# Examining Whether Dental Therapists Constitute a Disruptive Innovation in US Dentistry

Dental therapists—midlevel dental providers who are roughly analogous to nurse practitioners in medicine—might constitute a disruptive innovation within US dentistry.

Proponents tend to claim that dental therapists will provide more equitable access to dental care; opponents tend to view them from a perspective that focuses on retaining the current attributes of the dental profession. Therapists display traits similar to those of disruptive innovations: their attributes are different from dentists', they may not initially be valued by current dental patients, they may appeal to current dental underutilizers, and they may transform the dental delivery system.

Whether dental therapists constitute a disruptive innovation will only be determined retrospectively. (*Am J Public Health.* 2011;101:1831–1835. doi:10.2105/AJPH.2011.300235)

Burton L. Edelstein, DDS, MPH

**ACCORDING TO CHRISTENSEN** et al.,

> In any industry . . . while the dominant players are focused on improving their products and services . . . they miss simpler, more convenient, and less costly offerings initially designed to appeal to the low end of the market[1(p104)]

Christensen et al. called such offerings "disruptive innovations."[1] Dentistry in the United States may be facing a disruptive innovation in the form of dental therapists, midlevel dental providers who are roughly analogous to nurse practitioners in medicine. Dental therapists deliver services that in the United States are traditionally provided only by dentists, such as fillings and extractions. I examine whether dental therapy might constitute a disruptive innovation within US dentistry. I then report and analyze the antithetical position statements of organizations supporting dental therapy (primarily public health and advocacy groups) and opposing it (primarily associations of dentists) in light of this model.

Bower and Christensen said that disruptive innovations have 2 essential characteristics: (1) they "present a different package of performance attributes—ones that, at least at the onset, are not valued by existing customers," and (2) they develop "the performance attributes that existing customers do value" until they "invade established markets."[2] The authors warned that by time the innovation is established, "it is often too late" for the preexisting providers to retain market control, and the "pioneers of the new technology dominate the market."[2] This formulation, borrowed from the business literature and applied to health care,[1] captures proponents' aspirations to equity as well as opponents' protective concerns that opening the door to innovation will lead to a slippery slope of eroding market share or professional authority.

For proponents of dental therapy, development and deployment of therapists in the United States constitutes an appropriate, albeit potentially disruptive, innovation. Such deployment, they assert, could increase dentists' efficiency and effectiveness while allowing safe, high-quality essential dental services to be provided to the "low end of the market"—those whose social and financial circumstances limit their access to dental care. For opponents, the development and deployment of therapists in the United States constitutes an inappropriate and definitely disruptive innovation that threatens the very definition of the term "dentist." Opponents also believe that the advent of dental therapy augurs poorly for dentists' preeminence because once a therapist is established, he or she may seek ever-greater authority and autonomy.

Dental therapists differ from other existing and proposed midlevel dental providers in their potential to be disruptive. Nondentist oral health care providers include dental hygienists, dental assistants, expanded-function dental hygienists or assistants, advanced dental hygiene practitioners, pediatric oral health educators, and community dental health coordinators.[3–5] Unlike most of these others, the therapist's duties include functions that, in the United States, until recently have been reserved for dentists alone. In sharp distinction to the United States, dental therapy has been established in many other countries for many decades.[6,7] Its gradual introduction in the United States occurred in 2003 through the dental health aide therapist program administered by the Alaska Native Tribal Health Consortium,[8] and in 2009 through authorizing action by the Minnesota state legislature.[9]

Considering the potential for innovation to better serve the public's health, Christensen et al. suggested 4 approaches for system transformation: (1) "Create—then embrace—a system where the clinician's skill level is matched to the difficulty of the medical problem," (2) "invest less money in high-end complex technologies and more in technologies that simplify complex problems," (3) "create new organizations to do the disrupting," and (4) "overcome the inertia of regulation."[1]

## DENTAL THERAPY ANALYZED AS A DISRUPTIVE INNOVATION

The following comparison of the attributes of disruptive innovations with dental therapy may reveal whether dental therapy constitutes a disruptive innovation.

