

Role of Pediatric Nurse Practitioners in Oral Health Care

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Dental caries remain the most prevalent unmet health need in US children. Access to care is particularly problematic for poor children and is compounded by the shortage of dentists to meet the needs of this patient population. Expanding the roles of pediatricians, family physicians, and pediatric nurse practitioners (PNPs) who provide primary care services to children may be a strategy to address in this issue.

Enhancements in current PNP education and certification processes are needed to support the expansion of oral health-related clinical responsibilities. Although oral health is included in the published curriculum for PNPs and certification exams require specific oral health knowledge, gaps in postgraduate training persist and few data document the extent to which current oral health-related educational goals are being achieved.

We recommend enhancements in oral health education and research to evaluate curriculum innovations, the development of partnerships between stakeholder groups to leverage existing resources, and ongoing surveillance of oral health-related practice patterns among PNPs. Leadership at the national level is needed to develop policies that support curriculum changes and the implementation of oral health practice guidelines for PNPs that will improve access and reduce health disparities.

KEY WORDS: oral health education; oral health policies; pediatric nurse practitioner

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The 2000 Surgeon General's Report on Oral Health called attention to large disparities in children's oral health.¹ That same year, Healthy People set their 2010 oral health goals, one of which was to reduce the proportion of young children who experience dental caries in their primary teeth.² Despite these calls to action, over the past decade the proportion of children aged 2 to 5 years with dental caries increased from 19% to 24%.³ In fact, dental caries remains the greatest unmet children's health need in the United States, particularly among young children.⁴

Access to dental care and oral health status are highly correlated with socioeconomic status. According to a 2005 General Accounting Office report, poor children have 5 times more untreated dental caries than children in higher-income families.⁵ Poor children also suffered nearly 12 times more restricted-activity days, (eg, missing school) as a result of dental problems compared with higher-income children. Left untreated, the pain and infection caused by tooth decay can lead to problems with eating, speaking, and attending to learning.⁵

Although expansions in insurance coverage have improved access to oral health care, untreated tooth decay continues to be a significant problem, even for children with public insurance coverage.^{6,7} A recent study found that children enrolled in Medicaid or the State Children's

Health Insurance Program were 1.7 times more likely to have untreated dental caries than children not enrolled in one of these programs.⁷

One explanation for children's oral health problems is the well-documented workforce shortage.⁸ The current workforce of dentists in the United States is inadequate to meet the oral health care needs of children in terms of numbers of dentists, as well as their distribution, ethnicity, education, and practice orientation, and the situation may be getting worse as the dentist-to-population ratio continues to decline.⁹ An estimated 25 million individuals reside in areas lacking adequate dental care services as defined by Health Professional Shortage Area criteria.¹ Additional barriers to access include limited instruction and experience in treating children in the predoctoral curriculum and reluctance among practicing dentists to serve low-income children for a variety of reasons, including low reimbursement rates.^{10,11} Expanding the role of primary care medical and nursing professionals to include preventive oral health care may be an important strategy for addressing this unmet need.

Pediatric nurse practitioners (PNPs), pediatricians, and other health care professionals who care for children have more frequent visits with children and are far more likely than dentists to encounter children at an early age when prevention should begin. Nondental health professionals must be prepared to identify risk factors for early childhood caries and other oral health problems and to make appropriate decisions regarding timely and effective intervention and referrals.

This paper reviews the current oral health-related curriculum and credentialing process for PNPs and evaluates the need for policy changes that would maximize the potential

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role of PNPs in reducing oral health disparities among children.

