive errors were reviewed in order to establish the clinical and theoretical relationship of high astigmatism to hyperopia. All methods of analysis demonstrated that high astigmatism and greater plus power are related. With these results, the author established a relation between high astigmatism and hyperopia (or more effective plus) and discussed the clinical and theoretical considerations of such a relationship. High astigmatism with its racial dominance, meredional amblyopia, and hyperopic association, remains one of the most interesting and challenging refractive problems that the clinician faces. The scientific verification and causes of these associations have served as challenges to all disciplines of eye care.

Gerdes, J. S., & Murphy, S. (1985). Cystic fibrosis in Pueblo Indian children. Clinical Pediatrics, 24(2), 104-106.

Three Pueblo Indian children with cystic fibrosis were described. The three cases constituted a higher incidence of cystic fibrosis in Pueblo Indians than would be expected from the known rarity of this disease in American Indian populations. These cases of cystic fibrosis within the six-year period of this study yield an incidence of 1 in 3,100, similar to the Caucasian rate. Reasons for the appearance of an autosomal recessive disease

in the southwest American Indian population were discussed including new genetic mutations, in-breeding, and genetic drift or founder effect.

Goodwin, M. H., Jr., Shaw, J. R., & Feldman, C. M. (1980). Distribution of otitis media among four Indian populations in Arizona. Public Health Reports, 25(6), 589-594.

This study was undertaken to characterize the occurrence of otitis media among selected Arizona Indian populations in an effort to define attributes to assist in identifying individuals and groups most likely to be affected adversely. The subjects were members of the Hopi, Navajo, San Carlos Apache, and Colorado River Indian tribes being treated at health facilities in the project areas. Results of the study indicated that the majority of initial attacks of ASOM (acute supparative otitis media) occurred in the first year of life and second episodes were most likely to occur within four months of the first attack. The frequency of subsequent attacks were significantly higher among children who experienced their initial attack before 1 year of age.

Gottlieb, L. S., & Husen, L. A. (1982). Lung cancer among Navajo uranium miners. Chest, 81(4), 449-451.

Historically, lung cancer had been a rare disease among the Indians of the southwestern United States. However, the advent of uranium mining in the area has been associated with an increased incidence of lung cancer among Navajo uranium miners. All Navajo men, miners and non-miners, admitted to the Shiprock PHS hospital and Navajo Family Health Center from February, 1965, to May, 1979, were included in this study. Of the 17 male patients with lung cancer, 16 (94.1%) were uranium miners and one (5.8%) was a non-miner. The low frequency of cigarette smoking in this group (12 of 16) supported the view that radiation was the major initiating agent of lung cancer among the study sample. Mean length of time of exposure to radiation in the mines was 11.9 years.

Gregg, J. B., Roberts, K. M., & Colleran, M. J. (1983). Ear disease and hearing loss, Pierre, South Dakota, 1962-1982. South Dakota Journal of Medicine, 36(10), 9-17.

To assess the efficacy of measures employed to control and prevent otitis media, 220 pre-school children residing in Pierre, South Dakota, underwent clinical evaluations to document the frequency and the severity of otitis media in the Native American population. This report compared these recent findings (1982) with earlier studies performed in the 1960s. Cautious extrapolation between these studies suggested that although otitis media is still prevalent in Pierre, there is presently less structural damage to the sound conduction mechanism than in the past. In addition, asymptomatic otitis media occurred in 10% of the children evaluated in 1982. The authors concluded that otitis media should still be suspected in fussy children, those with unexplained fevers, and whenever there are unexplained gastrointestinal symptoms.

Gregg, J. B., Steele, J. P., Clifford, S., & Werthman, H. E. (1970). A multidisciplinary study of ear disease in South Dakota Indian children. South Dakota Journal of Medicine, 23(9), 11-20.

In this study, 385 Indian children were examined by a speech and hearing analyst, an otolaryngologist, and by radiologists with radiographs of mastoid cells. The purpose was to determine the validity of audiometric testing to diagnose ear disease. The results revealed that audiometric testing failed to identify active ear disease in three individuals (.8%) within the test group. Residual changes from previous, probably infectious, ear disease found in 130 ears showed no signs of hearing impairment. The efficiency of these children in school was not impaired. The fact that these children had scarred drums but normal hearing would suggest that the ear mechanism has the ability to withstand the onslaught of infection and repair itself functionally. The authors concluded that the audiometric tests described in this study yield reliable data when screening large groups of school-age populations.

Hamman, R. F., Bennett, P. H., & Miller, M. (1978). Incidence of diabetes among the Pima Indians. Advances in Metabolic Disorders. 9, 49-63.

The highest prevalence of diabetes in the world has been recorded among the Pima Indians. In this study, a total of 1,355 Pima Indians aged 15 and older were followed prospectively during 1965-73 for the development of diabetes mellitus. Diabetes was defined as appearance of a 2-hour plasma glucose greater than 250 mg/dl or the institution of treatment with insulin or hypoglycemic medications. Of the initial examination in 1965, 75.3% of the test group were not diabetic, but were considered at-risk for developing diabetes. One hundred and thirty-two cases of diabetes developed over the period of the study or 12.9% of the baseline population. Life table methods, used to correct for differing periods of follow-up, estimated a crude annual probability of developing diabetes of 29.6/1000, the highest reported incidence of diabetes in the world.

Harris, R. L., & Riley, H. D., Jr. (1968). Cystic fibrosis in the American Indian. Pediatrics, 41(4), 733-738.

Cystic fibrosis is a generalized, familial disorder exhibiting a marked ethnic variation. In this article, the authors presented the first two cases of this disorder reported in the American Indian population. The family pedigrees of these patients were described and certain genetic aspects of this disease were discussed. Possible anthropological reasons for the occurrence of this disease in this racial group were mentioned.

