

SUPPLEMENT ARTICLE

Training new dental health providers in the United StatesBurton L. Edelstein, DDS, MPH^{1,2}¹ Section of Social and Behavioral Sciences, Columbia University College of Dental Medicine² Children's Dental Health Project**Keywords**

dental workforce; dental therapist; mid-level dental providers.

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Abstract

Objectives: Introduction of dental therapists in the United States involves a wide range of issues including permissive governmental policymaking; determinations of their education, supervision, and deployment; their acceptance by dentists and the public; financing of their services; and, most fundamentally, their training. This contribution re-releases and updates the executive summary of an extensive report comparing therapists' training across five industrialized countries and comparing therapists' training to that of conventional U.S. dental providers.

Methods: Literature reviews, web searches, key informant interviews, and program document reviews.

Results: Internationally, three-year training programs that dually qualify trainees as hygienists and therapists dominate. There are marked differences between non-US and US-based therapist training programs and between US-based programs. Reported goals of establishing dental therapists include expanding the availability of basic dental services to underserved disadvantaged subpopulations; potentially reducing costs of basic care; and enhancing the roles of dentists in providing the most sophisticated care, serving the most complex patients, and managing an expanded dental team. Criteria for establishing training programs include program length, supervisory arrangements, recruitment and incentives, deployment, educational costs, curriculum, oversight, and accreditation.

Conclusion: International experiences can well inform US policy on training of dental therapists.

Introduction

Between May 2009 and December 2010, the author undertook a study of dental therapist training in developed countries (1). That descriptive study provides the names and affiliations of dental therapy training programs in Australia, Canada, Great Britain, The Netherlands, New Zealand, and the United States. It provides comparative information based on interviews with program officials, web searches, peer reviewed publications, and, where available, English-language curricular materials. Findings were vetted with key informants prior to the report's release and updated in June 2010 based on responses by readers. Information is provided on each program's duration, degrees granted, and course distributions across biomedical, socio-behavioral, and clinical topics. The work also compares therapists' education with dental education in the United States and provides a histori-

cal review of Congressional action on dental therapists. For orientation, the final publication additionally includes a description of existing and proposed dental care providers, both in the United States and internationally, together with a taxonomy of dental procedures, indicating which procedures have been maximally delegated, or proposed for delegation, to various providers (see Table 1). Dental care providers are categorized as "U.S. conventional," which include dentists, dental hygienists, and dental assistants, "U.S. unconventional," which include the Dental Health Aide Therapist and the two Minnesota Dental Therapists, "U.S. proposed," which include the Community Dental Health Coordinator, the Advanced Dental Hygiene Practitioner, and the Oral Preventive Assistant, and "conventional non-U.S. providers," which references the dental therapist. A concluding section provides information on trainee recruitment, curricula, and program length, together with a discussion of implications for dental

Table 1 Scope of Dental Services Delivered by Traditional and Proposed Dental Providers

Provider type	Advanced restorative care	Diagnosis and treatment planning	Basic restorative care	Preventive care including cleaning below gum line	Preventive care including coronal polishing
Dentist					
Dentist	X	X	X	X	x
Combination dental therapist/dental hygienists					
ADHP		X	X		x
MN Advanced DT		Limited	X		x
DH/DT International		Variable	X	X	X
Dental therapists					
DT International		Variable	X		X
AK-DHAT		Limited	X		X
MN Basic DT			X		X
Dental hygienists					
DH				X	X
Exp function DH			Partial	X	X
Dental assistants					
DA			Partial		X
Exp function DA					Variable
Community dental health coordinator					
CDHC					X

ADHP, Advanced Dental Hygiene Practitioner; MN, Minnesota; DT, Dental Therapists; DH, Dental Hygienists; DA, Dental Assistants; CDHC, Community Dental Health Coordinator.

therapy training in the United States. The intent of the work is to provide all interested parties with objective information that may inform consideration of training dental therapists in the United States. This journal contribution reprints the study's executive summary with modifications that reflect reviewer's comments.