### Different Package of Performance Attributes

In Australia, Canada, England, New Zealand, and the Netherlands,

the attributes of dental therapists differ from those of dentists.[5] Therapists receive less training than dentists, typically over a period of 2 to 3 years after the therapist completes secondary school. They commonly are recruited from underserved populations, with the goal of lessening sociocultural, language, and income disparities between providers and patients. They deliver a smaller range of services than dentists do, and they defer to the dentist for more complex procedures and for management of complex patients. They are most often deployed where underserved populations disproportionately seek care (e.g., in safety-net locations such as school- and community-based clinics, where only about 5% of dentists practice).[10] Although therapists may be deployed in traditional dental offices, their uptake by private practitioners is modest, as is the uptake of expanded-function dental assistants in the United States. For instance, in the United Kingdom most employing dentists delegate a narrower range of services to therapists than therapists are trained to deliver.[11,12] Proponents of dental therapy argue that these attributes are essential for addressing disparities in availability and acceptability, but opponents argue that these attributes constitute second-class care that could endanger the health and safety of patients and the public.

### Not Valued by Existing Customers

Existing customers are the higher-income and commercially insured Americans who utilize dental services at twice the rate of poor and low-income Americans, many of whom have public coverage.[13] Existing customers receive dental services exclusively from dentists, predominantly in the private sector. Because these patients are well-served, at least to their desired level of care, they have little need for or interest in receiving care from dental therapists. Caswell Evans, editor of the US surgeon general's report *Oral Health in America*, summarized the status quo thus: "US dental care works well for those who can access it and afford it. The others are left out in the cold and they suffer the consequences" (e-mail communication, Caswell A. Evans, DDS, MPH, University of Illinois, February 2011). Proponents of dental therapy in the United States point to the substantial proportion of the US population who report being unable to access dental services when desired. Opponents champion the satisfaction of patients who do receive care from dentists and caution against care that they believe would be insufficient and of poorer quality if delivered by therapists to those who are currently underserved.

### Appeal to Low End of Market and Invade Established Markets

The low end of the market comprises the 44% of Americans who do not access dental services in a given year. A disproportionate number of these individuals have low and modest incomes and are racial/ethnic minorities.[13] Their numbers include many children, immigrants, migrants, disabled people, frail elders, and institutionalized people. Most are eligible for or enrolled in public insurance programs (Medicaid and Children's Health Insurance Programs), but access to care under these programs is markedly constrained by the paucity of actively participating providers.[14] Proponents suggest that dental therapists will increase access for these individuals, but opponents argue that without legal constraints on deployment that would limit therapists exclusively to the safety net, therapists will migrate to the private sector and displace care that is now provided by dentists.

### Simpler, More Convenient, and Less Costly Offerings

All agree that therapists' services are simpler (i.e., that they provide care that is more basic and limited than that provided by dentists). However, there is strong disagreement over whether the care they provide is more convenient and less costly. Proponents claim that convenience is assured when therapists are deployed in inner-city neighborhoods and rural or frontier areas where dentists are sparse. They also say that convenience is further assured when the therapists' sociocultural and language attributes match those of the populations they serve. Opponents note that having to access 2 different providers—the therapist for basic services and the dentist for advanced services—is inherently inconvenient, may be redundant, and may disrupt the dentist–patient relationship. Whether institutionalizing dental therapists is less costly will depend on whether duplication in providers arises and whether the profit arising from care provided by lower-paid therapists accrues to dentists, insurers, or patients.

### Systems Transformation

The principle of matching clinicians' skill level to the difficulty of the problem requiring treatment is also hotly debated. Proponents argue that much of what dentists do can be readily delegated, whereas opponents claim that the full range of a dentist's knowledge and skills are essential to provide comprehensive, high-quality care. Investing in dental therapists rather than more dentists is also controversial. Proponents assert that having more of the same providers will only produce more of the same disparities, but opponents suggest that the supply of providers is inconsequential (although their distribution may be significant) because the problem too often lies in the failure of underserved populations to seek needed care except when in pain. Proponents note that program accreditation for education and training of dentists and hygienists currently falls exclusively to the American Dental Association's Council on Dental Accreditation, whereas education and training of medical providers is split between agencies that accredit physicians, nurses, nurse practitioners, and physician assistants. Thus, proponents call for new organizations, in the words of Christensen et al., "to do the disrupting,"[1] whereas opponents seek to have the Council on Dental Accreditation accredit new dental therapy programs. There are also antithetical views of the "inertia of regulations," specifically the impact of state dental practice acts, with proponents suggesting that these acts limit innovation and exist primarily to protect the status quo, and opponents arguing that they protect the public's health and safety.