Henry, R. E., Burch, T. A., Bennett, P. H., & Miller, M. (1969). Diabetes in the Cocopah Indians. Diabetes, 18(1), 33-37.

One hundred and eighty-two Cocopah Indians, aged 5 years and over, representing 81% of the study population, were given a 75 gm. glucose equivalent load and determinations were made 2 hours later of plasma glucose levels. At the time of the study, 17% of the Cocopah population were either receiving hypoglycemic therapy or had plasma glucose levels of at least 160 mg. per 100 ml., which was considered indicative of "diabetes." The prevalence of diabetes among Cocopahs aged 35 years and older was

34%, similar to the rate reported for the Cherokee population but lower than the rate among the Pimas. The frequency of obesity was higher among Cocopahs age 15 and older than among the Pima Indian population. However, this factor did not account for the differences in the prevalence of diabetes between the Cocopah and Pima tribes because the rate of diabetes was lower among the Cocopah population.

Hilton, G. F., & Richards, W. W. (1970). Retinal detachment in American Indians. American Journal of Ophthalmology, 70(6), 981-983.

During an 8-year period, 26 eyes of 21 American Indian patients from Arizona were operated on for retinal detachment. Within this relatively confined, homogenous, ethnic group, the incidence of retinal detachment was 1 in 19,000 individuals per year. The maximal rate occurred in the third decade of life. The authors reported that the most frequent retinal break was retinal dialysis, occurring in 69% of eyes, and 78% of the phakic eyes and concluded that trauma did not account for this high incidence of dialysis.

Howard, B. V., Lisse, J. R., Knowler, W. C., Davis, M. A., Pettitt, D. J., & Bennett, P. H. (1982). Diabetes and atherosclerosis in the Pima Indians. Mount Sinai Journal of Medicine, 49(3), 160-175.

The authors reported diabetes among the Pimas appears to be associated with increased atherosclerotic cardiovascular disease (ASCVD) as evidence by more electrocardiogram (EKG) abnormalities and greater prevalence of ASCVD at autopsy. It was concluded that diabetes is a risk factor for ASCVD even though this population has a low background propensity for cardiovascular disease. However, the macrovascular disease was not as strongly related to hyperglycemia as was microvascular disease. Furthermore, the authors pointed out that other aspects of the diabetic state may also contribute to ASCVD. Recommendations for further studies were provided to examine the relationship of factors such as insulin concentrations, blood pressure, mode of treatment, and duration of diabetes to ASCVD.

Ingelelfinger, J. A., Bennett, P. H., Liebow, I. M., & Miller, M. (1976). Coronary heart disease in the Pima Indians. Electrocardiographic findings and postmortem evidence of myocardial infarction in a population with a high prevalence of diabetes mellitus. Diabetes, 25(7), 561-565.

The frequency of electrocardiographic evidence of coronary heart disease (CHD) and the rate of autopsy-proved myocardial infarction were determined in the Pima, a tribe of American Indians with a high incidence of diabetes mellitus. The frequency of CHD as evidenced by major Q-wave changes in the Pima was about one-half that found in Tecumseh, Michigan. The relatively low rate of myocardial infarction at autopsy (15% of males and 8% of females aged 40 years and over) was consistent with the low prevalence of Q-wave changes. Subjects with diabetes had a higher rate of CHD than nondiabetics, both electrocardiographically and at postmortem examination, although the differences were not statistically significant. The low prevalence of CHD in the living Pima and the low rate of infarction at autopsy indicate that this tribe has a low frequency of CHD despite the extraordinarily high prevalence of diabetes mellitus.

Johnson, R. L. (1967). Chronic otitis media in school age Navajo Indians. Laryngoscope, 77(11), 1990-1995.

In this study, 3,318 Navajo children attending boarding school were examined to determine the prevalence of otitis media. Survey findings showed that the incidence of otitis media was 15 times (7%) greater than the general population, with one-fourth of the reported cases having bilateral occurrences. Many of the children needed surgical repair to arrest infections and to restore some hearing. The author concluded that contributing factors appeared to be lack of effective treatment at the onset of infection as well as existing poverty conditions. Recommendations included increasing the otologic staff at Indian Health Service clinics.

Kaplan, G. J., Fleshman, J. K., & Bender, T. R. (1973) Long term effects of otitis media: A ten year cohort study of Alaskan Eskimo children. Pediatrics, 52, 1963-1973.

During the first 10 years of life, 489 children were followed to determine if otitis media had a detrimental effect on intellectual functioning. The authors found that significant loss of verbal ability and lags in reading, mathematics, and language occurred in children who had frequent episodes of otitis media before age 2 and a hearing loss of 26 db or greater. Children who had inflammation early but later normal hearing were affected in verbal areas. There was a correlation between the number of episodes, hearing loss, and low verbal and achievement scores. The authors concluded that the occurrence of otitis media at critical developmental language stages along with the frequency of otitis media episodes contribute significantly to verbal retardation.

Katzeff, H. L., Savage, P. J., Barclay-White, B., Nagulesparan, M., & Bennett, P. H. (1985). C-peptide measurement in the differentiation of Type 1 (insulin-dependent) and Type 2 (non-insulin-dependent) diabetes mellitus. Diabetologia, 28, 264-268.