Actions and positions taken by the government (2,3) and by the dental professions (4-6), to increase the availability of dental care for underserved populations evidence an accelerating interest in developing new dental care providers in the United States. Over recent years, many states have significantly expanded their scopes of practice for dental hygienists and dental assistants, thereby allowing both to perform an increasing range of "expanded duties" (7). "Dental therapists" were independently established under federal authority in Alaskan Native areas in 2003 (8) and under state authority in Minnesota in 2009 (9). These primary care dental providers deliver services that were previously delivered in the United States only by dentists. Congress and the US Department of Health and Human Services have similarly paved the way for new dental care providers by mandating studies from the Government Accountability Office and the Institute of Medicine and by authorizing in the health reform law a national dental workforce demonstration program that allows development and study of dental therapists where allowable by state practice acts. At the same time, professional associations representing dentists and hygienists have each promoted their own conceptual models for new mid-level practitioners (10,11). As policymakers consider introducing dental thera-

pists in the United States, one source of potentially useful information is the training experience in other countries. However, an understanding of therapists' training in other countries first requires an appreciation of dental care providers and dental procedures that may be delegatable to non-dentists.

Taxonomy of dental providers

Conventional dental providers in the United States, are dentists, both generalists and specialists; dental hygienists who provide preventive services customarily in association with dentists; and dental assistants whose roles in delivering direct patient care vary considerably across states.

New dental care providers in the United States include the Alaska Dental Health Aide Therapists (DHAT) who are already deployed, and the two types of Minnesota Dental Therapists whose training programs are now underway. Each of the three therapists' scopes of practice differ by procedure, extent of procedure, and terminology but generally include many preventive services, basic dental repair services, and selective tooth extractions (Table 1).

Additional new providers being developed by dental organizations include the American Dental Association (ADA)'s Community Dental Health Coordinator, which is envisioned to provide limited preventive and palliative care and extensive care coordination services, and the American Dental Hygienists' Association's Advanced Dental Hygiene

Practitioner (ADHP), which is envisioned as a highly trained analog to the medical nurse practitioner.

Conventional mid-level dental providers in other advanced and developing countries are the dental therapists who typically provide extensive care for children and limited care for adults, and dental hygienist–therapists who are dually trained to provide preventive dental hygiene services for children and adults and dental repair services primarily for children.

Dental therapists, first instituted in New Zealand in 1921 to serve children through a universal school-based dental delivery system, are today deployed in more than 50 countries. Countries with advanced dental care systems, including Great Britain, The Netherlands, Australia, New Zealand, and, to a more limited degree, Canada, have institutionalized these primary care providers (12). Unsuccessful efforts to establish dental therapists in the United States (1) date back to 1949 in Massachusetts, 1969 at Howard University, 1972 at the University of Kentucky, and, most extensively, from 1972 to 1974 at the Harvard-affiliated Forsyth Dental Center in Boston (13). This “Forsyth Experiment” verified the quality, patient acceptance, cost effectiveness, and productivity of dental therapists, but program advocates were unsuccessful in maintaining legislative authority to sustain the program. It was not until this decade when therapists were deployed under tribal authority in Alaska and sanctioned under state authority in Minnesota that dental therapy was officially instituted in the United States.

Coordination across providers

States, through their dental practice acts and boards of dentistry, have established a variety of delegation and supervision arrangements to ensure care quality, patient safety, and coordination among providers. These range from “direct” and “indirect” supervision, which require the dentist’s physical presence or physical availability, to “prescriptive” and “collaborative” arrangements, which support delivery of dental services by non-dentists in more independent or isolated locales. Teledentistry and advancements in health information technology are today blurring and expanding these traditional relationships.

Both patient and procedural complexity often require that treatment be delivered by a dentist as the most advanced dental practitioner. Patients with complex medical, developmental, or behavioral conditions require a dentist’s care regardless of the complexity of their treatment needs. Similarly, even the most basic procedures may present complexity that requires management by providers with the most advanced training. When such complexity arises unexpectedly, whether requiring a non-dentist provider to engage a dentist or a dentist to engage a dental specialist, treatment is temporized and the patient is referred. All who provide direct

patient care must be competent and prepared to provide emergency medical services should a need arise during the provision of care.