Taken together, these attributes suggest that the elements of disruptive innovation apply to the dental therapist debate and help explain the antithetical position statements of its proponents and opponents.

## EXAMPLES OF PROPONENTS' AND OPPONENTS' VIEWS

Proponents of dental therapy include a variety of public health and consumer groups, as well as organizations committed to social

justice and equitable health care. The American Dental Hygienists' Association, representing its nondentist membership, is also a supporter of new midlevel providers. Proponents tend to advocate for the interests of the underserved public as opposed to the interests of the professions. They rely on considerable experience in other countries[6,7] and newer experience in Alaska[8] to support their position, including evidence of safe, technically appropriate care.[15,16] In so doing, they endorsed what Bower and Christensen characterized as the "different package of performance attributes" of therapists compared with dentists, and they suggested that these new attributes would be well-received by patients (i.e., those who are currently underserved). Proponents tend to view therapists as expanding rather than displacing the current availability of care providers.

Opponents are predominantly national and state dental associations whose members are dentists and whose missions extend to protection of the public's health and safety. By definition, they represent the interests of the profession and tend to reflect the protective impulse that supports the status quo. In terms of disruptive innovation, they raise concerns about the performance attributes of therapists, suggesting that the public's health and safety are likely ill-served by therapists who are less educated and trained than dentists. They question the social acceptability of therapists and thereby raise doubts that patients will value therapists. Most centrally, in light of disruptive innovation opponents raise specific concerns about dentists being displaced by this "new technology." Yet, careful reading of opponents' position statements suggests nuances that often seek middle ground.

All agree that disparities in oral health care result from a complexity of interwoven factors contributed by the professions, consumers of dental care, and structures of the dental care system. On the consumer side are etiologies rooted in social determinants, shortcomings of public insurance, health illiteracy, and valuation of dental care, particularly when such care competes with other needs and interests. On the professional and systems side are issues of financing, workforce supply, adequacy of the dental safety net, and public health infrastructure. Each group views the various roles of government differently, with consumer-focused groups seeing government as acting on behalf of the underserved, and professional groups seeing government as acting in the interest of public health and safety.

The ongoing debate over dental therapists is spurred by a number of drivers, including the persistence of access and utilization disparities; congressional interest as expressed in the 2009 reauthorization of the Children's Health Insurance Program,[17] the health care reform legislation of 2010,[18] congressional hearings,[19,20] and a report by the US Government Accountability Office[14]; action by state policymakers[21]; professional interests; foundation concerns; and an Institute of Medicine workshop.[3]

## Proponents' Statements

Among therapy proponents, the Pew Children's Dental Campaign asserts that

> [n]ew provider types may offer a way for states to help ensure that vital and routine dental care is accessible to constituents regardless of age, race, ethnicity, income, geographic location or insurance status[4]

and that the Minnesota law authorizing dental therapists "will likely ensure dental care for many children who are underserved."[22] Community Catalysts, a consumer advocacy organization, described dental therapists as offering "a tangible and proven way to deliver affordable care."[23] The American Dental Hygienists' Association, commenting on a study of the Alaska Native dental therapist program,[24] noted that alternative providers positively affect access to care.[25] Similarly, the American Association of State and Territorial Dental Directors, the American Association of Public Health Dentistry, and the American Public Health Association assert that dental therapists will "improve access"[26,27] and "fill gaps"[28] in the existing delivery systems. Proponents note that 50 million Americans—one sixth of the US population—live in federally designated Dental Health Professions Shortage Areas, which would require 9642 additional dentists (about a 5% increase) to meet a minimum dentist-to-population ratio of 1:3000.[29] They also point to the graying of American dentists, the maldistribution of dentists, the lack of care being provided to vulnerable populations, and the ongoing increase in provision of elective cosmetic dental care, which may reduce the supply of basic services.