CURRENT AND POTENTIAL ROLE OF PNPS

PNPs can play an important role in providing oral health screening, early risk assessment, and preventive services to children who are at the highest risk for early childhood caries. Of the over 125 000 nurse practitioners in the United States, nearly 13 000 are PNPs.^{12,13} They are more likely than physicians and dentists to practice in underserved areas and to care for large numbers of patients who are uninsured or on Medicaid.¹⁴ A recent survey of graduates from 13 PNP programs in the United States found that 45% provided care in medically underserved areas, 66% provided care to children with Medicaid coverage, and 25% provided care to children with no or limited health care coverage.¹⁵ Also, PNPs are employed in a variety of health care settings, including but not limited to ambulatory centers, private practices, outpatient and inpatient hospital settings, urgent care and emergency settings, and community health settings. Health promotion and disease prevention strategies are embedded in PNP practice and include routine health care maintenance, assessment, diagnosis and treatment of common acute and chronic conditions, and anticipatory guidance at each health care visit. Thus, PNPs are well positioned to begin the oral health care process, including ensuring that patients establish a dental home by 12 months of age.

CURRICULUM AND CERTIFICATION OF PNPS

Primary care PNPs are educated at the graduate level (master's degree), with doctoral preparation (doctorate in nursing practice) proposed by the American College of Nurses by 2015.¹⁶ The core curriculum, published by the Association of Faculties of Pediatric Nurse Practitioner Programs, includes a comprehensive overview of oral health topics.¹⁷ These topics include assessment of the oral cavity, including evaluation of primary and secondary dentition; common oral health concerns, including recommendation for the first dental visit, recognition of malocclusions, dental caries, and dental injuries; recommendations for brushing and oral hygiene; pacifiers and bottles and recommendations for prevention of dental problems; focus on children's oral health needs and dental hygiene; and oral health and dental health issues for children with special needs such as cleft palates.

Clinical placements supervised by PNPs or pediatricians are another integral part of the PNP curriculum. The major focus of these primary care experiences is the development of expertise in physical assessment skills, including examination and evaluation of the oral cavity. Clinical experiences for students at New York University (NYU) College of Nursing graduate program are tracked using Typhon technology,¹⁸ in which students document patient encounters, type of visit, diagnosis codes, treatment management plans, and referrals for each patient seen. These data revealed that within 195.6 clinical hours (1-semester clinical hour requirement in primary care),

the typical NYU PNP student saw 248 children, 163 of whom were seen for annual/well-child visits that included examination of the oral cavity and decision making (ie, healthy vs disorder or disease, and interventions including referrals as appropriate). Using this system, NYU can track student adherence to prescribed oral health-related practice recommendations and other components of the patient exam.

The Typhon system at NYU is one of several approaches used to fulfill the requirement of the National Organization of Nurse Practitioner Faculties that all nurse practitioner (NP) programs conduct curriculum evaluations.¹⁹ However, there are several outstanding questions regarding best practices for evaluating core competencies and associated curriculum, including those associated with the delivery of oral health care.

Currently, no national data report how PNP programs evaluate students' oral health-related clinical ability, to what extent they implement the recommended oral health core curriculum, and how they measure success and failure of curriculum innovations. Moreover, the requirements of the National Organization of Nurse Practitioner Faculties for evaluation of students' clinical skills are currently based on clinical hours rather than specific appraisals of clinical competencies and therefore are unlikely to measure the desired educational outcomes. Discussions at the national level are underway regarding how to revise the current evaluation process. For oral health in particular, a working group needs to be convened under the umbrella of the National Association for Pediatric Nurse Practitioners (NAPNP) or the Association of Faculties of Pediatric Nurse Practitioners (AFPNP), whose purpose would be to collect and share data on the strategies that PNP programs are using to implement oral health education and create standard methods for assessing student competencies in this area.

In terms of credentialing, PNP certification examinations are offered by 2 organizations, the Pediatric Nursing Certification Board (PNCB)²⁰ and the American Nurses Credentialing Center (ANCC).¹⁶ Both organizations' exams include oral health-related questions. These exams are developed from the analysis of comprehensive role delineation studies conducted by the individual certification bodies to determine the national trends in practice responsibilities and role functions for primary care PNPs. The most recent role delineation study conducted by the PNCB surveyed 1800 certified PNPs.²⁰ It found that counseling concerning oral health and dental health, and anticipatory guidance in such areas as thumb sucking, pacifier use, prevention of caries, and biting were frequent PNP activities. The results indicate that PNPs consider oral health a routine part of the health care visit. Moreover, the study's endorsement of the role of PNPs in providing oral health services led to the inclusion of this area in the primary care certification examination.