Dental procedures and their delegation

To understand the roles and responsibilities of various dental care provider types requires familiarity with the range of dental procedures. The vast majority of dental procedures addresses one of two diagnoses: tooth decay and periodontal disease. Dental providers are additionally responsible for identifying and treating or referring a wide range of oral pathologies including oral cancer, infections, developmental disturbances, and traumatic injuries. Dental procedures are typically classified as “diagnostic,” “preventive,” “basic restorative,” and “advanced restorative.”

In the United States today, clinical diagnosis remains the sole purview of dentists whose extensive training in biomedical, socio-behavioral, and clinical sciences establishes uniquely expert competencies. Non-dentist providers commonly obtain information (e.g., history, radiographs, photographs, initial dental and periodontal charting, and dental impressions) used by dentists in establishing diagnoses and plans of treatment. Visual identification of cavities and other common oral pathologies has long been within the purview of dental hygienists in the United States and dental therapists in other countries.

State practice acts vary widely in distributing authority to deliver preventive services across dentists, hygienists, and assistants including cleaning of teeth, placement of dental sealants, and application of topical preventive agents. Some states additionally authorize the independent or collaborative practice of dental hygiene, particularly in safety-net settings.

Basic restorative care was once the sole responsibility of dentists. It is now shared in many states with Expanded Function Dental Assistants and Expanded Function Dental Hygienists who can deliver most elements of basic restorative care except procedures that are not inherently reversible, including soft tissue surgery, “drilling” teeth, and extracting teeth. Advanced restorative care – including crowns, bridges, dentures, root canal treatments, advanced periodontal procedures, complicated extractions, and biopsies – remains the exclusive responsibility of dentists, facilitated by dental assistants.

New to the United States is the authority granted to dental therapists to deliver select irreversible procedures including “drilling” and selective extraction of teeth. This significant change allows therapists to be deployed through a prescriptive or collaborative arrangement with a supervising dentist. The proportion of procedures now delivered exclusively by dentists that could potentially be delegated to dental therapists is substantial: 75 percent for general dentists and 79

percent for pediatric dentists, based on American Dental Association survey data (14). However, British studies suggest that less care is routinely delegated to dental therapists (15), due in part to patient and procedural complexity.

Table 1 summarizes the categories of procedures that are now maximally delegable to various mid-level dental providers in the United States and internationally.

Training of dental providers: US and international

US dentists are educated in post-baccalaureate doctoral programs at more than 50 dental schools accredited by the American Dental Association's Council on Dental Accreditation (CODA). The majority of graduates enter directly into practice (60 percent). Others pursue additional training in general or specialty dentistry. While dental education programs are almost universally 4 years in duration, clock hours of instruction and distribution of teaching across the three domains of study—biomedical, socio-behavioral, and clinical—vary considerably (16). Dental hygienists also are educated in CODA-accredited institutions, most typically in associate degree programs. A minority of hygienists obtain more advanced degrees. Dental assistants are most often trained on-the-job or in proprietary short-course programs.

The three new US dental therapy programs differ from one another, with the Alaska program most consistent with international norms because it was fashioned on New Zealand programs and because the first DHATs were trained in New Zealand. The Alaska program trains high school graduates in a 2-year program that is highly focused on hands-on skills and clinical care. In contrast, the Minnesota dental therapy approaches require variable lengths of collegiate education up to the master's level. The Minnesota approaches are more academic, having been informed by and hosted within institutions that train dentists or dental hygienists. They also provide background appropriate to care of medically complex patients, may be less focused on the attributes of underserved community, and require more time to complete. Like many newer mid-level programs in other countries, one Minnesota program combines dental therapy with prior education in dental hygiene. Programs in Great Britain, The Netherlands, Australia, and New Zealand now prioritize dual 3-year hygiene and therapy training without collegiate level prerequisites, while the single mid-level program in Canada continues to feature the 2-year dental therapy-only approach.

Education requirements proposed for the new mid-levels advanced by the ADA and American Dental Hygienists' Association (ADHA) differ from that of dental therapists. Training for the ADA's Community Dental Health Coordinator is taking place at the University of Oklahoma and the University of California Los Angeles, where high school graduates learn both community health worker skills and preventive and pal-

liative dental procedures in a 1-year program. Training for the ADHA's advanced dental hygiene practitioner is envisioned as a 1- to 2-year master's degree program that prepares graduates in dental hygiene, dental therapy, dental systems management, research, and policy domains.