To determine whether individual subjects with Type 1 (insulin-dependent-diabetes) or Type 2 (non-insulin- dependent) diabetes, who are treated with insulin, could be reliably distinguished, C-peptide concentrations and urinary C-peptide excretion were measured in 10 Caucasoids and 10 Pima Indians. The group of Caucasoids were assumed almost certainly to have Type 1 diabetes. The Pima participants were believed to have Type 2 diabetes. Based on the study results, the authors concluded that among patients with early onset diabetes mellitus, who have been treated with insulin, C-peptide measurements in fasting blood or 24-hour urine collections can be used to categorize subjects into insulin-dependent and non-insulin-dependent groups, provided that overt renal disease is not present.

Kirkwood, C. R., & Kirkwood, M. E. (1983). Otitis media and learning disabilities: The case for a causal relationship. The Journal of Family Practice, 17(2), 219-227.

The authors reviewed the hallmarks of otitis media, including decreased hearing and delayed language acquisition, and the characteristics of learning disabilities. Further analysis of studies which provide evidence that a relationship exists between otitis media and learning disabilities strongly suggested that the relationship is causal in spite of methodologic limitations of some individual studies. The authors indicated that if a causal relationship is accepted, then otitis media in early childhood will be regarded as a disease with significant long-term morbidity that deserves careful follow-up.

Knowler, W. C., Bennett, P. H., Hamman, R. F., & Miller, M. (1978). Diabetes incidence and prevalence in Pima Indians: A 19-fold greater incidence than in Rochester, Minnesota. American Journal of Epidemiology, 108(6), 497-505.

The incidence and prevalence of diabetes mellitus were determined in 3,733 Pima Indians, aged 5 years and over, through examinations conducted over a 10-year period. Examinations included modified glucose tolerance tests and medical record review. Prevalence was low in childhood and plateaued at 40-50% in adults over 35 years of age. The age-sex adjusted incidence rate of 26.5 cases/1,000 person-years is the highest reported diabetes incidence known to the authors. Incidence increased from low levels in childhood, peaking at age 40 for males and age 50 for females. Diabetes incidence was 19 times greater than that in the predominantly Anglo population of Rochester, Minnesota. This high incidence rate was found despite use of a more stringent diagnostic criterion than customarily employed, and was not due to biased follow-up of subjects.

Knowler, W. C., Carraher, M. J., & Pettitt, D. J. (1983). Diabetes mellitus, obesity and cholelithiasis. In L. Capocaccia, G. Ricci, F. Angelico, M. Angelico, & A. F. Attili (Eds.), Epidemiology and Prevention of Gallstone Disease (pp. 85-91). Hingham, MA: MTP Press.

In the late 1960s, a gallstone survey was conducted among the Pima Indians.

cholecystography, was unrelated to relative body weight in either men or women. The total prevalence of gallbladder disease was also unrelated to diabetes, although in an earlier report of clinically diagnosed disease only, diabetes occurred more frequently in men with gallstone disease than in men who did not have gallstone disease.

Knowler, W. G., Pettitt, D. J., Bennett, P. H., & Williams, R. C. (1983). Diabetes mellitus in the Pima Indians: Genetic and evolutionary considerations. American Journal of Physical Anthropology, 62(1), 107-114.

The authors described the traditional agricultural lifestyle of the Pimas and the consequences of their adaptation to a lifestyle which is similar to that of non-Indians. Neel (1962) suggested that the introduction of a steady food supply to people who have evolved a "thrifty genotype" leads to obesity, insulin resistance, and diabetes. Findings of research conducted with the Pimas included differences in insulin sensitivity in different metabolic pathways, suggesting that the thrifty genotype involves the ability of insulin to maintain fat stores despite resistance to glucose disposal. The authors concluded that the recent increase in diabetes incidence among the Pimas may be attributed to the past ability of this population to store energy efficiently during cycles of feast and famine, which now leads to obesity, insulin resistance, and diabetes.

Knowler, W. C., Pettitt, D. J., Savage, P. J., & Bennett, P. H. (1981). Diabetes incidence in Pima Indians: Contributions of obesity and parental diabetes. American Journal of Epidemiology, 113(2), 144-156.

The incidence of diabetes mellitus was determined in 3,137 Pima Indians during periodic examinations that included measurement of weight, height, and glucose tolerance. Incidence was strongly related to preceding obesity. The authors found little relationship between diabetes prevalence and concurrent obesity, which illustrates the importance of longitudinal studies in estimating the effect of obesity on the occurrence of a disease for which weight loss is a manifestation. The article noted that both obesity and diabetes have

become more common among the Pimas during this century, perhaps as a result of rapid cultural and dietary changes in a population genetically susceptible to diabetes.

Lanier, A. (1977). Survey of cancer incidence in Alaskan Natives. National Cancer Institute Monographs, 47, 87-88.

A survey was conducted from 1969 through 1973 to determine the incidence of cancer among Alaskan Natives. Results of the survey revealed fewer cases overall than expected in relation to rates in the United States. However, significantly increased risks for acquiring cancer were seen for certain areas of the body: the nasopharynx in both sexes (with excesses over 15-fold); the liver in males; and the salivary glands, gallbaladder, kidney, and thyroid in females. Compared with earlier reports, the observations suggested marked changes in cancer incidence among Alaskan Natives over the past two decades, with declines in esophageal and invasive cervical cancers, and increases in neoplasms of the lung, colon, and rectum.

Leviton, A. (1980). Otitis media and learning disorders. Developmental and Behavioral Pediatrics, 1(2), 58-63.

The author reported that children who have or have had otitis media are at greater risk for language and related learning disabilities. Seven hypotheses were postulated by the author based on research done by others in the field. These hypotheses were identified as follows: (a) children with serious otitis media are at increased risk for hearing impairments; (b) children with hearing impairment (of whatever etiology) are at increased risk for a learning disorder; (c) children with serious otitis media are also at risk for learning disorders; (d) those children at risk for hearing impairment can benefit from preventive therapies which reduce the risk of learning disorders; (e) among children with persistent hearing impairment, amplification and education programs reduce the risk of learning disorders; (f) in children at risk of hearing impairment, therapies to prevent impairment also reduce the risk of psychiatric disorders; and (g) among children with

persistent hearing impairment, amplification and education programs reduce the risk of psychiatric disorders.