A primary argument in favor of greater delegation of basic dental services to lesser-trained allied dental personnel is that dentists are overtrained for much of what they do. This argument parallels the argument in favor of midlevel medical personnel and extends to other professions. Proponents suggest that the role of the dentist will be elevated, rather than diminished, by the advent of dental therapists, as the dentist focuses more on the most complex procedures and the most complex patients. Proponents also point to the results of outgoing dental student surveys[30] to support their claim that new dentists are not well-prepared to care for the neediest populations, and they suggest that the persistence of access disparities is evidence of the professions' inability or unwillingness to fix the problem.

## Opponents' Statements

Opponents of dental therapy articulate specific concerns that relate to the public's health and safety. The American Dental Association supports expansions of the dental team, but the organization opposes the introduction of those who would "perform such irreversible surgical procedures as extracting teeth, drilling cavities, and performing pulpotomies," because "these procedures involve the use of high-speed drills in the mouth and require the skills of a licensed dentist to ensure patient safety and health."[31] A position statement by the Academy of General Dentistry (AGD) says:

> Because underserved patients often exhibit a greater degree of complications and other systemic health conditions, the use of lesser-educated providers risks jeopardizing the patients' health and safety.[32(p1)]

The AGD therefore provides conditional support for dental therapists to deliver irreversible procedures as long as dentists retain diagnostic responsibility:

> Auxiliaries must be prohibited from engaging in the performance of irreversible procedures without direct dentist supervision and from diagnosing conditions of oral health regardless of supervision.[32(p4)]

The position of the American Academy of Pediatric Dentistry (AAPD) is somewhat more expansive and nuanced, noting that certain midlevel providers, including

> Dental Therapists working under the supervision of dentists . . . are conceptually compatible with AAPD core values, oral health policies and clinical guidelines, and definition of the dental home. . . . AAPD supports the use of mid-level dental providers who perform or assist in the delivery of specified reversible procedures and certain surgical procedures under the general supervision of a dentist, provided that such arrangements have been thoroughly evaluated and demonstrated to be safe, effective, and efficient and to not compromise quality of care in similar settings.[33(p25)]

Notably, AAPD's position allows for general supervision (i.e., with the dentist available but not present), whereas AGD's position requires direct supervision (i.e., with the dentist physically present). AAPD asserts that the evaluation standard it establishes in its policy was not met in the first objective study of the Alaska Dental Health Aide Therapist Program.[34]

Some dentists argue that therapists will not care for the underserved and will "dilute" the availability of care for those currently well-served.[35] The AGD's president questions whether therapists will compete for "restorative dentistry, the mainstay of those of us in general practice."[36] Other opponents suggest that introducing dental therapists would institutionalize 2-tiered care, offering the most vulnerable a lower level of care that would further aggravate disparities. AGD asserts that "[t]his approach will provide lesser-quality care to the poor."[32] The National Dental Association, primarily representing African American dentists and hygienists, cites its members' experience caring for underserved populations when it states that it is "against the Mid Level Oral Health Care Provider except in Alaska, which is geographically isolated" and then "only as a temporary measure." Its 2010 position paper uses irony to imply bias:

> This [institutionalizing dental therapists] seems an acceptable solution for the poor and underserved, while those well-to-do individuals in our society enjoy comprehensive oral health care from licensed dentists.[37]

Casamassimo, in an editorial for *Pediatric Dentistry*,[38] acknowledged that care provided by dental therapists "can be acceptable," but he raises a substantial list of "intended and unintended consequences" that opponents often cite as reasons why dental therapy will not improve access equity in the United States. He articulated the attendant costs related to training, facilities, social support infrastructure, and care provision that meaningful implementation of dental therapy would entail. He also noted that therapists would increase demand for dental services beyond current system capacity, particularly for those with special needs, and that rural placement of therapists could displace the already inadequate numbers of dentists practicing in rural areas. Casamassimo cited the most typical opponent view when he said therapists could "migrate to the private sector" from the "safety net," with particular concern about expansion of "corporate pediatric dental Medicaid clinics."