Goals of establishing dental therapy in the United States

A primary goal of instituting dental therapists and hygienist-therapists in the United States is to expand the availability of basic dental services to socially disadvantaged subpopulations that are now inadequately served. A second goal is to establish a diverse cadre of caregivers whose social, experiential, and language attributes are a better match for targeted underserved populations than those of many current dentists. Entry level education as dental therapists or hygienist-therapists may also promote a career ladder for underrepresented minorities in dentistry.

Furthermore, assuming that care provided by these mid-levels is less costly than care provided by more extensively trained dentists, their implementation may—pending allocation of savings across providers and payers—reduce cost barriers, increase the cost efficiency of dental care systems (including private dental offices), and reduce costs of those public programs that pay at market rates. Widespread availability of dental therapists also holds promise to expand workforce in the dental safety-net of community health centers, school-based programs, and special population programs. Potentially most valuable to dentistry as an advanced healthcare profession is the opportunity to maximize the dentists' expertise in managing the most complex patients and most complex treatments while delegating some routine and basic care to new providers. With greater delegation, dentists may also be well positioned to assume greater roles in screening patients for undiagnosed medical conditions, counseling patients on oral and systemic salutary health behaviors, and managing systems of care that involve both on-site and community-based components.

Policy issues inherent in establishing dental therapists

To address these goals, state legislators and regulators need to determine an appropriate balance between scope of practice and training requirement for dental therapists and hygienist-therapists. Many of the goals articulated above will be unattainable if the scope of practice is too broad and the associated training requirements too extensive. Similarly, if supervision standards are too stringent, opportunities to deploy therapists to areas of greatest need will be curtailed.

Decisions about scope, training, and supervision will influence important policy determinations regarding curricula

and training philosophy, program locations, designation of qualified training institutions, length and cost of training, and accessibility by applicants. These decisions in turn will influence critical determinations regarding certification and licensure of graduates as well as decisions about accreditation. While all dentists, dental hygienists, and the new Minnesota dental therapists are educated in CODA-accredited institutions, physicians' assistants and nurse practitioners in medicine are independently accredited by agencies that are unaffiliated with either allopathic or osteopathic medical schools. Selection of an accrediting agent for dental therapists and hygienist-therapists training programs that is similarly independent of dental school accreditation may significantly influence how dental therapists may function in the United States.

Criteria for developing dental therapist and hygienist-therapist training programs

The following findings from international programs may be considered in developing new training programs for dental therapists in the United States:

- In advanced dental delivery systems that utilize dental therapists, length of training is 2 years for dental therapy alone and 3 years for combined dental therapy and dental hygiene. Dental therapists' training fits within a larger career-ladder structure.
- Supervisory arrangements afford dental therapists sufficient latitude to practice collaboratively with dentists while ensuring that patients and procedures requiring a dentist's expertise are provided by a dentist.
- Trainees are recruited from the general population, with preference for those from underserved populations or committed to care of the underserved and are deployed to areas or populations of greatest need.
- The cost of dental therapy and dental therapy/hygiene education is lower than the cost of educating a dentist because they are trained in less time.
- Curricula stress clinical and socio-behavioral studies that allow for technical proficiency and engagement of underserved populations over biomedical training.
- Training experiences focus on attainment of clinical competency over didactic knowledge and often engage trainees in community-based experiences.
- Social, legal, and financial incentives promote training and deployment of therapists in ways that increase access to basic dental care.
- Oversight and accrediting agencies establish standards specific to dental therapy and dental therapy/hygiene education within the context of comprehensive systems of care.

Conclusion

Training dental therapists in the United States holds promise to expand the availability of basic dental care within larger systems of quality dental care delivery managed by dentists. Doing so can be well informed by long-standing international experience as well as by recent US experience. While introduction of these dental care providers will present challenges both to the dental professions and to the governmental policymakers, thoughtful and collaborative determinations of scope of practice, supervision, deployment, and appropriate educational preparation can help meet the goal of safe, quality, accessible dental care for all who seek it. Additionally, implementation of dental therapists and dental hygiene-therapists in the United States can further advance the dentist as the most sophisticated and expert member of the dental team and as a more central member of the larger healthcare system.

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Conflict of interest

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