Long, T. P. (1978). The prevalence of clinically treated diabetes among Zuni Reservation residents. American Journal of Public Health, 68(9), 901-903.

The author examined the medical records (N=268) of all Zunis treated for diabetes mellitus at the Zuni Comprehensive Community Health Center during 1975 and 1976. Results of the case review indicated a high prevalence of diabetes mellitus among all age groups over 25 when compared with the general population. The author attributed this higher rate among the Zunis to both hereditary and environmental factors. The key environmental factors mentioned were high-caloric diet and sedentary lifestyle, which contributed to obesity. Other findings stated were that at least 25% of the Zuni Reservation population over age 45 has diabetes, with females in this age-group having a significantly higher rate of diabetes than males.

Mason, L. D. (1972). Disabled fisherman: Disease and livelihood among the Kuskowagamiut Eskimos of lower Kalskag, Alaska. Dissertation Abstracts International, 33(7), 2910B. (University Microfilms International No. DDJ72-33953)

The relationship between disability and economic productivity was studied in an Eskimo settlement on the Kuskokwim River in southwestern Alaska. The research was based on the proposition that diseases originally introduced by Anglos immeasurably disrupted traditional Kuskowagamiut modes of livelihood by encouraging participation in the cash-oriented economic system. Underlying patterns relating to disabilities were investigated. It was concluded that two-thirds of the adult males were chronically disabled or handicapped in their activities. Disability forced many into a dependency relationship with other villagers and outside agencies, which reduced self-sufficiency.

May, P. A. (1982). Report on outreach efforts and analysis of approach: A pilot project on fetal alcohol syndrome for American Indians. Rockville, MD: Indian Health Service.

The Fetal Alcohol Syndrome (FAS) Project of the Indian Health Service was designed to: (a) identify existing cases of FAS among selected American Indian tribes (Navajo, Apache, Ute and Pueblo Tribes); (b) establish a referral system to identify these children for treatment; (c) estimate the prevalence of the problem; and (d) work towards prevention of future cases. From the inception of the project to October 15, 1981, a total of 208 training sessions were held, where 9,556 individuals were trained to recognize FAS and milder alcohol damage for accurate referral, and to counsel and advise clients in the prevention of FAS. Twenty clinics were held in 15 locations and an average of 9.8 children were seen per day. An analysis of the diagnoses of 205 children indicated: (a) 30.2% of the children were diagnosed as having FAS; (b) 15% were diagnosed with fetal alcohol effect; (c) 6.8% of the children had a diagnosis of "suspicion of pre-natal damage;" and (d) 47.4% were either diagnosed "normal" or had another type of birth defect.

May, P. A., Hymbaugh, K. J., Aase, J. M., & Samet, J. M. (1983). Epidemiology of fetal alcohol syndrome among American Indians of the southwest. Social Biology, 30(4), 374-385.

The epidemiological features of fetal alcohol syndrome (FAS) were examined among American Indians in southwestern states. All FAS suspects were screened in specific populations of Navajo, Pueblo, and Plains Tribes. A total of 115 alcohol-affected children were identified. The incidence of FAS was found to be highly variable from one cultural group to the next, ranging from 1.3 per 1,000 births among the Navajos to 10.3 per 1,000 births for the Plains Indians. The pattern of age-specific prevalence indicated an increase over the past 15 years. The overall rate of mothers who produced FAS children was 6.1 per 1,000 women of childbearing age, with a range of 4 to 33 per 1,000. These maternal prevalence rates were important for the accurate

child had also produced others. Other findings indicated that the mothers of these children led highly disruptive and chaotic lives and were frequently isolated from mainstream social activities. The authors concluded that, in general, the gross social and cultural patterns of the groups studied can readily explain the variation in incidence of FAS.

McShane, D., & Mitchell, J. (1979). Middle ear disease, hearing loss and educational problems of American Indian children. Journal of American Indian Education, 19(1), 7-11.

Previous studies have identified certain children to be at risk for chronic middle ear infection. Rates for middle ear disease in the general population have been reported at 5%, while rates for American Indian children have been estimated at 20% to 70%. It has also been shown that mild to moderate conductive hearing loss interferes with the development of language, increases educational difficulties and causes specific processing problems. The authors contended that detrimental effects of middle ear disease in Indian children are seriously complicated and heightened by cultural difference factors. They reported that educational consequences of this type of hearing problem can be reduced by providing an appropriate environment to minimize the auditory deprivation.

McShane, D. A., & Plas, J. M. (1982). Otitis media, psychoeducational difficulties, and Native Americans: A review and a suggestion. Journal of Preventive Psychiatry, 1(3), 277-292.

This article reviewed multi-disciplinary literature on the etiology, incidence, pathogenesis, and developmental consequences of middle-ear disease among Native American and Alaska Native children. The authors noted that the wide variety of hypotheses among the literature focused on the presence of otitis media in children and the presumed consequences for development of language and academic achievement. Two recommendations were provided: (a) development and implementation of

preventive measures; and (b) additional developmental research with Native American children.

Nelson, S. M., & Berry, R. I. (1984). Ear disease and hearing loss among Navajo children--A mass survey. Laryngoscope, 94(3), 316-323.

