Confronting Oral Health Disparities Among American Indian/Alaska Native Children: The Pediatric Oral Health Therapist

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American Indian and Alaska Native (AIAN) children are disproportionately affected by oral disease compared with the general population of American children. Additionally, AIAN children have limited access to professional oral health care. The Indian Health Service (IHS) and AIAN tribal leaders face a significant problem in ensuring care for the oral health of these children.

We discuss the development and deployment of a new allied oral health professional, a *pediatric oral health therapist.* This kind of practitioner can effectively extend the ability of dentists to provide for children not receiving care and help to confront the significant oral health disparities existing in AIAN children.

Resolving oral health disparities and ensuring access to oral health care for American Indians and Alaska Natives is a moral issue—one of social justice. (*Am J Public Health.* 2005; 95:1325–1329. doi:10.2105/AJPH.2005.061796.)

". . . of all the forms of inequality, injustice in health care is the most shocking and inhumane."

—Martin Luther King, Jr.

Dental caries is the most common form of chronic disease in childhood: by midchildhood more than 50% of children are affected, and by late adolescence 80% of children have experienced dental caries. The prevalence and severity of dental disease are linked to socioeconomic status across all age groups.[1,2] Dental caries disproportionately affects minority groups, particularly the American Indian/Alaska Native (AIAN) population.[3]

We outline the problem of dental disease and access to care for AIAN children; propose an alternative delivery system involving a new class of allied oral health professional, the *pediatric oral health therapist*; describe previous, failed attempts to pursue this alternative system in the United States; and report on the current efforts in Alaska to introduce the pediatric oral health therapist into the tribal health care system. We argue that solving the problem of dental disease and access to care for American Indians and Alaska Natives is a moral issue—one of social justice.

DEFINING THE PROBLEM

The AIAN population has the highest tooth decay rate of any population cohort in the United States: 5 times the US average for children 2–4 years of age. Seventy-nine percent of AIAN children, aged 2–5 years, have tooth decay, with 60% of these children having severe early childhood caries (baby bottle tooth decay). Eighty-seven percent of these children, aged 6–14 years, have a history of decay—twice the rate of dental caries experienced by the general population. Ninety-one percent of AIAN young people, aged 15–19 years, have caries. In general, 68% of AIAN children have untreated dental caries. One-third of school children report missing school because of dental pain, and 25% report avoiding laughing or smiling because of the way their teeth look.[3] This prevalence of caries infection exists in spite of the implementation of significant dental decay prevention programs by the IHS and tribes, including fluoridation of water systems suitable for fluoridation, the use of topical fluorides and dental sealants, and educational programs on oral health for children and parents.

Lack of access to professional dental care is a significant contributor to the disparities in oral health that exist in the AIAN population. Two major factors contribute to inadequate access to care: the relative geographic isolation of tribal populations, particularly in Alaska; and the inability to attract dentists to practice in IHS or tribal health facilities in rural areas.

Alaska offers a specific example of a geography-related barrier to providing access to care. There are 120 000 Alaska Natives in the state, with approximately 85 000 of these individuals living in the 200 villages that make up rural Alaska. A majority of these villages are not connected to the rest of the state by roads, thus requiring travel by air or water. Although village clinics provide essential medical care, in many instances villagers must travel hundreds of miles by bush-plane or boat to obtain dental care.