The PNCB also requires each individual to complete a sequence of continuing education activities over a 7-year cycle.²⁰ Primary care self-assessment examinations containing oral health-related articles and

examination questions are a part of these activities. However, continuing education for practicing PNPs is an area that needs further development. NAPNAP, the professional association for PNPs and other advanced practice nurses who care for children, should consider highlighting oral health as one of their special interest groups and offering a continuing education program based on the American Academy of Pediatrics (AAP) oral health training.²¹ The AAP, the University of Washington, and several other organizations and institutions have defined oral health competencies and outlined curriculum for the nondental health care workforce.^{21,22} For example, the University of Washington School of Medicine has designed a comprehensive oral health curriculum for medical students, and the AAP has launched a multicomponent, oral health initiative, including a training program and oral health practice guidelines for pediatricians, that can be found on its Web site. The AAP initiative, in particular, provides a template for NAPNAP to develop an oral health program that is tailored to the needs of NPs who treat children. Collaboration between NAPNAP, AAP, American Academy of Family Physicians (AAFP), American Academy of Pediatric Dentistry, and other stakeholder groups is needed to ensure the widest dissemination of consistent evidence-based practice recommendations.

IMPROVING CHILDREN'S ORAL HEALTH THROUGH PNPs

Several publications and PNP textbooks reinforce the important role of PNPs in addressing oral health issues among children.^{23–25} Advising families in proper oral health, fluoride supplementation, prevention of damaging oral health habits and tooth decay, and the need for referrals to pediatric dentists are standard for anticipatory guidance.^{23–25} The use of anticipatory guidance allows parents, caregivers, and children to understand how, in the case of oral health, the oral cavity changes over time and to develop age-appropriate, risk-reduction strategies for each stage of tooth development.²⁶ Using this approach, PNPs empower parents to be the “health champion role model” for their children.

PNPs are particularly well positioned to provide oral health screening and preventive services because of the holistic, family-centered, health-promotion framework that guides PNP practice. Given this approach to patient care, it is not surprising that studies of NP practice suggest that NPs are more likely to offer health promotion recommendations.^{27–29} Importantly, they can provide the timely delivery of anticipatory guidance for parents and caregivers early in a child's life, even before teeth erupt and well before they have their first dental visit.

To realize the full potential for PNPs to improve children's oral health, however, PNPs must acquire the knowledge, skills, and confidence to provide the full range of oral health-related screening risk assessment and preventive services, including fluoride treatments. Innovations in training, such as creating opportunities for interprofessional learning, is one strategy for increasing oral health

competencies. These types of interdisciplinary training programs are already being implemented in several schools, including University of Washington and NYU.^{30,31}

In 2005, the NYU College of Nursing and College of Dentistry decided to create a formal partnership. This new paradigm, a college of nursing within a college of dentistry, has provided numerous opportunities to test an interdisciplinary educational model. For example, PNP students rotate through dental clinics (eg, pediatric dental clinic) and participate in outreach programs with dental students (eg, Head Start). During these rotations, PNP students practice oral health assessment skills, including caries risk assessments, and learn the application of fluoride varnish. This experiential learning process provides an opportunity for the PNP student to understand the relevance of oral health to their practice and improves oral health-related clinical skills. For the dental students, this is an opportunity to understand the role PNPs play in oral health, to develop skills for partnership across professions, and to gain greater competency and confidence in recognizing and addressing relevant systemic health issues.

Interprofessional education models that include dental and nursing students are potentially replicable in numerous institutions across the country. These institutions include 20 accredited dental colleges with a co-located nurse practitioner program.³² Where dental schools are not available, nursing faculty can explore educational opportunities, such as community dental clinics and Head Start programs.

