

Literature Summary: Effectiveness of Dental Therapy on Improving Health and Dental Access

ALASKA

1. Scott Wetterhall, James D. Bader, Barri B. Burrus, Jessica Y. Lee, Daniel A. Shugars, Evaluation of the Dental Health Aide Therapist Workforce Model in Alaska, Final Report, October 2010

In January 2008, the W.K. Kellogg Foundation, in collaboration with ANTHC, the Rasmuson Foundation, and the Bethel Community Services Foundation, requested that an experienced organization provide an independent, detailed, and objective evaluation of the initial implementation of the Dental Health Aide Therapist (DHAT) program. In this evaluation, we focused on the following five areas:

- ☑ patient satisfaction, oral health–related quality of life, and perceived access to care;
- ☑ oral health status;
- ☑ clinical technical performance and performance measures;
- ☑ record-based process measures and evaluation of clinical facilities; and
- ☑ implementation of community-based preventive plans and programs.

The various indicators that were applied in these case studies to evaluate implementation of this program demonstrate that the five therapists who were included in this study are performing well and operating safely and appropriately within their defined scope of practice. The data indicate that the therapists who were observed are technically competent to perform these procedures within their scope of practice. The patients who were surveyed were generally very satisfied with the care they received from the therapists.

2. Wright, JT, Commentary- Do midlevel providers improve the population’s oral health? JADA 144(1) <http://jada.ada.org> January 2013. NOTE- Dr. Wright was chair of the ADA Scientific Affairs Committee which conducted a rigorous critical review of all papers prior to 2013 about dental therapy. Their conclusions indicated that the studies done to date were relatively weak, albeit positive, and that more research needed to be done but Dr. Wright added this commentary in a response to the review.

The results of a variety of studies indicate that appropriately trained midlevel providers are capable of providing high-quality services, including irreversible procedures such as restorative care and dental extractions. What is less clear is whether midlevel providers can provide these services in a cost-effective manner and whether incorporation of these providers into the workforce will result in improvement in the population’s oral health.

3. Donald L. Chi, Dane Lenaker, Lloyd Mancl, Matthew Dunbar, Michael Babb, Dental therapists linked to improved dental outcomes for Alaska Native communities in the Yukon-Kuskokwim Delta. doi: 10.1111/jphd.12263, Journal of Public Health Dentistry 78 (2018) 175–182, ISSN 0022-4006,

Objectives: Dental Health Aide Therapists (DHATs) have been part of the dental workforce in Alaska’s Yukon-Kuskokwim (YK) Delta since 2006. They are trained to provide preventive and restorative care

such as filling and extractions. In this study, we evaluated community-level dental outcomes associated with DHATs.

Methods: This was a secondary data analysis of Alaska Medicaid and electronic health record data for individuals in Alaska's YK Delta (2006-2015). The independent variable was the number of DHAT treatment days in each community. Child outcomes were preventive care, extractions, and general anesthesia. Adult outcomes were preventive care and extractions. We estimated Spearman partial correlation coefficients to test our hypotheses that increased DHAT treatment days would be associated with larger proportions utilizing preventive care and smaller proportions receiving extractions at the community-level.

Results: DHAT treatment days were positively associated with preventive care utilization and negatively associated with extractions for children and adults ($P < 0.0001$). DHAT treatment days were not associated with increased dental treatment under general anesthesia for children.

Conclusions: **Dental therapists are associated with more preventive care and fewer extractions.** State-level policies should consider dental therapists as part of a comprehensive solution to meet the dental care needs of individuals in underserved communities and help achieve health equity and social justice.

