



Health Policy Division, Office of
Rural Health and Primary Care
PO Box 64882
St. Paul, MN 55164-0882
651-201-3838
www.health.state.mn.us



Minnesota Board of Dentistry
2829 University Avenue SE
Suite 450
Minneapolis, MN 55414-3246
612-617-2250
www.dentalboard.state.mn.us

Early Impacts of Dental Therapists in Minnesota

**Minnesota Department of Health
Minnesota Board of Dentistry
*Report to the Minnesota Legislature 2014***

February 2014

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For more information, contact:

Division of Health Policy
Office of Rural Health & Primary Care
Minnesota Department of Health
PO Box 64882
St. Paul, MN 55164-0882
www.health.state.mn.us

Phone: 651-201-3838
Fax: 651-201-3830
TTY: 651-201-5797

Minnesota Board of Dentistry
2829 University Avenue SE
Suite 450
Minneapolis, MN 55414-3246
www.dentalboard.state.mn.us

Phone: 612-617-2250
Fax: 612-617-2260
MN Relay Service for Hearing Impaired: (800) 627-3529

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I. Executive Summary

The 2009 Minnesota Legislature directed the Board of Dentistry (BOD), in consultation with the Minnesota Department of Health (MDH) and the Department of Human Services (DHS), to evaluate dental therapists' impact on the delivery of and access to dental services. Given that dental therapists have only been practicing in Minnesota since mid-2011, this report is an early assessment of this still-emerging profession's impacts in the state.

Background

In 2009, Minnesota became the first state government in the U.S. to authorize the licensing of dental therapists. Minnesota's law created two levels of dental therapist practice – the Dental Therapist and the Advanced Dental Therapist – and required that these providers primarily serve underserved patients.

Methods

Fifteen clinics employing dental therapists participated in the evaluation, from August 2012 through December 2013. The assessment drew on (1) a survey of 1,382 dental therapist patients; (2) interviews with staff at clinics employing dental therapists; (3) clinic administrative data; (4) oral health-related emergency room usage data; and (5) dental therapist licensing data.

Findings

A. Dental therapy workforce

- There were 32 licensed dental therapists in Minnesota as of early February 2014, six of whom also held certifications as advanced dental therapists. Dental therapists work in a variety of settings, including community clinics, hospitals and private practices.
- Since licensing commenced in 2011, four complaints have been filed against dental therapists. Two have been resolved without Board action and two are pending. None have been directly related to patient safety issues. No disciplinary actions have been taken by the Board of Dentistry against dental therapists.

B. Dental therapy services reimbursed by state programs

- Data provided directly by the study clinics indicated that the majority (84 percent) of patients served by dental therapists were enrolled in public health insurance programs.
- Data on dental therapist services and payments were not available from DHS for the study period, as DHS data systems were not yet able to distinguish whether a service was provided by a dentist or a dental therapist.

C. Assessment of impact

- Dental therapists at the study clinics, many working part-time, served 6,338 new patients. On average, 84 percent of these new patients were enrolled in public programs.
- Overall, nearly one-third of all patients surveyed experienced a reduction in wait times for an appointment since the dental therapist was employed, with the impact more pronounced in rural areas.
- Some patients saw a reduction in travel time for their appointment with the dental therapist compared to their last appointment, again most notably in rural areas.

- Preliminary findings suggest that dental therapists may reduce emergency room (ER) use by expanding capacity at dental clinics serving vulnerable populations.
- Clinics report additional impacts of dental therapists, including personnel cost savings, increased dental team productivity, and improved patient satisfaction. The savings to clinics resulting from the lower costs of dental therapists are also allowing clinics to expand capacity to serve more underserved and public program patients.

Evaluation limitations

As the first evaluation of state-licensed dental therapists, this project faced challenges and limitations, including small numbers of dental therapists and patients served, the start-up nature of the field, designing research before practice began, and lack of DHS public programs data.

Conclusions and recommendations

- A. The dental therapy workforce is growing and appears to be fulfilling statutory intent by serving predominantly low-income, uninsured and underserved patients.
- B. Dental therapists appear to be practicing safely, and clinics report improved quality and high patient satisfaction with dental therapist services.
- C. Clinics employing dental therapists are seeing more new patients, and most of these patients are public program enrollees or from underserved communities.
- D. Dental therapists have made it possible for clinics to decrease travel time and wait times for some patients, increasing access.
- E. Benefits attributable to dental therapists include direct costs savings, increased dental team productivity, improved patient satisfaction and lower appointment fail rates.
- F. Savings from the lower costs of dental therapists are making it more possible for clinics to expand capacity to see public program and underserved patients.
- G. Start-up experiences have varied, and employers expect continuing evolution of the dental therapist role.
- H. Most clinics employing dental therapists for at least a year are considering hiring additional dental therapists.
- I. Dental therapists offer potential for reducing unnecessary ER visits for non-injury dental conditions.
- J. With identical state public program reimbursement rates for dentist and dental therapist services, there is not necessarily an immediate savings to the state on each claim paid; however, the differential between DHS rates and clinics' lower personnel costs for dental therapists appears to be contributing to more patients being seen.

Recommendations

- A. Research and evaluation by state government and others must continue to document the growth and development of dental therapy in Minnesota, as more dental therapists and advanced dental therapists enter practice.
- B. Payers should work to develop consistent approaches to identify, enroll and credential dental therapists and advanced dental therapists as providers in their systems.
- C. State government and others should collect best practices and disseminate lessons learned to support prospective employers in more quickly becoming ready to hire dental therapists.