EDUCATIONAL AND POLICY IMPLICATIONS

Our review found that oral health is included in the published core curriculum for PNPs, the certification process requires specific oral health knowledge, and PNPs consider oral health a routine part of well-child care. However, we recommend pursuing several educational and policy activities to optimize the potential for PNPs to impact oral health disparities.

First, we need to define the best strategies for accomplishing our educational goals for nondental health professionals, including PNPs, and we have no assurances that current oral health-related educational approaches in PNP programs are effective. As described previously, several groups have begun to define crosscutting competencies and to create new curricula for the nondental health care workforce.^{21,22} The AAP has developed several training modules on oral health and fluoride varnish application. North Carolina's Into the Mouth of Babes offers continuing medical education credit for attending training on oral health screening, parent education, and fluoride varnish,³³ and interprofessional training programs are also a promising approach that is being explored in several states. Although, some of these projects have planned outcome assessments, in most cases the resources to conduct rigorous evaluations of curriculum innovation, at both the graduate and postgraduate level, are limited. A funding infrastructure for education research and program evaluation that also supports partnerships between researchers, educators, and professional associations is

needed to advance educational goals and ensure that data are available to evaluate the efficacy of current educational programs.

With the expansion of training programs for practicing clinicians, national data on provider practice patterns are also needed to track the translation of recommended guidelines into practice. Oral health service-related questions could be added to existing surveillance systems like the Centers for Disease Control and Prevention's National Ambulatory Medical Care Survey, a national survey designed to provide data on the use of ambulatory medical care services in the United States.³⁴ Strong partnerships among professional organizations and academic programs would provide the leadership needed to implement the necessary surveillance systems.

Second, in a crowded curriculum, incentives are needed to ensure that students are obtaining the necessary knowledge and skills during their professional training. National organizations that are responsible for certification are in a position to provide the incentives for curriculum enhancement. The PNCB and American Nurses Credentialing Center can increase the number of questions on oral health in future examinations. The Commission on Collegiate Nursing Education, which provides accreditation of individual colleges/schools of nursing, can also raise the importance of oral health competencies in their review process.

Third, we found significant gaps in postgraduate training. NAPNAP, whose mission is to promote optimal health for children through leadership, practice, advocacy, education and research, has not identified oral health as a priority issue, and we are not aware of programs similar to that of AAP or North Carolina that target PNPs. Specifically, we found no programs designed to train practicing PNPs to apply fluoride varnish, yet this procedure is increasingly becoming a routine part of pediatric care and is now reimbursed by Medicaid in 31 states.³⁵ Some states are reimbursing nurse practitioners and physician's assistants for performing these services, further expanding the pool of providers available to deliver preventive dental services to young children.³⁶ PNPs should provide this effective preventive service in their practice. NAPNAP, in partnership with PNP programs, can play a key role by developing a policy statement that outlines the extent of the problem, the unique role of NPs who care for children, and delineate recommended guidelines for the prevention, identification, and management of oral health and dental disease in children. PNPs can build on the lessons learned from the North Carolina experience and the AAP, which demonstrate the importance of simultaneously ensuring that the reimbursement structures are aligned with enhanced expertise and new service provision. NAPNAP and other NP professional associations can learn from the experience of the associations of professional organizations in other states to advocate for expanding the reimbursement for oral health services. Moreover, movement toward a more integrated health care system will require that reimbursement policies are consistent with practice recommendations, including expanding reimbursement

from private insurers for oral health services provided by nondental professionals.

Collaboration is essential. Organizations must work collectively rather than in isolation to coordinate efforts to ensure that resources continue to be available to build on the current momentum and to leverage the progress already made by initiatives at the University of Washington and Into the Mouth of Babies.

Finally, as the nondental workforce increasingly addresses oral health in children, demand for dental services, particularly among young children, will increase. Meeting this demand will require a seamless referral system between PNPs and pediatric and general dentists, which will assist families to establish a dental home. A recent survey of pediatric primary care providers found that the referral environment was more important than provider knowledge in determining whether medical practitioners referred at-risk children for dental care.³⁷ Therefore strategies, including the use of new technologies, are needed to facilitate coordination of care and cooperation between dental and medical health professionals. Here, collaboration between dentistry and medicine is critical. The American Dental Association, American Dental Hygiene Association, and national and local medical and nursing organizations should collaborate to create and widely promote a Web-based referral system that would offer providers a simple way to find local dentists who will accept referrals.

