

Adding Dental Therapists to the Health Care Team to Improve Access to Oral Health Care for Children

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Oral Health in America: A Report of the Surgeon General, and the subsequent *National Call to Action to Promote Oral Health*, contributed significantly to raising awareness regarding the lack of access to oral health care by many Americans, especially minority and low-income populations, with resulting disparities in oral health. The problem is particularly acute among children.

The current dental workforce in the United States is inadequate to meet the oral health care needs of children. It is inadequate in terms of numbers of dentists, as well as their geographic distribution, ethnicity, education, and practice orientation. Dental therapists, paraprofessionals trained in a 2 academic-year program of postsecondary education, have been employed internationally to improve access to oral health care for children. Research has

documented that utilizing dental therapists is a cost-effective method of providing quality oral health care for children. Dental therapists have recently been introduced in Alaska by the Alaska Native Tribal Health Consortium. Dental therapists could potentially care for children in dental offices, public health clinics, and school systems, as well as in the offices of pediatricians and family physicians. Adding dental therapists to the health care team would be a significant strategy for improving access to care for children and reducing oral health disparities.

KEY WORDS: access to care; disparities; dental therapist; oral health

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Oral Health in America: A Report of the Surgeon General (SGROH), and the subsequent *National Call to Action to Promote Oral Health*, under the leadership of the Office of the Surgeon General, contributed significantly to raising awareness regarding the lack of access to dental care for many Americans, with the resultant existence of significant disparities in oral health.^{1,2} This article was prepared as a component of the American Academy of Pediatrics' review of progress in access to care and improving children's oral health since the Surgeon General's Report. Nash and Nagel³ have reported that the vision for introducing the international model of dental therapists in the United States to care for children was a direct result of the SGROH.

Although SGROH addressed the issue of oral health for all Americans, this article will focus on the issue as related to children as follows: 1) identify workforce barriers that exist in providing access to oral health care for children, 2) characterize international approaches to improving access to care for children, 3) suggest that current approaches to care are not cost effective, 4) review the recent effort to introduce dental therapists in the United States, 5) identify a training strategy for dental therapists, and 6) suggest practice settings for dental therapists, including in the offices of pediatricians and family physicians.

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WORKFORCE BARRIERS TO ACCESSING ORAL HEALTH CARE FOR CHILDREN

Multiple barriers have been identified in ensuring access to care for children.^{1,2,4–6} Significant among these barriers is the professional dental workforce—inadequacy in the number of dentists, as well as their geographic distribution, ethnicity, education, and practice orientations.

There are approximately 130 000 actively practicing general dentists in the United States.⁷ The dentist to population ratio is declining from its peak of 59.5/100 000 in 1991 and will drop from the current 58/100 000 to 52.7/100 000 in the year 2020.⁸ Beginning in 2008, more dentists will retire than graduate; this trend will continue until 2020.⁹ Although the number of pediatric dentists has increased significantly over the past 30 years, the specialty organization, the American Academy of Pediatric Dentistry, has only 4861 active members.¹⁰ In 2000, the president of the American Academy of Pediatric Dentistry stated: “. . . even with a Herculean increase in training positions [for pediatric dentists], improved workforce distribution, and better reimbursement and management of public programs, pediatric dentistry [the specialty] will never be able to solve this national problem [of disparities] alone. We need help.”¹¹

Compounding the issue of numbers of dentists is the location of dental practices. The overwhelming majority of dentists practice in suburbia, with few practicing in rural and inner city areas where children with the greatest need live. The number of federally designated dental health professional shortage areas increased from 792 in 1993 to 4091 in 2009.^{12,13}

The ethnicity of oral health professionals contributes to the access problem. Ethnic populations prefer health professionals of the same ethnicity, and minority health

professionals provide more care for the underserved.^{14,15} Although approximately 12% of the population is African American, only 2.2% of dentists are. Hispanics are another 10.7% of the population, yet only 2.8% of dentists are Hispanic.¹⁶ Less than 6% of entering student dentists are African American and less than 6% are Hispanic.¹⁷ The demographics of oral disease suggest that poor access to care among these 2 minority groups contributes significantly to the overall disparities in oral health among America's children.¹⁸