A team of trained technicians in a specially equipped mobile van conducted a mass screening effort on the Navajo Reservation from 1978 to 1980 to detect and refer individuals with ear disease and hearing loss. A total of 15,890 school children were examined. The authors presented prevalence data and correlations of hearing level with ear disease: (a) 4.0% of the children had tympanic membrane (TM) perforations; (b) 2.3% had middle ear effusions; (c) 1.9% of the children had TM atelectasis; and (d) 0.4% had sensorineural hearing loss. Microtia was found in 1,935 children screened and the occurrence of cholesteatoma was rare. The authors concluded by contrasting patterns of ear disease with other groups.

Nickoloff, E. G. (1975). The hearing-impaired American Indian in the vocational rehabilitation process. Dissertation Abstracts International, 36(8), 5250A-5251A. (University Microfilms International No. ECD76-03799)

The author examined selected medical, educational, vocational, and psychological variables relative to the hearing-impaired Native American client during the vocational rehabilitation process. Each of these variables had a direct impact on whether or not a client achieved successful rehabilitation closure. Various demographic characteristics of the sample which were examined indicated: (a) three times as many males were referred for rehabilitation services as females; (b) two-thirds of the clients lived on reservations; (c) the mean age of the sample was 24.9 years; (d) 64% of the sample were never married; and (e) the mean level of formal education was 9.2 years. Findings showed that: (a) hearing-impaired Indians with an etiology of otitis media were successfully closed more often than those who lost their hearing because of congenital conditions; (b)

males achieved successful rehabilitation more often than females; (c) marriage made no difference as to successful rehabilitation; and (d) as the years of education increased, so did the chances of successful closure. The amount of money spent in all phases of the rehabilitation process showed conflicting patterns. The chance for successful rehabilitation increased as more money was spent for training and for the entire rehabilitation process. However, as the amount of money spent for living expenses decreased, the number of successful rehabilitants increased.

Nielson, A. L. (1973). Remediation of language skills of Navajo children. Colorado Journal of Educational Research, 13(1), 10-12.

Pre- and post-tests of the Peabody Picture Vocabulary Test (PPVT) and the Assessment of Children's Language Comprehension (ACLC) were administered to 65 Navajo children with hearing impairments. A comparison between the pre- and post-test scores showed 52% of the children increased their scores and 48% decreased their scores. On the ACLC, 56 of the children increased their scores. The increased scores on ACLC were possibly due to: (a) intensive receptive language instruction; (b) training dormitory attendants to reinforce the day's teaching; and (c) emphasis on English syntax. The author concluded that the PPVT is not appropriate for use with Navajo children.

Petitt, D. J., Baird, H. R., Aleck, K. A., Bennett, P. H., & Knowler, W. C. (1983). Excessive obesity in offspring of Pima Indian women with diabetes during pregnancy. New England Journal of Medicine, 308(5), 242-245.

The authors investigated the relation between obesity in offspring of Pima Indian women and diabetes during pregnancy. Sixty-eight children of 49 women who had diabetes during pregnancy had a higher prevalence of obesity, as compared with 541 children of 134 women who subsequently had diabetes (prediabetics), or compared with 1,326 children of 446 women who remained non-diabetic. These findings indicated that obesity in the offspring was directly related to maternal diabetes, since the association was not substantially confounded by maternal obesity. The authors concluded that these

findings strongly suggest the pre-natal environment of diabetic women effects the development of obesity in childhood and early adulthood of the offspring.

Pettitt, D. J., Lisse, J. R., Knowler, W. C., & Bennett, P. H. (1982). Mortality as a function of obesity and diabetes mellitus. American Journal of Epidemiology, 115(3), 359-366.

Mortality according to body mass index (weight/height) was studied in 2,197 Pima Indians aged 15-74 years as part of the longitudinal study of diabetes begun in 1965 in the Gila River Indian Community of Arizona. The authors noted that the Pima Indians are a population with a high prevalence of obesity, and they have the highest known incidence of type II (non-insulin dependent) diabetes mellitus. Results of the study showed: (a) among males, mortality was greatest in those with a body mass index of at least 40 kg/m2, but obesity had little effect on mortality at body mass indices below 40 kg/m2; (b) age-specific death rates in women were not consistently related to obesity, although mortality in subjects with diabetes was higher than in those who were non-diabetic; and (c) diabetes had little effect on mortality among males.

Pinkerton, R. E., & Badke, F. R. (1974). Coronary heart disease: An epidemiologic study of Crow and Northern Cheyenne Indians. Rocky Mountain Medical Journal, 71(10), 577-583.

In this retrospective study, the incidence of coronary heart disease among the Crow and Northern Cheyenne Indian populations was compared using the Farmingham Heart Study. The Farmingham Study was chosen since it was a long-term (14 years) comprehensive investigation of an Anglo, middle class population. Utilizing inpatient hospital records and a population census, the authors found that, except for Cheyenne men, the rate of myocardial infarction among Crow and Cheyenne parallels or exceeds the rate reported in the Farmingham Study for both men and women. These results indicated considerably more coronary heart disease among Crow and Cheyenne populations than previous studies have reported for other American Indian tribes.

Prosnitz, L. R., & Mandell, G. L. (1967). Diabetes mellitus among Navajo and Hopi Indians: The lack of vascular complications. American Journal of Medical Science, 253(6), 700-705.

Characteristics of diabetes mellitus among Navajo and Hopi Indians were examined. In general, diabetes in this group tended to be a disorder remarkably free of the vascular complications which are usually associated with this disease. Only one case of coronary artery disease and two cases of peripheral vascular disease were found among 101 patients, despite a relatively high incidence of hypertension. Diabetic retinopathy was also infrequent. The authors discussed possible reasons for these findings.