4. Donald L. Chi, Lloyd Mancl, Scarlett Hopkins, Cameron L. Randall, Eliza Orr, Ellen Zahlis, Matthew Dunbar, Dane Lenaker and Michael Babb, Supply of care by dental therapists and emergency dental consultations in Alaska native communities in the Yukon-Kuskokwim delta: a mixed methods evaluation. Community Dental Health (2020) 37, 190–198, 10.1922/CDH_00022Chi09

Objectives: Examine the relationship between supply of care provided by dental therapists and emergency dental consultations in Alaska Native communities. Methods: Explanatory sequential mixed-methods study using Alaska Medicaid and electronic health record (EHR) data from the Yukon-Kuskokwim Health Corporation (YKHC), and interview data from six Alaska Native communities. From the Medicaid data, we estimated community-level dental therapy treatment days and from the EHR data we identified emergency dental consultations. We calculated Spearman partial correlation coefficients and ran confounder-adjusted models for children and adults. Interview data collected from YKHC providers ($N=16$) and community members ($N=125$) were content analysed. The quantitative and qualitative data were integrated through connecting. Results were visualized with a joint display.

Results: **There were significant negative correlations between dental therapy treatment days and emergency dental consultations for children (partial rank correlation = -0.48; $p < 0.001$) and for adults (partial rank correlation = -0.18; $p = 0.03$).** Six pediatric themes emerged: child-focused health priorities; school-based dental programs; oral health education and preventive behaviors; dental care availability; healthier teeth; and satisfaction with care. There were four adult themes: satisfaction with care; adults as a lower priority; difficulties getting appointments; and limited scope of practice of dental therapy.

Conclusions: **Alaska Native children, and to a lesser extent adults, in communities served more intensively by dental therapists have benefitted.** There are high levels of unmet dental need as evidenced by high emergency dental consultation rates. Future research should identify ways to address unmet dental needs, especially for adults.

5. Courtney M Hill, Ellen W MacLachlan, Lloyd A Mancl, Dane Lenaker, Donald L Chi, Secular trends in dental services provided by dental therapists and dentists in Southwest Alaska. *J Am Dent Assoc.* 2022 Dec;153(12):1145-1153. doi: 10.1016/j.adaj.2022.08.012. Epub 2022 Oct 12. PMID: 36241553 DOI: 10.1016/j.adaj.2022.08.012

Background: The goal of the study was to identify secular trends in dental service delivery between dental therapists and dentists in the Yukon-Kuskokwim Delta region of Southwest Alaska, the first area of the United States to authorize dental therapy practice.

Methods: Electronic health record transactions from the Yukon-Kuskokwim Health Corporation from 2006 through 2015 (n = 27,459) were analyzed. Five types of dental services were identified using Current Dental Terminology procedure codes: diagnostic, preventive, restorative, endodontic, and oral surgery. Main outcomes were percentages of services provided by dental therapists compared with dentists and population-level preventive oral health care.

Results: The overall number of diagnostic, preventive, and restorative services in the Yukon-Kuskokwim Delta increased. For diagnostic services, there was a 3.5% annual decrease observed for dentists and a 4.1% annual increase for dental therapists (P < .001). Similar trends were observed for restorative services. For preventive services, there was no change for dentists (P = .89) and a 4.8% annual increase for dental therapists (P < .001). Dental therapists were more likely than dentists to provide preventive care at the population level.

Conclusions: Dental therapists have made substantial contributions to the delivery of dental services in Alaska Native communities, particularly for population-based preventive care.

Practical implications: The study's findings indicate that there is a role for dental therapy practice in addressing poor access to oral health care in underserved communities.

6. Donald L Chi , Scarlett Hopkins, Ellen Zahlis , Cameron L Randall , Kirsten Senturia , Eliza Orr , Lloyd Mancl , Dane Lenaker. Provider and community perspectives of dental therapists in Alaska's Yukon-Kuskokwim Delta: A qualitative programme evaluation, *Community Dent Oral Epidemiol.* 2019 Dec;47(6):502-512. doi: 10.1111/cdoe.12492. Epub 2019 Aug 29. PMID: 31464356 DOI: 10.1111/cdoe.12492

Objectives: Dental therapists deliver preventive and basic restorative care and have been practicing since 2006 in Alaska's Yukon-Kuskokwim (YK) Delta. In this qualitative programme evaluation, we documented health providers' and community members' experiences with dental therapy. The goal of the evaluation was to develop a conceptual model of dental care delivery in Alaska Native Communities centered on dental therapists.