A further issue is the general lack of instruction and experience that graduating dentists have had treating children. The typical college of dentistry curriculum provides an average of only 177 clock hours of didactic and clinical instruction in dentistry for children.¹⁹ A recent study entitled "US Predoctoral Education: Its Impact on Access to Care," found that 33% of dental school graduates had not had any actual clinical experience in performing pulpotomies and preparing and placing stainless steel crowns, common therapies required for treating dental caries in children.²⁰ The authors concluded "results suggest that US pediatric dentistry predoctoral programs have faculty and patient pool limitations that affect competency achievement, and adversely affect training and practice."²⁰ General dentists are not likely to practice what they have not been taught, or in which they have not developed competencies, during their dental education.

The practice orientation of many dentists is a barrier to access. Dentists generally do not treat publicly insured children, children covered by Medicaid, or the Children's Health Insurance Program (CHIP). A 2001 study found that approximately 25% of dentists received some payment from Medicaid during a given year; however, only 9.5% received \$10 000 or more.²¹ As a result of the recent expansion of CHIP, 40 million of America's 78.6 million children—the majority—are now covered by Medicaid and CHIP,²² and these are the children in whom the overwhelming percentage of dental disease exists.¹⁸ Yet, less than 10% of dentists participate to any significant degree in caring for these children. A 2004 report indicated that only 45% of California's pediatric dentists participated in the state's Medicaid program.²³ A recent national survey of board-certified pediatric dentists reported 53.2% of private practicing pediatric dentists accepted Medicaid reimbursement.²⁴ These statistics document the significant problem of access to care for children from low-income families.

AN INTERNATIONAL APPROACH FOR IMPROVING ACCESS TO CARE FOR CHILDREN

In 1921, New Zealand developed a 2 academic year program to train high school graduates to become school dental nurses.²⁵ These school dental nurses were then assigned to school-based dental clinics, which subsequently came to exist in all of the elementary schools of New Zealand.^{26,27} Today, there are over 600 dental therapists (the name changed in the 1980s) caring for the country's 850 000 children.²⁸ Ninety-seven percent of New Zealand's children are cared for by dental therapists who

are assigned to every elementary and middle school in New Zealand.²⁹ They work under the general supervision of a district dental officer. A recent report of the oral health of New Zealand's school children documented that at the end of a given school year, essentially none of New Zealand's children in the School Dental Service had untreated tooth decay.³⁰

The model developed in New Zealand has spread to 52 other countries.²⁸ Australia has over 1500 practicing dental therapists, with 88% working in the School Dental Service.²⁸ Malaysia employs dental therapists to provide publicly financed dental care for its 3 million children through a network of 2000 public dental clinics. Dental therapists provide essentially all dental care for children in Malaysia.²⁸ Three hundred dental therapists have practiced with Health Canada, Canada's Ministry of Health, since 1972³¹ (Schnell GM unpublished report, 2003), and approximately 100 are employed by Health Canada to treat Canada's First Nation people (White L, personal communication, March 2007).³² The remainder practice in Saskatchewan in dental offices, complementing the work of dentists in much the same manner dental hygienists practice in the United States. There are 700 dental therapists practicing in the United Kingdom in a variety of oral health care settings.³³ Great Britain recently expanded the training opportunities for dental therapists and now graduates over 200 dental therapists each year from its 15 programs.^{34,35} Historically, practices of dental therapists internationally have been limited to children. Only recently have some jurisdictions begun to permit selected procedures to be performed on adults in specific circumstances. The research regarding dental therapists on quality, access, effectiveness, and costs, as identified elsewhere in this article, has been in relation to children, not adults.