Conclusions

PNPs are on the front line of children's health care delivery. They have potential to influence child oral health care by implementing a standard of evidence-based oral health care that includes oral health assessment, preventive services, and appropriate referrals from birth through young adulthood. Collaboration across disciplines and agencies is needed to establish and disseminate core curriculum, to continue to develop and evaluate postgraduate continuing education courses for nondental professionals, and to address unanswered questions that relate to what types of preventive services can be reasonably delivered outside the dental home. Children who are at highest risk for dental problems are still those who are least likely to receive preventive dental care. Closing the gap between what we know works to prevent dental caries and the consistent equitable delivery of these services is possible but will require an interprofessional coordinated effort.

REFERENCES

1. United States Department of Health and Human Services. Oral Health in America: A Report of the Surgeon General. 2000. Available at: <http://www.surgeongeneral.gov/library/oralhealth/>. Accessed June 2009.
2. Healthy People. Healthy People 2010. Available at: <http://www.healthypeople.gov/>. Accessed June 5, 2009.
3. Dye BA, Tan S, Smith V, et al. Trends in oral health status, United States, 1988–1994 and 1999–2004. *National Center for Health Statistics. Vital Health Stat.* 2007;(248):1–92.
4. Newacheck PW, Hughes DC, Hung YY, et al. The unmet health needs of America's children. *Pediatrics.* 2000;105(4 pt 2):989–997.