Rate, R. G., Knowler, W. C., Morse, H. G., Bonnell, M. D., McVey, J., Chervenak, C. L., & Smith, M. G. (1983). Diabetes mellitus in Hopi and Navajo Indians: Prevalence of microvascular complications. Diabetes, 32(10), 894-899.

In a cross-sectional study of Hopis and Navajos with non-insulin dependent diabetes mellitus, the authors found that vascular complications were strongly related to the duration of diabetes. In patients with diabetes of at least 10-years duration, retinopathy was found in 57%, nephropathy in 40%, peripheral neuropathy in 21%, and peripheral vascular disease in 28%. For both Hopis and Navajos, the duration-specific prevalence rates of microvascular disease were very similar to prevalence rates found in many other populations. The authors challenged findings, based on reports in the late 1960s, that Hopis and Navajos have hyperglycemia as an isolated chemical abnormality unaccompanied by other manifestations of diabetes mellitus.

Reed, D., & Dunn, W. (1970). Epidemiologic studies of otitis media among Eskimo children. Public Health Reports, 85(8), 699-706.

This study focused on epidemiological patterns of otitis media among Alaska Eskimos. Over a 12-month period, the authors observed occurrences of otitis media of children residing in six Eskimo villages. The usual treatment of otitis media was compared with a regimen designed for remote areas. Study results indicated that middle-ear infections occurred during the first two years of life in almost two-thirds of the Eskimo

children observed. Once affected, these children had a much higher risk of episodes of otitis media, and of a subsequent hearing deficiency, than children who were not affected by otitis media during their first two years of life.

Reid, J. M., Fullmer, S. D., Pettigrew, K. D., Burch, T. A., Bennett, P. H., Miller, M., & Whedon, G. D. (1971). Nutrient intake of Pima Indian women: Relationships to diabetes mellitus and gallbladder disease. American Journal of Clinical Nutrition, 24(10), 1281-1289.

A detailed diet survey of Pima and Papago women was undertaken with two objectives: (a) to determine whether an association exists between dietary intake of selected nutrients and prevalence of either diabetes mellitus or gallbladder disease; and (b) to ascertain whether dietary intake of some nutrient(s) changed with age among patients with and without diabetes mellitus or cholelithiasis in the following 10 years. A total of 277 women (91% of the total female population) 25 to 44 years of age were interviewed from the Pima Reservation. The results showed that the Pimas main diet consisted of beans, chili and tortillas. Diabetics showed significantly lower total carbohydrate and sucrose intakes than non-diabetics. Women working outside the home had a significantly lower caloric intake and a higher animal protein intake. No association was indicated between dietary intake of selected nutrients and the prevalence of either diabetes or gallbladder disease.

Rivera, M. L. (1982). Auditory manifestations of the fetal alcohol syndrome in a predominately American Indian population. Dissertation Abstracts International, 43(3), 672B. (University Microfilms International No. DA8218879)

This investigation was designed to study the auditory manifestations of Fetal Alcohol Syndrome (FAS). Subjects (11 females and 6 males) were recruited, ranging in age from 11 days to 14.3 years. The ethnic constituency of the group was predominately American Indian. There were no occurrences of severe or profound sensory neural hearing loss among the study sample. However, results indicated a higher-than-expected incidence of auditory deficiencies in this FAS group with a smaller number than would be expected in a

normal population. Data suggested that these auditory effects may demonstrate the adverse properties of potential ethanol ototoxicity during intrauterine development.

Rossi, D. F. (1972). Hearing deficiency in Pueblo Indian children: Results of a mass screening program. Rocky Mountain Medical Journal, 69(10), 65-69.

This study was based on results from screenings of 504 New Mexico Pueblo Indian children, 3 to 11 years of age, as part of the Otitis Media Project. Results indicated more than twice as many hearing impairments due to excessive noise exposure than hearing deficits of other types. The author questioned whether such noise-related hearing losses may be caused by occupations involving jewelry-making in the Indian population. Acoustic impedance measurements were used to support the presence of conductive dysfunction which may provide a significant breakthrough in the earliest possible diagnosis of middle ear disease in young children.

Samet, J., Kutvirt, D., Waxweiler, R., & Key, C. (1984). Uranium mining and lung cancer in Navajo men. New England Journal of Medicine, 310(23), 1481-1484.

In this study, a population-based case-control study was performed to examine the association between uranium mining and lung cancer in Navajo men, a predominantly non-smoking population. The authors reviewed all cases of lung cancer (N=32), as documented by the New Mexico Tumor Registry, which occurred among Navajo men between 1969 and 1982. For each case in a Navajo man, two controls with nonrespiratory cancer were selected. Of the 32 Navajo patients, 72% had worked as uranium miners, whereas no controls had documented experience in this industry. The lower 95% confidence limit for the relative risk of lung cancer associated with uranium mining was 14.4. Information on cigarette smoking was available for 21 of the 23 affected uranium miners: eight were non-smokers, and median consumption by the remainder was one to three cigarettes daily. These results demonstrated that, in a rural, non-smoking population,

most cases of lung cancer may be attributable to one hazardous occupation which exists within the community.

Sandor, G. G. S., Smith, D. F., & MacLeod, P. M. (1981). Cardiac malformations in the fetal alcohol syndrome. Journal of Pedriatics, 28(5), 771-773.

The authors presented the cardiac findings of 76 children (69 American Indians and 7 Caucasians) with documented features of fetal alcohol syndrome (FAS). The sample consisted of 43 males and 33 females, ranging in age from birth to 18 years. The authors concluded that the increased incidence of ventricular septal defect (VSD) in this population may help to explain the different distribution of lesions between this and other series of cardiac malformation in patients with or without FAS.