Methods: We developed semi-structured interview scripts and used snowball sampling to recruit 16 health providers with experience providing care in the YK Delta and 125 community members from six YK Delta Communities in 2017 and 2018. The six communities were a stratified convenience sample based on community-level exposure to dental therapists (high, medium and no exposure). Interview data were digitally recorded, transcribed, verified for accuracy and coded inductively into conceptual domains using content analytic methods.

Results: Providers believed individuals living in the YK Delta have benefited from clinic-based restorative care and community-based education provided by dental therapists. The restricted scope of dental therapy practice limits the complexity of care that may be offered to patients. However, **community members expressed high satisfaction with the quality of care provided by dental therapists. Community members noted more widespread knowledge and evolving norms about oral health and believed dental therapists are helping to prevent disease and improve quality of life. Participants believed access to dental care for children has improved over the years, but felt that many adults in the YK Delta continue to have unmet needs.** A potential barrier to sustained programme effectiveness is low retention of dental therapists in the region, driven primarily by reports that dental therapists feel overworked, stressed and geographically isolated.

Conclusions: **Dental therapists have contributed to the dental care delivery system in Alaska's YK Delta.** Future opportunities remain within the system to address the needs of adults, develop strategies to retain dental therapists in the region and incorporate evidence-based, prevention-oriented strategies to improve oral health behaviours and reduce oral diseases.

MINNESOTA

1. Blue CM, Kaylor MB. Dental therapy practice patterns in Minnesota: a baseline study. *Community Dent Oral Epidemiol.* 2016; 44:458-66.

Objectives: A chronic shortage of dentists, the importance of oral health, and the lack of access to care led to the introduction of a new oral health practitioner in Minnesota, the dental therapist. Dental therapy graduates from the University of Minnesota have been in practice since 2012. To date, there has been no formal study of how they have been incorporated into dental practice. The purpose of this study was to obtain baseline knowledge of dental therapists' practice patterns in Minnesota and determine if dentists' patterns of work changed after a dental therapist was employed.

Methods: Four dental practices were sampled purposefully to obtain various practice types and geographic locations within Minnesota. Secondary data were collected from practice management software databases in each practice between January-March, 2015. Data were used to describe the work undertaken by dental therapists, the types of patients seen and payer mix. Additionally, data from 6 months before and after employment of the dental therapist were collected to determine whether dentists' practice patterns changed after a dental therapist was employed.

Results: Dental therapists were employed full-time, seeing an average of 6.8 patients per day. No distinct pattern emerged with regard to ages of patients seen by dental therapists. Dental therapists saw up to 90% of uninsured patients or patients on public assistance. Restorative services across practices comprised an average of 68% of work undertaken by dental therapists. Dentists delegated a full range of procedures within the dental therapy scope of practice indicating trust and acceptance of dental therapists. Dentists in two practices began to take on more complex dental procedures after a dental therapist joined the practice.

Conclusion: **Dental therapists are treating a high number of uninsured and underinsured patients, suggesting that they are expanding access to dental care in rural and metropolitan areas of Minnesota. Dentists appear to have an adequate workload for dental therapists and are delegating a**

full range of procedures within their scope of practice. Dentists performed fewer restorative and preventive procedures after a DT was hired.

2. Langelier M, Surdu S, Moore J. The Contributions of Dental Therapists and Advanced Dental Therapists in the Dental Centers of Apple Tree Dental in Minnesota. Rensselaer, NY: Center for Health Workforce Studies, School of Public Health, SUNY Albany; August 2020.

This was a very complex study with great details about productivity. The interested reader is encouraged to read the entire study to better appreciate the contributions of dental therapists to helping Apple Tree increase its mission.

This study examines encounter data that include more than a quarter of a million encounters for 76,342 patients obtaining care in one of the 7 dental centers operated by Apple Tree Dental in Minnesota. Data from Apple Tree's mobile program was excluded from this study. **The study findings suggest that, at a minimum, capacity to provide services has increased across the organization, due in part to new workforce and, as a result, access to dental services at Apple Tree Dental has increased.** A previous study in Minnesota of other providers employing dental therapists found that dental therapists in those practices were expanding access to dental services in both rural and metropolitan areas of the state. The number of patients and clinicians in the Apple Tree Dental centers increased concomitant with the introduction of dental therapists to the organization.