5. US Government Accountability Office. Oral health: dental disease is a chronic problem among low-income populations. Available at: <http://www.gao.gov/cgi-bin/gettrpt?GAO/HEHS-00-72>. Accessed February 11, 2005.
6. Fisher MA, Mascarenhas AK. Does Medicaid improve utilization of medical and dental services and health outcomes for Medicaid-eligible children in the United States Community? *Dent Oral Epidemiol*. 2007; 35:263–271.
7. Brickhouse TH, Rozier RG, Slade GD. Effects of enrollment in Medicaid versus the state children's health insurance program on kindergarten children's untreated dental caries. *Am J Public Health*. 2008;98:876–888.
8. Davis MJ. Pediatric dentistry workforce issues: a task force white paper. *Pediatr Dent*. 2000;22:331–335.
9. Nash DA. Expanding dental hygiene to include dental therapy: improving access to care for children. *J Dent Hyg*. 2009;83:39–44.
10. Nash DA. Developing a pediatric oral health therapist to help address oral health disparities among children. *J Dent Educ*. 2004;68:8–20.
11. Hughes DC, Duderstadt KG, Soobader MP, Newacheck PW. Disparities in children's use of oral health services. *Public Health Rep*. 2005; 120:455–462.
12. American Academy of Nurse Practitioners. The voice of the nurse practitioner: 2008 annual report. Available at: <http://www.aanp.org/NR/rdonlyres/97CD0283-59DF-4964-819B-61E58864B4F8/0/08AnnualReport.pdf>. Accessed June 23, 2009.
13. National Association of Pediatric Nurse Practitioners. The mission statement. Available at: <http://www.napnap.org/index.aspx>. Accessed April 5, 2009.
14. Grumbach K, Hart LG, Mertz E, et al. Who is caring for the underserved? A comparison of primary care physicians and non physician clinicians in California and Washington. *Ann Fam Med*. 2003;1:97–104.
15. Jackson AP, Fennie KP, Jalkut MK. Employment characteristics and role functions of recent PNP graduates (primary care approaches). *Pediatr Nurs*. 2008;34:151–161.
16. American Nurses Credentialing Center. Board certification of nurses makes a difference. Available at: <http://www.nursecredentialing.org>. Accessed April 5, 2009.
17. Ryan-Wenger NA. *Core Curriculum for Primary Care Pediatric Nurse Practitioners*. St. Louis, Mo: Mosby; 2007.
18. Typhon Group Health Care Solutions. Typhon Group LLC. Available at: <http://www.typhongroup.com/products/tracking.htm>. Accessed April 5, 2009.
19. National Organization of Nurse Practitioner Faculties. Criteria for Evaluation of Nurse Practitioner Programs: A Report of the National Task Force on Quality Nurse Practitioner Education. Available at: <http://www.nonpf.org/associations/10789/files/NTFEvalCriteria2008Final.pdf>. Accessed April 5, 2009.
20. Pediatric Nursing Certification Board. Become Certified in Primary Care. Available at: <http://www.pncb.org>. Accessed April 5, 2009.
21. American Academy of Pediatrics. Oral Health Initiative. Available at: <http://www.aap.org/commpeds/doch/oralhealth/>. Accessed April 5, 2009.
22. Mouradian WE, Reeves A, Kim S, et al. An oral health curriculum for medical students at the University of Washington. *Acad Med*. 2005; 80:434–442.
23. Jones KF, Berg JH, Coody D. Update in pediatric dentistry. *J Pediatr Health Care*. 1994;4:160–167.
24. DiMarco MA. *Access/utilization of dental by homeless children [dissertation]*. Cleveland, Ohio: Case Western Reserve University; 2007.
25. DiMarco MA, Huff M, Kinion E, Kendra MA. The pediatric nurse practitioner's role in reducing oral health disparities in homeless children. *J Pediatr Health Care*. 2009;23:109–116.
26. Pender N. *Health Promotion in Nursing Practice*. 3rd ed. Norwalk, Conn: Appleton & Lange; 2006.
27. Munding MO, Kane RL. Health outcomes among patients treated by nurse practitioners or physicians. *JAMA*. 2000;283:2521–2524.
28. Venning P, Durie A, Roland M, et al. Randomised controlled trial comparing cost effectiveness of general practitioners and nurse practitioners in primary care. *BMJ*. 2000;320:1048–1053.
29. Kinnersley P, Anderson E, Parry K, et al. Randomised controlled trial of nurse practitioner versus general practitioner care for patients requesting "same day" consultations in primary care. *BMJ*. 2000;320: 1043–1048.
30. Mouradian WE, Schaad DC, Kim S, et al. Addressing disparities in children's oral health: a dental-medical partnership to train family practice residents. *J Dent Educ*. 2003;67:886–895.
31. Shelley D, Mevi A, Abu-Rish E, et al. Preliminary steps toward creating an interprofessional international public health program. *J Interprof Care*. 2009;23:417–419.
32. American Dental Association. Dental practice survey. Your child's teeth. Available at: http://gsa.ada.org/search?q=Your+child%27s+teeth&site=ADAorg_Collection&client=ADAorg_FrontEnd&proxystylesheet=ADAorg_FrontEnd&output=xml_no_dtd&proxyreload=1&btnG.x=21&btnG.y=10&btnG=Search. Accessed October 5, 2009.
33. Into the Mouth of Babes Web site. Available at: http://www.communityhealth.dhhs.state.nc.us/dental/Into_the_Mouths_of_Babes.htm. Accessed October 5, 2009.
34. Ambulatory Medical Care Survey. National Center for Health Statistics. Available at: <http://cdc.gov/nchs/about/major/ahcd/ahcd1.htm>. Accessed October 5, 2009.
35. American Academy of Pediatrics. Oral Health Initiative: A program of the American Academy of Pediatrics. Available at: <http://www.aap.org/commpeds/doch/oralhealth/fluoride.cfm>. Accessed June 29, 2009.
36. Cantrell C. The role of physicians in children's oral health. State Health Policy Monitor. December 2008;2. Available at: <http://www.nashp.org/files/Fluoride%20Varnish%20Monitor.pdf>. Accessed April 5, 2009.
37. Dela Cruz GG, Rozier G, Slade G. Dental screening and referral of young children by pediatric primary care providers. *Pediatrics*. 2004;114:e642–e652.