Savage, P. J., Hamman, R. F., & Bennett, P. H. (1979). Prediabetes in the Pima Indians. Advances in Experimental Medicine and Biology, 119, 13-19.

The authors examined the changes associated with the development of diabetes among the Pima Indians. It was noted that the Pimas have the highest known prevalence of ketosis-resistant diabetes mellitus. Results of the study indicated a complex interrelationship between three factors, all of which contribute to the prediabetic state: (a) family history; (b) degree of obesity; and (c) the initial 2-hour plasma glucose level. The authors suggested that a diabetic parent may contribute to the development of diabetes in offspring by initially pre-disposing the child to obesity, followed, after some period of years, by the development of impaired glucose tolerance. The authors also noted that unexplained hyperinsulinemia had been found among the Pimas. It was concluded that further studies be conducted to elucidate the relationship of hyperinsulinemia to the development of obesity.

Schrader, E. S. (1980). Caring for Indian children with otitis media. AORN (Association of Operating Room Nurses) Journal, 31(6), 997-1006.

This article described the efforts to treat otitis media in the Pediatrics Unit of the Phoenix (Arizona) Indian Medical Center. This narrative account followed the treatment of several children who were diagnosed with otitis media. The author stressed the team approach used by the Center, which involved a variety of staff to insure proper treatment for each child. In addition, the need existed for more Indian nurses who could serve Indian patients.

Seshia, S. S., Rjani, K. R., Boeck, R. L., & Chow, P. N. (1978). The neurological manifestations of chronic inhalation of leaded gasoline. Developmental Medicine and Child Neurology, 20(3), 323-324.

Abnormal neurological signs were found in 46 of 50 children and adolescents chronically sniffing leaded gasoline. The abnormalities were resolved within eight weeks in all but one case. The mean blood lead levels were significantly higher in those with (a) abnormally brisk deep reflexes and (b) with evidence of cerebellar dysfunction, than in those without these findings. Five optional treatment regimens were employed and a classification was used, based on clinical findings, initial blood lead levels and the response to the calcium disodium edetate mobilization test. This data suggested that neurological manifestations occur frequently in those abusing leaded gasoline and that chelation therapy has an important place in their management.

Shaw, J. R., Todd, N. W., Goodwin, M. H., & Feldman, C. M. (1981). Observations on the relation of environmental and behavioral factors to the occurrence of otitis media among Indian children. Public Health Reports, 96(4),342-349.

Studies were conducted to assess the relation of environmental and behavioral factors to the occurrence of acute suppurative otitis media (ASOM) among four populations of Indian children in Arizona. Episodes of ASOM were recorded for 1,428 children observed during the first year of life. Results did not indicate that any one environmental or behavioral factor observed was consistently or strongly associated with either the

incidence of ASOM or the frequency of attacks. Similarly, no differences were apparent in the frequency of adverse environmental conditions in homes of infants with contrasting rates of ASOM. Rates of ASOM during the first year of life were not associated with either the presence or the absence of adverse environmental conditions.

Shields, L. (Research in Progress). Study of the reproductive effects of paternal and maternal exposure to radioactive uranium waste (NAR-81-01). Window Rock, AZ: Indian Health Service, Navajo Area Office.

This article discussed the purpose of an on-going study which is attempting to determine whether a possible increase in birth defects is ocurring in Shiprock, New Mexico due to the mining and milling of uranium ore. Two research hypotheses will be investigated: (a) paternal occupational exposure to the uranium ore will be associated with an excessive risk of birth defects, and (b) parental residential exposure to radiation from mine waste of mill tailings will be associated with an excessive risk of birth anomalies. Exposure to the potential sources of radiation will be determined through review of attendance histories (occupational. residential, and school) of all subjects and cross checked with government records and reports.

Sievers, M. L. (1976). Diabetes mellitus in American Indians: Standards for diagnosis and management. Diabetes, 25(6), 528-531.

In most American Indian tribes the frequency of diabetes mellitus is much greater than among non-Indians and surveillance of health records has shown that many types of illnesses occur more often in diabetics than in nondiabetics. Guidelines have been developed for diabetes detection and treatment for purposes of limiting diabetes detection and treatment to persons with high probabilities of having the disease and concentrating diabetes case finding among high-risk groups or individuals. The guidelines emphasize that early diagnosis and careful management of diabetic pregnancies can decrease rates of macrosomia, congenital malformations, spontaneous abortion, stillbirth, and neonatal death. Diabetes management is based on staging criteria and requires trained paramedical

workers in many aspects of management of asymptomatic diabetics, while the physicians concentrate more extensively on diabetes with symptoms and remediable complications.

Spivey, G., & Hirschorn, N. (1977). A migrant study of adopted Apache children. Johns Hopkins Medical Journal, 140(2), 43-46.

Reservation born Apache children adopted into non-Apache homes off the reservation at an early age were studied for incidence of three illnesses common on the reservation--pneumonia, diarrhea, and otitis media. The illness rates were compared with those of non-Apache siblings in the adoptive home and with those of reservation children. Adopted Apache children had more illness than their non-Apache siblings, but less than Apache children on the reservation. Particularly striking was the low rate of multiple episodes of illness for adopted Apaches compared with those on the reservation.

Stewart, J. L. (1975). Provision of health care to underserved populations. Volta Review, 77(1), 64-71.

The author discussed efforts initiated in 1971 by the Indian Health Service to begin a four-fold program to combat the high incidence of otitis media among Native Americans. The program consisted of: (a) prevention; (b) case finding and treatment of acute disease in the age group under two years of age; (c) treatment of chronic disease and appropriate follow-up; and, (d) rehabilitation. Due to a shortage of trained professionals, a key component of the program was the preparation and utilization of indigenous paraprofessionals.