Despite intense recruitment efforts and significant financial incentives, the IHS and the tribes continue to experience great difficulty in attracting dentists. Approximately one-fourth of the dentist positions at 269 IHS and tribal health facilities were vacant in 2000.[4] Historically, Alaska's tribal programs have had a 25% vacancy rate for dentists and a 30% average annual turnover rate. (J. Tucker, DDS, oral communication). There is 1 dentist for every 2800 individuals in the IHS and tribal health clinics, compared with 1 dentist for every 1500 individuals in the general population.[3] The lack of dentists of AIAN ethnicity is a contributing factor to the access problem. There are only 85

AIAN dentists in the United States (1 for every 35 000 AIAN individuals); 70 of these are employed by the IHS or a tribe.[5]

EXPANDING THE ORAL HEALTH CARE TEAM

The potential to reach more AIAN children in need of oral health care can be significantly improved by expanding the number of individuals capable of providing care. Although physician's assistants and nurse practitioners are commonly employed as "physician extenders" (providers licensed to practice under the direction of a supervising practitioner), the only comparable "dentist extender" is the dental hygienist, who deals primarily with issues of periodontal health for adults and generally is able to work only under direct supervision of a dentist. In 1995, an American Dental Association (ADA) task force recommended a significant expansion of the dental team in order to meet the emerging crisis in the workforce.[6] Recently, the editor of the *Journal of the American Dental Association* called for an expansion of allied dental personnel and their duties as the preferable alternative to increasing the number of dentists being educated in our dental schools.[7] Several leaders in dental practice and education have echoed his call. [8,9]

The New Zealand school dental nurse, now called a dental therapist, has served as a prototype for adding such a member to the dental team in many countries throughout the world. School dental nurses have provided comprehensive primary care for children in the schools of New Zealand since 1921. The World Health Organization documents 42 countries with some variant of a dental therapist.[10] The typical justification for developing and deploying dental therapists in these countries has been an inadequacy of the dental workforce, adversely affecting access to oral health care.[11]

NEW ZEALAND'S MODEL

The training curriculum for New Zealand dental therapists consists of 2 academic years, both of which are 32 weeks in duration, with a total of 2400 curriculum clock hours. Approximately 760 hours of the curriculum are spent in the clinical setting treating children. Upon graduation, individuals enter the School Dental Service and must serve for 1 year with another school dental therapist.

School dental nurses/therapists in New Zealand have transformed the oral health of the children of the country and laid the basis for what was to become an international movement.[12] New Zealand's School Dental Service has developed an outstanding record in caring for the oral health of all children in New Zealand. Dental therapists provide a full range of care for children in school-based clinics, including preventive therapy, restoration of teeth with fillings and stainless steel crowns, pulp therapy, and extraction of primary teeth. In 1998, there were 569 dental therapists in the School Dental Service caring for 497 000 school children in over 2000 schools.[13] All children, aged 6 months through 13 years, are eligible to participate in the School Dental Service and receive comprehensive preventive and restorative care, without fee, at their local school clinic from the school dental therapist. Although enrollment is not compulsory, 97% of all school-age children participate in the School Dental Service.[14]

Although the indices of decayed, missing or extracted, and filled (primary and permanent) teeth (deft/DMFT) of the children of New Zealand and the United States is roughly comparable, there are differences in the components of these epidemiological measures. A 2003 report[15] indicate that 53% of New Zealand's children of 5 years of age are caries free, and the cohort has a mean rate of extracted/filled primary teeth (eft) of 1.8. At ages 12–13 years, 42% of children are free of caries, with a mean missing/filled permanent teeth (MFT) of 1.6. These data are interesting in that the decayed (d/D) components are not included, because these data are collected at the end of each school year and represent children enrolled in the School Dental Service whose decayed teeth, at that time, have either been restored or extracted, or have exfoliated. This means that essentially all of the school children in New Zealand are free of untreated caries at the end of an academic year.