3. Hawazin W. Elani, ; Elizabeth Mertz, Ichiro Kawachi, [Comparison of Dental Care Visits Before and After Adoption of a Policy to Expand the Dental Workforce in Minnesota](#). JAMA Health Forum. 2022

IMPORTANCE Currently, 13 states and tribal nations have expanded their dental workforce by adopting use of dental therapists. To date, there has been no evaluation of the influence of this policy on dental care use.

OBJECTIVE To assess changes in dental care use in Minnesota after the implementation of the policy to authorize dental therapists in 2009.

DESIGN, SETTING, AND PARTICIPANTS In this cross-sectional study of 2 613 716 adults aged 18 years and older, a synthetic control method was used to compare changes in dental care use after the authorization of the policy in Minnesota relative to a synthetic control of nonadopting states. Data from the Behavioral Risk Factor Surveillance System from 2006 to 2018 were analyzed. Data analysis was conducted from June 1, 2021, to December 18, 2021.

EXPOSURE Authorization of dental therapy.

MAIN OUTCOMES AND MEASURES Self-reported indicator for whether a respondent had visited a dentist or a dental clinic in the past 12 months.

RESULTS Among 2 613 716 adults aged 18 years or older, the mean (SD) age at baseline was 46.0 (17.7) years, 396 501 were women (weighted percentage, 51.3%), 503 197 were White (weighted percentage, 67.9%), 54 568 were Black (weighted percentage, 10.1%), 39 282 were Hispanic (weighted percentage, 14.5%), and 34 739 were other race (weighted percentage, 6.7%). The proportion of adults visiting a dentist before the authorization of dental therapists in Minnesota was 76.2%(95%CI, 75.0%-77.4%) in the full sample, 61.5%(95%CI, 58.4%-64.6%) for low-income adults, and 58.4%(95%CI, 53.0%-63.5%) among Medicaid-eligible adults. Authorizing dental therapists in Minnesota was associated with an increase of 7.3 percentage points (95%CI,

5.0-9.5 percentage points) in dental care use among low-income adults, a relative increase of 12.5%(95%CI, 8.6%-16.4%), and an increase of 6.2 percentage points (95%CI, 2.4-10.0 percentage points) among Medicaid-eligible adults, a relative increase of 10.5%(95%CI, 3.9%-17.0%). In addition, the policy was associated with an increase in dental visits among White adults (low-income sample, 10.8 percentage points [95%CI, 8.5-13.0 percentage points]; Medicaid sample, 13.5 percentage points [95%CI, 9.1-17.9 percentage points]), with no corresponding increases among other racial and ethnic groups in the low-income and Medicaid population.

CONCLUSIONS AND RELEVANCE In this cross-sectional study, expanding the dental workforce through authorization of dental therapists appeared to be associated with an increase in dental visits. In Minnesota, the policy was associated with improved access to dental care among low-income adults overall. However, racial and ethnic disparities in dental use persist.

4.Yuanyuan Laura Luo, Lisa Simon, Katy Leiviska, Danae Seyffer, Bernard Friedland, A survey of dental therapists' practice patterns and training in Minnesota. J Am Dent Assoc. 2021 Oct;152(10):813-821.doi: 10.1016/j.adaj.2021.05.004. Epub 2021 Aug 13. PMID: 34392938 DOI: 10.1016/j.adaj.2021.05.004 Background: Expansion of the dental team may play a role in increasing access to oral health care. In 2009, Minnesota became the first state to formally license dental therapists (DTs).

Methods: The authors surveyed DTs and advanced dental therapists (ADTs) in Minnesota to gain a better understanding of those who enter the profession and their motivation for doing so, as well as to solicit their opinions on the overall structure of dental therapy education and the regulatory aspects of the profession.