Throughout the world, the use of dental therapists to provide primary care for children is growing in popularity, primarily because the dental workforce is unable to provide access to basic oral health care, particularly for children. International studies and experience, as well as research in the United States, have documented that the quality of care dental therapists provide children—in terms of diagnostic, preventive, and technical skills—is comparable to that of general dentists.^{25,36-46}

THE ECONOMIC ISSUE

Developing and deploying dental therapists for children is rational economics. General dentists are trained in complex diagnostic and rehabilitative procedures for all patients; pediatric dentists are trained in primary care for children, but also in tertiary care—the ability to care for children with complex developmental and medical problems—as well as how to manage children who either lack cooperative ability or are uncooperative in their behavior. General dentists' average earnings for 2006 were \$202 190, and pediatric dentists' were \$337 810.⁷ In New Zealand, dental therapists with 2 years of postsecondary education treat essentially all of the nation's children and earn, on average, US \$40 000/year (Kardos TB,

personal communication, June 2008). It is questionable as to whether the typical child requires the level of expertise of a dentist/pediatric dentist in receiving primary preventive and basic restorative care.

The division of labor principle of organizational management science suggests that procedures should be delegated to the least trained and lowest salaried individual in an organization who is able to perform the activity effectively and competently at the required level of quality.⁴⁷ Applying this principle to the dental workforce suggests that primary preventive and basic restorative procedures for children should be assigned to a dental therapist, resulting in a more economical expenditure of resources. This is particularly relevant with regard to care paid by Medicaid/CHIP, given significantly constrained public monies and the inability of public insurance to reimburse practitioners at the rate of their usual and customary fees. As indicated, the majority of America's children are now covered by public insurance. If dental therapists practiced in the United States, general dentists and pediatric dentists would serve as providers of secondary and tertiary care for children, as is the case in New Zealand and Australia, and would focus on problems that only a dentist is trained to manage.

INTRODUCING DENTAL THERAPISTS IN THE UNITED STATES

Because of the prevalence of severe dental disease among Alaska Native children and the chronic shortage of dentists in Alaska, the Alaska Native Tribal Health Consortium, in 2003, with the support of the Indian Health Service, sent 6 Alaskans to be trained as dental therapists at the University of Otago, Dunedin, New Zealand's national dental school.^{3,48} They returned to Alaska in 2005 to begin caring for patients, primarily children, in rural villages, and were sued by the American Dental Association to stop what the Association considered to be the illegal practice of dentistry.⁴⁹ The Alaska attorney general's office subsequently ruled that dental therapists in the Alaska tribal health system are not subject to the state dental practice act because they are certified under federal law.⁵⁰ An independent assessment of the quality of care provided by the first cohort of Alaskan dental therapists returning from New Zealand concluded that they met every standard of care evaluated and were "competent providers."⁵¹ Subsequent research of the competency of the Alaskan dental therapists concluded: "No significant evidence was found to indicate that irreversible dental treatment provided by DHATs [dental therapists] differs from similar treatment provided by dentists."⁵² The lawsuit brought by the American Dental Association was settled in 2007.^{53,54} Currently, 11 dental therapists who were trained in New Zealand are practicing in Alaska.²⁸ Training of dental therapists has been initiated in Alaska in a program in cooperation with the physician's assistant program of the School of Medicine at the University of Washington, Seattle, Washington.⁵⁵ The American Association of Public Health Dentistry and the American Public Health Association have endorsed the practice of dental therapists in Alaska.^{56,57}

A major objection to the introduction of dental therapists to the United States is the belief that dental therapists are not adequately trained to care for children.⁵⁸ However, the results are uniform in finding that dental therapists provide an equivalent quality of care to dentists.³⁶⁻⁴⁶ The typical 2 year dental therapy curriculum internationally is 2400 clock hours—2 academic years.²⁸ Traditionally, dental therapists have only provided care for children, so curriculum time is devoted specifically to learning to care for children. In New Zealand, 760 of these hours are spent in the clinic caring for children (Tane H, personal communication, May 2003). As indicated previously, the most recent study of the curriculum hours in our nation's dental schools indicates that an average of only 177 hours is spent teaching general dentists to care for children; this includes classroom and clinic. At least from the perspective of the instructional curriculum, dental therapists receive more technical training and experience in treating children than do general dentists.