In 1968, at the Centennial Conference on Oral Health held at the Harvard School of Dental Medicine, Dr John Walsh of the University of Otago (New Zealand) School of Dentistry suggested the use of a *care index,* which can be calculated by developing a ratio of the filled-teeth component (f/F) of the deft or the DMFT to the overall deft or DMFT, thus yielding a percentage of the teeth requiring treatment for which restoration had been provided.[16,17] In 1968, the care index in New Zealand was 72%, meaning that 72% of all teeth of children affected by caries had been restored. In the United States, the figure was 23%. Walsh made the claim that the care index provides a convenient measure of the effectiveness of a country in treating dental caries. Today, the care index for New Zealand children is essentially 100%.[18] In the United States, although significantly improved from 1968, it is 63.3% for primary teeth and 74.0% for permanent teeth through age 14.[19] Of note is the fact that the care index drops significantly for US children when adjusted for family income. For primary teeth, it is 72.3% for children at 300% of the federal poverty level (FPL) but only 48.7% for children at 100% of the FPL. For permanent teeth, it is 93.2% for children at 300% of the FPL and only 72.3% for children at 100% of the FPL.[19] The care index for AIAN children, aged 2–5 years, is 34.9%.[3]

HEALTH CANADA'S UTILIZATION OF THERAPISTS

Health Canada (the Canadian Ministry of Health) adopted the New Zealand model of dental nurses/therapists and has trained and utilized dental therapists to provide access to dental care for "First Nation" Canadians since 1972.[20] The National School of Dental Therapy for Canada exists as a component of the First Nations University of Canada, in Prince Albert, Saskatchewan. The school's mission is to train dental therapists, in a 2-year program, to provide care for the remote villagers of the Canadian North (Schnell GM, DDS, unpublished data). The curriculum is modeled after New Zealand's program. Dental therapists are able to work for Health Canada on federal First Nation reserves

throughout Canada, with the exception of the provinces of Ontario and Quebec. There are approximately 90 dental therapists so employed today.[21]

With the advent of the use of therapists in Canada on First Nation reserves, the ratio of extractions to restorations dropped significantly, from over 50 extractions per 100 restorations in 1974 to fewer than 10 extractions per 100 restorations in 1986.[22] New Zealand experienced a similar circumstance with the introduction of school dental nurses/therapists, with a decline of 75 extractions per 100 restorations when the program first began in the mid-1920s to 7.5 per 100 in 1945 and 3.6 per 100 in 1964.[23]

Double-blind studies of the work of the Canadian dental therapists, in comparison to federally employed Canadian dentists, have been conducted (Schnell GM, DDS, unpublished data).[24] The results indicated the quality of restorations placed by dental therapists was equal to those placed by dentists.

THE UNITED STATES EXPERIENCE

In 1949, Massachusetts passed legislation authorizing the Forsyth Dental Infirmary for Children (Boston) to accept funding from the US Children's Bureau to initiate a research project to train individuals, in a 2-year program, to prepare and restore cavities in children's teeth.[25,26] The passage of this legislation provided for the establishment of an experimental dental care program for children similar to the school dental nurse program of New Zealand. The American Dental Association (ADA) swiftly passed resolutions "deploring" the program, expressing the view that any such program concerning the development of "sub-level" personnel, whether for experimental purposes or otherwise, should be planned and developed only with the knowledge, consent, and cooperation of organized dentistry. The position of the ADA was that a teaching program designed to equip and train personnel to treat children's teeth cannot be given in a less rigorous course, or in a shorter time, than that approved for the education of dentists.[26] Faced with increasing pressure from organized dentistry, the Massachusetts governor signed a bill in July 1950, rescinding the enabling legislation.[27]

In 1970, the House of Delegates of the Massachusetts Dental Association passed a resolution favoring research on expanded-function dental auxiliaries. As a result, the Forsyth Dental Center launched a research project to train dental hygienists in anesthesia and restorative therapy for children. However, in 1973, the Board of Dental Examiners voted unanimously that the drilling of teeth by hygienists was a direct violation of the dental practice act of Massachusetts and forced the Forsyth Dental Center to end its experiment, but not before investigators were able to document that hygienists could be taught to efficiently provide quality restorative dental care for children in a cost-benefit–effective manner.[28]