Inherent in some organizations' policies is a concern that expanding the dental workforce is not an appropriate remedy for oral health care disparities because the source of these disparities lies not with the dental system of care but with failure of individuals to seek care. For example, the AGD "White Paper on Increasing Access to and Utilization of Oral Health Care Services"[32] states that one of the "two biggest challenges in achieving optimal oral health for all" is "underutilization of available oral health care." It articulates noneconomic barriers to care, including "patients' behavioral factors, levels of oral health literacy . . . transportation, location, and cultural/linguistic preferences." Closely linked to this position is the argument that prevention could reduce unmet need to levels that would be manageable by the current dentist supply.

### Summary

Proponents' and opponents' positions show some agreement as well as substantial disagreement. All agree that there is a consequential disparity problem, that much of oral disease is preventable, that some degree of delegation is possible, and that oral health literacy, care facilitation, improved payment policies, and better dental education and training can improve access and utilization. Among organizations there is widespread support for a team approach that should function with a dentist in the lead, although the specifications of such systems vary considerably. There remains substantial disagreement regarding whether the primary problem lies with the profession or the population, whether to institutionalize dental therapy, and, if so, what exactly the therapist's scope of practice, education and training, deployment, and supervision should be.

## CONCLUSIONS

A number of factors will determine whether development and deployment of dental therapists will take hold in a way that redresses access disparities. Among these are the length and cost of therapist education and training, therapists' income expectations, and the market for their services. These in turn will be significantly influenced by state practice acts' designations of scope, supervision, and deployment. Therapists' inclusion in the dental team will be affected by whether practitioners and the public accept them, as will dentists' capacity to manage systems of care that build on meaningful delegation. Such systems will in turn depend upon health information technology and teledentistry that can facilitate care coordination among providers, revise concepts of supervision, and support formal quality assurance and accountability programs. These care systems will also depend on financing systems that allocate potential cost savings appropriately across dentists, insurers, and patients.

Disruptive innovations can only be definitively identified retrospectively, so only time will tell whether development and deployment of dental therapists in the United States will constitute such an innovation. Only experience will determine whether the advent of dental therapy in the United States ultimately supports proponents' aspirations to equity or is constrained by the protective concerns of the profession. ■

### About the Author

*Burton L. Edelstein is with the Section of Social and Behavioral Sciences, College of Dental Medicine, and the Department of Health Policy and Management, Mailman School of Public Health, Columbia University, New York, NY, and the Children's Dental Health Project, Washington, DC.*

*Correspondence should be sent to Burton L. Edelstein, DDS, MPH, College of Dental Medicine/SSBS, 630 West 168th St, Box 20, New York, NY 10032 (e-mail: ble22@columbia.edu). Reprints can be ordered at http://www.ajph.org by clicking the "Reprints/Eprints" link.*

*This article was accepted March 21, 2011.*

### Acknowledgments

This article was developed on the basis of a presentation made by the author at the 15th annual Columbia University

College of Dental Medicine Dunning Symposium, convened at the Greater New York Dental Meeting in New York City on November 29 and 30, 2010. The conference and the author's participation in it were supported by the Robert Wood Johnson Foundation, the W.K. Kellogg Foundation, and the American Association of Public Health Dentistry.

## Human Participant Protection

Protocol approval was not required because no human research participants were involved.

## References

1. Christensen CM, Bohmer R, Kenagy J. Will disruptive innovations cure health care? *Harv Bus Rev.* 2000;78(5):102–112, 199.

2. Bower JL, Christensen CM. Disruptive technologies: catching the wave. *Harv Bus Rev.* 1995;73(1):43–53.

3. Harris TA. *The US Oral Health Workforce in the Coming Decade: Workshop Summary.* Washington, DC: National Academies Press; 2009. Available at: http://books.nap.edu/openbook.php?record_id=12669. Accessed March 12, 2011.

4. Geshan S, Takach M, Hanlon C, Cantrell C. *Help Wanted: A Policy Maker's Guide to New Dental Providers.* Washington, DC: Pew Center on the States; 2009. Available at: http://www.pewcenteronthestates.org/report_detail.aspx?id=52478. Accessed March 11, 2011.