Developing Dental Therapists

Various models are possible for developing dental therapists to treat children in the United States. The classical model in the world has been a 2-year training program similar to current 2-year dental hygiene training programs in the United States. However, the leadership of dental education in Australia, New Zealand, and Great Britain have concluded that integrating the curricula for training dental hygienists and dental therapists results in a more versatile member of the health care team and is more economical than maintaining separate programs. They have now integrated their previously independent 2-year therapy and hygiene programs into a 3-year program, with resulting credentialing in both fields of practice.

Much of the curriculum of the current dental hygiene programs in the United States is inclusive of the biomedical and dental courses of traditional international dental therapists' programs. Few additional competencies would need to be added to the hygienists' curriculum to qualify a dental hygienist to provide the services traditionally provided by dental therapists for children. Research in the United States in the 1970s at the Forsyth Institute, the University of Kentucky, and the University of Iowa has demonstrated that dental hygienists can be trained within 1 additional academic year and potentially less than one year to provide basic, primary care for children.^{59,60}

It would be possible to develop an integrated, but modular, curriculum of 3 years, in which the first year is shared by both hygienists and therapists, with individuals tracking to either dental therapy or dental hygiene in the second year. Upon completing the 2-year curriculum, they could gain licensure in their respective field. Individuals wanting to be dually qualified could, in a third year, cycle through the second year curriculum in which they had not previously participated.

The following advantages of such an integrated, modular model could be realized:

1. Accessibility. The curriculum could be offered in the over 250 associate degree dental hygiene programs that exist

- in community and technical colleges in every state, thus permitting ready access to potential students.⁶¹
2. Flexibility. Individuals could choose to become hygienists or therapists, or both. This approach would also facilitate graduated hygienists returning to training for 1 year to gain qualification in the competencies associated with dental therapy. Such an opportunity would help address an issue that has been in the forefront of dental hygiene for some time, enriching professional life with new skills.
 3. Economics. Integrated training could utilize existing faculty, programs, and facilities, thus minimizing expensive duplication.
 4. Rapid and ready implementation. A therapist's curriculum based on the international model could be developed expeditiously, and with faculty and facilities already in place, could result in therapists being ready to help address the access problem for children in a relatively brief period.

Practice Settings for Dental Therapists

Children should be engaged in environments in which they normally function if the access problem is to be ideally addressed. New Zealand, from the beginning of its development of the concept of a dental nurse/therapist, identified the school system as the best place to serve children. New Zealand established dental clinics in its schools where school dental therapists effectively care for school-age children as well as infants, toddlers, and preschool children in the neighborhood.

The New Zealand school dental therapist who is assigned to a neighborhood school functions as what has been recently identified in the United States as a "dental home." In 2002, the concept of the dental home was introduced in the dental literature.⁶² The dental home is based on the American Academy of Pediatrics' "medical home." Among the characteristics of both is that care for children is accessible, coordinated, and continuous. The American Academy of Pediatric Dentistry's definition of a dental home states: "The dental home is the ongoing relationship between the dentist and the patient, inclusive of all aspects of oral health care delivered in a comprehensive, continuously accessible, coordinated, and family-centered way. Establishment of a dental home begins no later than 12 months of age and includes referral to dental specialist when appropriate."⁶³ It is difficult to envision a dental home being provided to all of America's children, and by 12 months of age, considering the identified current workforce limitations associated with general dentists and pediatric dentists. However, with the significant problem of early childhood caries, it is important that parents receive anticipatory guidance and preventive care early in a child's life—as the dental home definition states—by age 1 year.

The New Zealand School Dental Service cares for over 97% of all elementary school children and 56% of its preschool children, because care is brought to them in their neighborhood schools.⁶⁴ School-based dental therapists in

Australia provide the overwhelming majority of care for children in Australia.⁶⁵

However, school-based health care is not the norm in the United States. The offices of the nation's 57 000 pediatricians and over 60 000 family physicians currently serve as medical homes for the overwhelming majority of America's children.^{66,67} Increasingly, oral health is understood as a vital component of general health and well-being. Physicians could expand their function to provide a "health home" for children that includes oral health. The typical infant/child has had 12 visits to the pediatrician/family practice physician by age 3, providing multiple opportunities for anticipatory guidance as well as early intervention to effect primary preventive and basic restorative oral health care.^{68,69} Sixty percent of children's visits to the physician are in pediatricians' offices and approximately 20% in the offices of family physicians.⁷⁰ These primary care physicians could expand their scope of practice and retain dental therapists to work in their offices under their supervision. The medical and dental practice acts in a number of states would permit them to do so.