Results: The response rate was 53.1%. DTs and ADTs were split on whether a dental hygiene degree should be required. Primary reasons for entering dental therapy included more autonomy and a larger scope of practice. Respondents expressed a desire for broadened prescribing rights. The median annual income was in the \$81,000 through \$90,000 bracket.

Conclusions: Minnesota DTs and ADTs must practice in underserved communities. However, their ability to expand access to oral health care is affected by their licensure requirement, scope of practice, and prescription rights.

Practical implications: Policy makers considering dental therapy legislation must consider educational requirements and scope of practice when crafting state legislation. Broadening the scope of practice may allow for more impactful care for at-risk communities.

5.Self K, Born D, Nagy A. Dental therapy: evolving in Minnesota's safety net. Am J Public Health. 2014 Jun;104(6):e63-8. doi: 10.2105/AJPH.2014.301937. Epub 2014 Apr 17. PMID: 24825234 Free PMC article.

Objectives: We identified Minnesota's initial dental therapy employers and surveyed dental safety net providers' perceptions of dental therapy.

Methods: In July 2011, we surveyed 32 Minnesota dental safety net providers to assess their prospective views on dental therapy employment options. In October 2013, we used an employment scan to reveal characteristics of the early adopters of dental therapy.

Results: Before the availability of licensed dental therapists, safety net dental clinic directors overwhelmingly (77%) supported dental therapy. As dental therapists have become licensed over the past 2 years, the early employers of dental therapists are safety net clinics.

Conclusions: Although the concept of dental therapy remains controversial in Minnesota, it now has a firm foundation in the state's safety net clinics. Dental therapists are being used in innovative and diverse ways, so, as dental therapy continues to evolve, further research to identify best practices for incorporating dental therapists into the oral health care team is needed.

GENERAL OVERVIEW PAPERS ON DENTAL THERAPY

1. Catalanotto, FA, In Defense of Dental Therapy: An Evidence-Based Workforce Approach to Improving Access to Care, J Dent Ed. February 2019, Volume 83, Number 2 Supplement, S7- S15

This article addresses new systems and practice models in community-based dentistry. Its purpose is twofold: to identify strategies and policies that support health equity and access to care; and to identify promising efforts that serve as new models for change in the dental workforce. Dental therapy meets both of these purposes and is the major focus of this article. The fundamental premises explored are threefold. First, the dental care system in the U.S. is broken for many people who then suffer the consequences of poor oral health; this is especially true for racial and ethnic minorities and lower income populations. Second, dental therapy is a proven, safe, high-quality, cost-effective, and ethical way to improve access to oral health care and oral health in general. Third, opposition to dental therapy comes only from the leadership of organized dentistry and is without an evidence base to support objections and criticism. This article reviews each of these three premises in detail. **Based on this review, the article concludes that dental therapy is a safe, high-quality, effective, and ethical approach to improve the oral health workforce, increase access to dental care, and achieve oral health equity.**

2. Elizabeth Mertz, Aubri Kottek, Miranda Werts, Margaret Langelier, Simona Surdu, and Jean Moore, Dental Therapists in the United States Health Equity, Advancing. Med Care 2021;59: S441–S448

Background: Dental therapists (DTs) are primary care dental providers, used globally, and were introduced in the United States (US) in 2005. DTs have now been adopted in 13 states and several Tribal nations.

Objectives: The objective of this study is to qualitatively examine the drivers and outcomes of the US dental therapy movement through a health equity lens, including community engagement, implementation and dissemination, and access to oral health care.

Methods: The study compiled a comprehensive document library on the dental therapy movement including literature, grant documents, media and press, and gray literature. Key stakeholder interviews were conducted across the spectrum of engagement in the movement. Dedoose software was used for qualitative coding. Themes were assessed within a holistic model of oral health equity.

Findings: Health equity is a driving force for dental therapy adoption. Community engagement has been evident in diverse statewide coalitions. National accreditation standards for education programs that can be deployed in 3 years without an advanced degree reduces educational barriers for improving workforce diversity. Safe, high quality care, improvements in access, and patient acceptability have been well documented for DTs in practice.