5. Edelstein BL. *Training New Dental Health Providers in the US.* Battle Creek, MI: W.K. Kellogg Foundation; 2010. Available at: http://www.wkkf.org/knowledge-center/resources/2010/Training-New-Dental-Health-Providers-in-the-U-S-Full-Report.aspx. Accessed March 12, 2011.

6. Friedman JW. The international dental therapist: history and current status. *J Calif Dent Assoc.* 2011;39(1):23–29.

7. Nash DA, Friedman JW, Kardos TB, et al. Dental therapists: a global perspective. *Int Dent J.* 2008;58(2):61–70.

8. Nagel RJ. The development and implementation of dental health aide therapists in Alaska. *J Calif Dent Assoc.* 2011;39(1):31–35.

9. Glasrud P, Embertson C, Day T, Diercks RW. *A History of Minnesota's Dental Therapist Legislation or. . . What the Heck Happened Up There?* Minneapolis: Minnesota Dental Association; 2009. Available at: http://www.sfdda.org/web/pdf/ga/Minn%20Dental%20Assoc%20History%20of%20New%20Position.pdf. Accessed March 12, 2011.

10. Edelstein B. The dental safety net, its workforce, and policy recommendations for its enhancement. *J Public Health Dent.* 2010;70(suppl 1):S32–S39.

11. Jones G, Evans C, Hunter L. A survey of the workload of dental therapists/hygienists-therapists employed in primary care settings. *Br Dent J.* 2008;204(3):E5.

12. Godson JH, Williams SA, Csikar JI, Bradley S, Rowbotham JS. Dental therapy in the United Kingdom: part 2. A survey of reported working practices. *Br Dent J.* 2009;207(9):417–423.

13. Manski RJ, Brown E. *Dental Use, Expenses, Private Dental Coverage, and Changes, 1996 and 2004.* Rockville, MD: Agency for Healthcare Research and Quality; 2007. MEPS Chartbook 17. Available at: http://www.meps.ahrq.gov/mepsweb/data_files/publications/cb17/cb17.pdf. Accessed June 13, 2011.

14. US Government Accountability Office. Oral health: efforts under way to improve children's access to dental services, but sustained attention needed to address ongoing concerns. Available at: http://www.gao.gov/products/GAO-11-96. Published November 30, 2010. Accessed February 8, 2011.

15. Bolin KA. Assessment of treatment provided by dental health aide therapists in Alaska: a pilot study. *J Am Dent Assoc.* 2008;139(11):1530–1535.

16. Bader JD, Lee JY, Shugars DA, Burrus BB, Wetterhall S. Clinical technical performance of dental therapists in Alaska. *J Am Dent Assoc.* 2011;142(3):332–336.

17. Children's Dental Health Project. CHIP reauthorization: renewed support for children's dental health. Washington, DC: Children's Dental Health Project; 2009. Available at: http://cdhp.org/system/files/1.%20CHIP%20Reauthorization%20Renewed%20Support%20for%20Children's%20Oral%20Health.pdf. Accessed February 8, 2011.

18. Children's Dental Health Project. Summary of dental provisions in health reform. Washington, DC: Children's Dental Health Project; 2010. Available at: http://www.cdhp.org.php5-4.websitetestlink.com/system/files/Health%20Care%20Reform%20Toolbox.pdf. Accessed February 8, 2011.

19. *Evaluating Pediatric Dental Care Under Medicaid.* Hearing Before the Subcommittee on Domestic Policy of the Committee on Oversight and Government Reform, House of Representatives, 110th Cong, 1st Sess (2007). Available at: http://ftp.resource.org/gpo.gov/hearings/110h/35772.pdf. Accessed February 8, 2011.

20. *Insuring Bright Futures: Improving Access to Dental Care and Providing a Healthy Start for Children.* Hearing Before the Subcommittee on Health of the Committee on Energy and Commerce, House of Representatives, 110th Cong, 1st Sess (2007). Available at: http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_house_hearings&docid=f:39877.pdf. Accessed February 8, 2011.

21. Oregon State Dental Association. Workforce—state of the states: July 13, 2010. Available at: http://oregondental.org/files/members/State%20of%20the%20States%20-%20Workforce.pdf. Accessed February 9, 2011.