In 2003, the Public Health Practice Office of the Centers for Disease Control funded a study of the dental practice acts of all 50 states and the District of Columbia to determine the limitations the individual state practice acts place on individuals other than licensed dentists to provide oral health care.⁷¹ The results of the study suggest there would be no restrictions on physicians, such as pediatricians and family practice physicians, providing dental care in 23 states, and no restrictions in an additional 11 states as long as dentistry was not practiced as a specialty. In 9 states, physicians would only be allowed to provide emergency care. Three additional state practice acts seemed to suggest physicians would be restricted from providing any oral health services.

It is interesting to speculate what could occur if pediatricians and/or family practice physicians were to retain internationally trained dental therapists and began to offer primary oral health care for children in their offices. Such would seem to be permissible in 23 states, and possibly in as many as 34, depending on how "not practicing dentistry as a specialty" is interpreted. Certainly there are economic incentives for doing so. In 2006, the average general pediatrician earned \$188 496/year,⁷² and a family physician earned \$161 000/year.⁶⁷ As indicated previously, the average pediatric dentist had a net income of \$337 810 in 2006. Such a discrepancy in income is related to the number of technical procedures that are reimbursable to pediatric dentists, many of which a dental therapist could perform.

Pediatricians and family physicians are now receiving training in oral health care in a number of settings around the country and are conducting oral exams and applying fluoride varnish to children's teeth, for which they are being remunerated.⁷³ Oral health is a strategic priority for the American Academy of Pediatrics,⁶⁶ their Oral Health Initiative has a significant training program for pediatricians and other child health professionals at its

Web site (<http://www.aap.org/oralhealth/cme>). The Society of Teachers of Family Medicine Group on Oral Health has developed a national oral health curriculum, Smiles for Life, for educating family physicians (<http://www.smilesforlife2.org>).

Although a physician would typically not have the expertise in dentistry to “supervise” specific dental procedures, it should be noted that dental therapists caring for children in other countries, such as New Zealand and Australia, do not practice with direct supervision of a dentist. A physician-led “health home” could refer to dentists those children whose care exceeded the competencies and scope of practice of a dental therapist. It should be anticipated that integrating primary prevention and basic restorative dental care for children in the offices of pediatricians and family physicians using dental therapists would be met with significant opposition by the dental practice community. However, were such a delivery system in place, most infants/children could have access to care to address the problem of early childhood caries and help ensure a head start to good oral health.

In the more traditional delivery system, dental therapists would be in demand in dental practices as dental hygienists are today. Adding a therapist to the health care team could result in an increase in the number of dentists providing care for children, as well as expand the capacity for dentists already caring for children to see more children. Most dentists do not accept in their practices children whose care is publicly insured, ostensibly due to the inability to manage the costs of care given overhead considerations and the lower reimbursement schedule. Dental therapists could help mitigate this issue, as care could potentially be provided in a more cost-effective manner. Therapists could also practice in the public sector in public health clinics, federally qualified community health centers, and with not-for-profit organizations. However, state dental practice acts and regulations would have to be revised for dental therapists to practice in any of these settings.

Conclusion

America’s children have inadequate access to oral health care. Children from low-income and minority families experience more oral disease and receive less care. The current dental workforce is inadequate in numbers, composition, geographic location, education, and orientation to address this problem. Other countries in the world have utilized paraprofessionals, dental therapists, trained in 2-year programs of postsecondary education, to provide primary preventive and basic restorative care for children. The care provided by dental therapists has been documented to be equivalent in quality to that of dentists and is more economical. Developing dental therapists is a significant strategy to improve access to care for America’s children and reduce oral health disparities. Dental therapists practicing in the offices of pediatricians and family physicians could offer the advantage of helping ensure access to oral health care from infancy for the majority of America’s children.

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