In 1972, the University of Southern California School of Dentistry proposed employing school dental nurses, like those in New Zealand, to help solve the problem of dental caries in school children.[29] This proposition prompted the California Dental Association to establish a committee to study the New Zealand dental care system.[30,31] Their report stated that "there is little doubt that dental treatment needs related to caries for most of the New Zealand children aged 2 to 15 years have been met." However, the report concluded that the California public would "probably not" accept the New Zealand type of school dental service, as it would be perceived as a "second-class system." A number of individuals wrote sharp rebukes to the committee's report, pointing out the inconsistencies of the objective findings of the investigation in relation to the subjective conclusions of the report, which they judged to be drawn to placate the practicing profession in California.[32,33–35]

Between 1972 and 1974, at the University of Kentucky, another expanded-functions project, supported by the Robert Wood Johnson Foundation, took place (Spohn EE, DDS, unpublished report). The project also involved the training of dental hygienists in restorative dentistry for children. Thirty-six students, who were completing a 4-year baccalaureate program in dental hygiene, participated in a compressed curriculum that provided 200 hours of didactic instruction in children's dentistry, as well as 150 hours of clinical practice. The program was specifically designed to provide primary care for children, including administration of local anesthesia, restoration of teeth with amalgams and stainless steel crowns, and pulp therapy. A double-blind study found no significant differences between the quality of the hygienists' work and that of the graduating student dentists (Spohn et al., unpublished report).

At the College of Dentistry at the University of Iowa, a 5-year project, conducted from 1971 to 1976, and supported by the W.K. Kellogg Foundation, trained dental hygienists to perform expanded functions in restorative dentistry and periodontal therapy for both children and adults.[36] The results were the same as those of the studies at the Forsyth Dental Center and the University of Kentucky. Hygienists could be effectively trained, in a relatively brief time period, to perform, at a comparable level of quality, procedures traditionally reserved for dentists.

A curriculum to develop dental therapists, more recently designated "pediatric oral health therapists,"[37] exists and has been documented to be effective in multiple countries throughout the world. It is the traditional curriculum of the New Zealand school dental nurse/therapist. The curriculum for a pediatric oral health therapist would be comparable to the 2-year (associate's degree) curriculum for preparing dental hygienists. The primary difference would be the focus of the training: the hygienist's focus would be periodontal disease, particularly in the adult; the therapist's focus would be dental caries, specifically in the child. Evidence suggests the performance skills required to restore children's teeth are no more complex than those skills typically taught to dental hygienists in a 2-year curriculum (Spohn EE, DDS, unpublished report).[28,36]

DEPLOYING THERAPISTS IN ALASKA

In 2001, the Forsyth Institute approached the Robert Wood Johnson Foundation for funding to develop a training program for

pediatric oral health therapists.[38] Funding was not forthcoming. Absent the availability of a program for training therapists in the United States, the Alaska Native Tribal Health Consortium proceeded, in 2003, to send 6 Alaskan students to the University of Otago in New Zealand to train as therapists; 6 additional Alaskan students enrolled in the training program in January of 2004.

The first group of therapists returned to Alaska from New Zealand in December of 2004 to provide oral health care in the context of the Community Health Aide (CHA) program, a program authorized by federal statute, in which tribes provide primary health care throughout Alaska. The program has been in existence for 36 years. There are over 500 CHAs in Alaska, working in 180 villages, providing culturally sensitive health care to fellow villagers. A component of the CHA Program is the dental health aide (DHA). There are 3 levels of functioning for DHAs: DHA I and DHA II, and the third and highest level, the DHA therapist, a responsibility to be assumed by the pediatric oral health therapists who have recently returned to Alaska from New Zealand. CHAs, including DHAs, must meet specified training requirements, undergo a protracted preceptorship, and have their skills reevaluated every 2 years. Continuing education is required for continued certification. CHAs and DHAs are recruited from villages that they will return to serve. This practice ensures culturally competent care, as well as sustainable jobs in areas that need them most.