Conclusion: Having firmly taken root politically, the impact of the dental therapy movement in the US, and the long-term health impacts, will depend on the path of implementation and a sustained commitment to the health equity principle.

3. Mathu-Muju KR. Chronicling the dental therapist movement in the United States. J Public Health Dent. 2011 Fall;71(4):278-88. doi: 10.1111/j.1752-7325.2011.00270.x. Epub 2011 May 31. PMID: 22320286 Review.

There have been three attempts to introduce dental therapists (DTs) to the US dental workforce. This account will review early failed attempts to develop DTs, the recent successful Alaska initiative, the Minnesota legislature's authorization of DTs, state dental associations' deliberations on therapists in the workforce, and the efforts of national advocacy groups, foundations, and state legislatures to promote workforce innovation. It concludes with a discussion of the opposition to therapists from elements of organized dentistry.

4. Brickle CM, Beatty SM, Thoele MJ. Minnesota Extends Oral Healthcare Delivery to Impact Population Health. J Evid Based Dent Pract. 2016 Jun;16 Suppl:68-76. doi: 10.1016/j.jebdp.2016.01.018. Epub 2016 Feb 4. PMID: 27236998

Collaborative leadership and stakeholder engagement have created the concept of dental therapist intraprofessional dental team members who are expanding and extending the reach of oral health care to help meet the public need in Minnesota.

Background and purpose: Partially owing to inadequate access to affordable oral health care, health disparities exist within Minnesota's population with significant numbers of residents lacking access to basic oral health care. Policymakers, advocacy organizations, and dental professionals recommended action to address these issues. In 2009, Minnesota became the first state government in the United States to license 2 levels of practitioners, the dental therapist and the advanced dental therapist to primarily treat underserved patients. The purpose of this article is to explain the evolution of the dental therapist and guide other constituencies toward innovative dental hygiene-based workforce models.

Methods: The evolution and educational preparation of the dental therapist and advanced dental therapist are explained in the context of a unique working relationship between educators, legislators, educational institutions, and the Minnesota Department of Health. Pivotal societal, public health, and legislative issues are described from the initial stages in 2005 until 2014 when early data are emerging regarding the impact of dental therapists.

Conclusions: Dental therapist oral health care providers are working in a variety of settings in Minnesota including community clinics, hospitals, and private practices. As of early February 2014,

there were 32 licensed dental therapists, and 6 of whom also held certifications as advanced dental therapists. Initial public health impacts are positive; research regarding the benefits to the public is in its infancy. Further evaluation of outcomes will ascertain the viability of this new professional

5. 6. Brickle CM, Self KD. Dental Therapists as New Oral Health Practitioners: Increasing Access for Underserved Populations. *J Dent Educ.* 2017 Sep;81(9):eS65-eS72. doi: 10.21815/JDE.017.036. PMID: 28864806

The development of dental therapy in the U.S. grew from a desire to find a workforce solution for increasing access to oral health care. Worldwide, the research that supports the value of dental therapy is considerable. Introduction of educational programs in the U.S. drew on the experiences of programs in New Zealand, Australia, Canada, and the United Kingdom, with Alaska tribal communities introducing dental health aide therapists in 2003 and Minnesota authorizing dental therapy in 2009. Currently, two additional states have authorized dental therapy, and two additional tribal communities are pursuing the use of dental therapists. In all cases, the care provided by dental therapists is focused on communities and populations who experience oral health care disparities and have historically had difficulties in accessing care. This article examines the development and implementation of the dental therapy profession in the U.S. An in-depth look at dental therapy programs in Minnesota and the practice of dental therapy in Minnesota provides insight into the early implementation of this emerging profession. Initial results indicate that the addition of dental therapists to the oral health care team is increasing access to quality oral health care for underserved populations. As evidence of dental therapy's success continues to grow, mid-level dental workforce legislation is likely to be introduced by oral health advocates in other states. This article was written as part of the project "Advancing Dental Education in the 21st Century."