Stratton, R., & Stratton, R. (1984). Oklahoma Indians have lower cardiovascular and cancer mortality rates than Oklahoma Whites. Journal of the Oklahoma State Medical Association, 77(6), 183-185.

This article supported research which showed that Oklahoma Indians have low cardiovascular disease (CVD) and cancer rates compared to Oklahoma Whites. The authors reported that the lower rates for Indians could not be explained, as some have proposed, by the earlier deaths of some Indians due to cirrhosis of the liver. Further, there have not been

any scientifically controlled comparisons of Oklahoma Indians and Anglos for smoking, diet, exercise, hypertension or blood lipids. The authors concluded that research needs to be conducted to understand why Native Americans have a lower rate of cardiovascular and cancer mortality.

Tervo, R. C. (1983). The Native child with cerebral palsy at a children's rehabilitation centre. Canadian Journal of Public Health, 74(4), 242-245.

A total of 187 children with cerebral palsy (CP), 62 of whom were Canadian Natives, were reviewed. The mean age of referral for treatment was 2.8 years with no difference between the two groups. The Native child was more likely to have a history of central nervous system infection. The authors reported that: (a) Native children with CP were more functionally involved, came from larger families, had more difficulty standing, ambulating, feeding and toileting; and (b) these children were also more likely to have a history of seizures and delayed language. A suggestive relationship was observed between being a Native child with CP and vision or hearing deficits. It was recommended that services to the handicapped Native child and his family should be tailored in ways other than traditionally prescribed.

Todd, N. W., & Bowmank, C. A. (1985). Otitis media at Canyon Day, Arizona: A 16 year follow-up in Apache Indians. Archives of Otolaryngology, 111(9), 606-608.

A 16-year follow-up survey of Native Americans living in Canyon Day, Arizona, was conducted to determine if the rate of otitis media had dropped since prior studies. The authors reported no improvement in the previously documented rate of 9.3%. However, the manifestations were more benign, especially in children, and included the spectrum of otitis media. It was suggested that a genetically determined eustachian tube difference may explain the high rate of occurrence of otitis media in these Apache Indians. Improvements in living conditions and health care were considered an explanation of the currently less severe manifestations of otitis media.

Wiet, R. J., DeBlanc, G. B., Stewart, J., & Weider, D. J. (1980). Natural history of otitis media in the American Native. Annals of Otology, Rhinology and Laryingology, 89, 14-19.

The authors reported that prevalence of otitis media is more frequent in American Natives than in Caucasians or Blacks. This article attempted to: (a) delineate the factors that account for the high prevalence of otitis media in the acute and chronic form; and (b) evaluate the characteristic morbid complications of otiis media in the Native population.

Wong, S., Hughes, W., & Mah, J. (1978). Refractive and ocular problems in the Navajo population. Review of Optometry, 115(2), 30-35.

Student externs, working under the supervision of Indian Health Service optometrists, examined a clinical sample of Navajo Indians living in the Southwest. The externs examined 237 patients, referring 140 for optometric care, 65 for a combination of optometric and medical care, and 32 for medical evaluation. This paper described the experiences of these externs who worked with the optometrists in the Public Health Service Hospital at Tuba City, Arizona, and Shiprock, New Mexico. The two major goals of this paper were to: (a) describe the American Indian Health Project; and (b) to present the optometric results of the Project.

Young, T. K., Mcintyre, L. L., Dooley, J., & Rodriguez, J. (1985). Epidemiologic features of diabetes mellitus among Indians in northwestern Ontario and northeastern Manitoba. Canadian Medical Association Journal, 132(7), 793-797.

This descriptive epidemiologic study of diabetes mellitus among Indians in northwestern Ontario and northeastern Manitoba provided estimates of the prevalence of diagnosed cases: (a) 28/1000 overall; (b) 46/1000 for those aged 15 to 64 years of age; and (c) 96/1000 for those aged 65 years and older. Diabetes was more prevalent among women than men, but was rare in children. More than half of the existing cases had been diagnosed within the last 5 years (1978-1982). Comparisons with Canadians nationally and other North American Indian groups were made with caution due to the different

methods of case ascertainment. The authors found that duration of disease and pre-existing hypertension are statistically significant risk factors for the development of complications of diabetes in this population.

Zonis, R. D. (1968). Chronic otitis media in the southwestern American Indian (I: Prevalence). Archives of Otolaryngology, 88(4), 360-365.

This article dealt with chronic otitis media in a population of southwestern American Indians. Among the total number of patients seen, 81% were under the age of 25 years. A large number of adults had healed perforations. This implied that chronic otitis media can heal spontaneously without major recurrence in most patients. A study of 505 individuals, representing 93% of a representative population of southwestern Indians revealed an 8.3% prevalence of otitis media. The higher numbers in the younger age groups was due to the Indian community populations being comprised of individuals half of which are under 20. Few complications seemed to verify the benign nature of this condition in the southwestern Indian.

Zonis, R. D. (1970). Chronic otitis media in the Arizona Indian. Arizona Medicine, 27(6), 1-6.

This article discussed the high prevalence of otitis media among a southwestern Apache Indian population, and possible causes for the high incidence of this disease. It was hypothesized that cultural influences may contribute to the high incidence of otitis media. Other variables, such as allergies, climate, hygiene, and diet were ruled out as significant contributors to the disease. The author concluded that the incidence of otitis media among Indians could be lessened if treatment was sought as soon as symptoms appeared. The neglect of treatment seemed to be a result of isolation from facilities, cultural taboos, or other social problems beyond the control of the patient. Those Indians who were treated showed significant improvement.