The ADA was informed of the Alaskan students studying dental therapy in New Zealand and the intent for them to return to tribal programs to practice. At the October 2003 annual session, the ADA House of Delegates passed a resolution calling for a task force to "explore options for delivering high quality oral health care to Alaska Natives."[39] The Alaska Native Oral Health Access Task Force submitted its report to the ADA Board of Trustees in August 2004. On the basis of the task force's recommendations, the board, at the ADA's October 2004 Annual Session, advanced to the House of Delegates a resolution with 14 elements to address access to oral health care for Alaska natives. Two of the elements dealt specifically with the advanced-level DHA therapist (pediatric oral health therapist): (1) "the ADA work with the ADS (Alaska Dental Society) and tribal leaders to seek federal funding with the goal of placing a dental health aide (i.e., a Dental Health Aide I or II) trained to provide oral health education, preventive services and palliative services (*except irreversible procedures such as tooth extractions, cavity and stainless steel crown preparations and pulpotomies* [emphasis added]) in every Alaska Native village that requests an aide"; and (2) "The ADA is opposed to non-dentists making diagnoses or performing irreversible procedures." The resolution passed the House of Delegates overwhelmingly on a voice vote.[40]

Subsequently, the ADA initiated an effort to amend the Indian Health Care Improvement Act, which was in the process of being reauthorized by the Congress in the closing days of the 108th Congress. This act authorizes development and operation of the CHA Program, which includes dental health aides. House Bill HR 2440 was amended at markup to read "ensure that no dental health aide is certified under the program to perform treatment of dental caries, pulpotomies, or extractions of teeth."[41] However, the ADA's amendment was not successful, as reauthorization of the Indian Health Care Improvement Act was not accomplished by the 108th Congress; reauthorizing legislation will have to be re-introduced in the 109th Congress. It is clear that organized dentistry's opposition to developing a new member of the dental team to provide primary oral health care for underserved children has not changed since the first attempt to train dental nurses at the Forsyth Dental Infirmary in 1949.

SOCIAL JUSTICE

Kopleman and Palumbo have published a thoughtful and compelling article in the *American Journal of Law and Medicine* entitled: "The US Health Delivery System: Inefficient and Unfair to Children."[42] The article explores the 4 major ethical theories of social or distributive justice: utilitarianism, egalitarianism, libertarianism, and contractarianism. They conclude that no matter which theoretical stance is taken, children should receive priority consideration in receiving health care. Yet, AIAN children (as well as poor and minority children throughout America) do not receive equal, much less priority, consideration.

In his *A Theory of Justice*, one of the most important and influential books of political philosophy written in the 20th century, the late John Rawls of Harvard University carefully explicated a model of justice in which social and economic arrangements would be such as to maximally benefit the least advantaged.[43] Given a Rawlsian view of social justice, our nation's oral health care system, if it is to be just, must be committed to maximally benefiting the least advantaged. AIAN children and other children of socioeconomic and racial/ethnic minority groups have a higher prevalence of oral disease and disproportionately experience oral health access problems compared to nonminority children and those in higher socioeconomic groups. Norman Daniels, Professor of Bioethics and Population Health at the Harvard School of Public Health, agreed with Rawls and argued that a just society should provide basic health care to all but that health care should be redistributed more favorably to children.[44] He justified his conclusion based on the effect health care has on equality of opportunity for children, with equality of opportunity being a fundamental requirement of justice.

The time has come for American public health leaders to openly and forthrightly support the implementation of the pediatric oral health therapist's program in Alaska. It is also incumbent on the American public health community to courageously challenge the existing barriers to developing and deploying pediatric oral health therapists as members of the dental team in the remainder of the United States. Doing so will help ensure that our disadvantaged and underserved children are treated justly by society by having access to basic, primary oral health care and by having an opportunity for good oral health equal to that of other children. ■

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D.A. Nash conducted the research on the history and international utilization of dental therapists. R. Nagel served as the resource person for the Alaska project. Both participated in writing the article.

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