22. Pew Center on the States. The Minnesota story: how advocates secured the first state law of its kind expanding children's access to dental care. Available at: http://www.pewcenteronthestates.org/uploadedFiles/Minnesota_Story_brief.pdf?n=8376. Published September 2010. Accessed February 8, 2011.

23. Jordan D. Dental therapists: a community solution to the oral health care crisis. The Community Catalyst Blog. Available at: http://blog.communitycatalyst.org/index.php/2010/11/17/dental-therapists-a-community-solution-to-the-oral-health-care-crisis. Published November 17, 2010. Accessed February 8, 2011.

24. RTI International. Research shows dental health aide therapists provide safe care to rural Alaskan populations [press release]. Research Triangle Park, NC: RTI International; October 26, 2010. Available at: http://www.rti.org/news.cfm?nav=6&objectid=E8C45779-5056-B100-31789DF18DD0E2F7. Accessed February 8, 2011.

25. American Dental Hygienists' Association. ADHA applauds W.K. Kellogg Foundation report evaluating the use of dental health aide therapist workforce model in Alaska [press release]. Chicago, IL: American Dental Hygienists' Association; October 28, 2010. Available at: http://www.adha.org/media/releases/10282010_Kellogg.htm. Accessed June 16, 2011.

26. American Association of Public Health Dentistry. Resolution on the need for formal demonstration programs to improve access to preventive and therapeutic oral health services. Available at: http://www.aaphd.org/default.asp?page=resolutions/Oral%20Health%20Services%20Resolution.htm. Published May 3, 2005. Accessed June 16, 2011.

27. American Public Health Association. Support for the Alaska dental health aide therapist and other innovative programs for underserved populations. Available at: http://www.apha.org/advocacy/policy/policysearch/default.htm?id=1328. Published November 8, 2006. Accessed June 16, 2011.

28. Association of State and Territorial Dental Directors. The dental public health infrastructure: failing to meet the needs of the underserved. Available at: http://www.astdd.org/docs/HCRIssue-Brieffinal4.1.2009IINVinfo.pdf. Accessed June 17, 2011.

29. Health Resources and Services Administration, US Department of Health and Human Services. Shortage designation: health professional shortage areas and medically underserved areas/populations. Available at: http://bhpr.hrsa.gov/shortage. Accessed February 9, 2011.

30. Okwuje I, Anderson E, Valachovic RW. Annual ADEA survey of dental school seniors: 2008 graduating class. *J Dent Educ.* 2009;73(8):1009–1032.

31. American Dental Association. ADA position on the dental health aide program in Alaska. Available at: http://www.ada.org/sections/about/pdfs/position_dentalaide_alaska.pdf. Accessed February 9, 2011.

32. Academy of General Dentistry. White paper on increasing access to and utilization of oral health care services. Chicago, IL: Academy of General Dentistry; 2008. Available at: http://www.agd.org/files/newsletter/7025accesstocarewhitepaper7-31-08.pdf. Accessed February 9, 2011.

33. American Academy of Pediatric Dentistry. Position paper: American Academy of Pediatric Dentistry analysis and policy recommendations concerning mid-level dental providers. Available at: http://www.aapd.org/upload/news/2009/3648.pdf. Accessed February 9, 2011.

34. American Academy of Pediatric Dentistry. AAPD responds to Kellogg study of Alaska dental health aide therapist program [press release]. Chicago, IL: American Academy of Pediatric Dentistry; October 27, 2010. Available at: http://www.aapd.org/media/pressreleases.asp?NEWS_ID=1224. Accessed February 9, 2011.

35. Homer BL. Midlevel providers [letter]. *Am Dent Assoc News.* October 18, 2010. Available at: http://www.ada.org/4902.aspx. Accessed June 17, 2011.

36. Mayher VC Jr. Open letter to the editor of the *Journal of the American Dental Association. AGD Impact.* 2008;36(5):48.

37. National Dental Association. Position paper: access to care and mid-level providers for underserved communities. Washington, DC: National Dental Association; 2010.

38. Casamassimo PS. Don't confuse an agenda with a solution: why dental therapists won't do much to improve access. *Pediatr Dent.* 2010;32(2):96–98.