II. Introduction

This report evaluates the early impact of dental therapists, as required in Minnesota Laws 2009, Chapter 95, Article 3, section 31 (see Appendix A). Specifically, the Minnesota Legislature directed the Minnesota Board of Dentistry (BOD), in consultation with the Minnesota Department of Health (MDH) and the Department of Human Services (DHS), to evaluate dental therapists' impact on the delivery of and access to dental services, as follows:

- 1. Information on the number, settings, complaints and disciplinary actions involving dental therapists.**
- 2. Evaluation (in consultation with the Minnesota Department of Health) of dental therapists' impact in terms of patient safety, cost-effectiveness and access to dental services, focusing on five outcome measures.**
- 3. Information (in consultation with the Department of Human Services) on the number and type of dental services performed by dental therapists and reimbursed by Minnesota state health care programs.**

This report addresses items 1 and 2 to the extent possible given the short period of time dental therapists have been practicing in Minnesota. Item 3 is not yet available from the Department of Human Services, however partial estimates on dental services provided by dental therapists through the state's health care programs are included based on interviews with clinics currently employing dental therapists.

III. Background

In 2009, Gov. Tim Pawlenty signed legislation that made Minnesota the first state government in the U.S. to authorize the licensing of dental therapists and the credentialing of advanced dental therapists. This section summarizes the legislation's background, Minnesota's current dental therapy law and scope of practice, and how the profession has developed since the law was passed.

Need

Despite Minnesota's overall high rankings nationally in health generally and oral health specifically, significant disparities exist for the state's low-income residents, people of color and the elderly, with these populations suffering disproportionately from oral diseases. Inadequate access to affordable oral health care is one of the primary factors contributing to these disparities.¹

Significant numbers of Minnesotans lack access to basic oral health care. Over 70 percent of Minnesota counties (62 of 87) are fully or partially designated as Health Professional Shortage Areas (HPSAs) for dental care.² In total, 656,184 Minnesotans live in areas lacking sufficient

¹ Minnesota Department of Health (MDH). *The Status of Oral Health in Minnesota*. St. Paul: MDH; September 2013. Available from: <http://www.health.state.mn.us/oralhealth/pdfs/MNOralHealthStatus2013.pdf>

² Health Professional Shortage Area (HPSA) is a designation given by the Department of Health and Human Services (DHHS) to identify shortages of primary medical, dental or mental health providers within a geographic area, population group or facility. For more information on HPSAs, see the DHHS [Dental HPSA Designation Overview](#) webpage and MDH's [Health Professional Shortage Areas & Medically Underserved Areas/Populations](#) page.

dental clinicians. The state's dentist workforce, like its health workforce overall, reflects the aging of the baby boomers: as of August 2012, nearly half (45 percent) of Minnesota's licensed dentists were 55 years or older.³

Access for low-income Minnesotans is still more challenging, as many dentists do not serve significant numbers of uninsured or publicly insured individuals. In 2012, roughly 75 percent of Minnesota dentists were enrolled as service providers in the state's public health care programs, but an estimated 26 percent of these providers treated only 3 to 20 Medical Assistance (MA) recipients per year, and 10 percent treated only 1 or 2 MA patients per year.⁴ Nearly one third (32 percent) of the dentists surveyed in the state said they do not treat MA recipients at all, or are not accepting new patients.⁵

Policymakers, advocacy organizations and dental professionals have recommended action to address these access issues and the poor health outcomes that result. In Minnesota, the Minnesota Oral Health Plan for 2013-2018 calls for enhancing workforce models and creating new providers, including expanded use of dental therapists.⁶

These calls for action in the oral health sector have occurred within the broader context of major health reform. Minnesota passed landmark health reform legislation in 2008, and health policy and delivery changes have continued since in response to state, federal and market trends. Workforce policy has been integral to these developments, with policymakers and health providers focusing on expanding team care, integrating new providers, and reconfiguring scopes of practice to expand access and address anticipated provider shortages.

Dental therapy law and scope

Following authorizing legislation in 2008, the Minnesota Legislature passed legislation in May 2009 that created two levels of dental therapist practice: the Dental Therapist and the Advanced Dental Therapist (see Appendix B for full statutes).⁷ Under the law, dental therapists and advanced dental therapists in Minnesota practice as part of a dental team to provide educational, clinical and therapeutic services. They are sometimes referred to as "mid-level" providers – akin to nurse practitioners, other Advanced Practice Registered Nurses and physician assistants in medical settings – because their scope of practice falls between other allied dental professionals'

³ Minnesota Department of Health, Office of Rural Health & Primary Care, based on data from the Minnesota Board of Dentistry. *Minnesota Health Workforce Data Reporting Tool: Licensing Board Data*. Available from: <http://www.health.state.mn.us/divs/orhpc/workforce/database/healthsum.cfm>

⁴ State of Minnesota, Office of the Legislative Auditor. *Evaluation Report: Medical Assistance Payment Rates for Dental Services*. St. Paul: Minnesota Department of Health; March 2013. Available from: <http://www.auditor.leg.state.mn.us/ped/pedrep/madentalrates.pdf>

⁵ Ibid. Reasons include insufficient reimbursement (with MA payment rates covering only a small portion of dentists' costs) and concerns that the services covered by MA do not meet standards of care – that is, dentists feel the scope of MA-covered services puts them in the position of either providing less care than is needed, or providing the appropriate care but not being reimbursed for all services provided.

⁶ Minnesota Department of Health, Oral Health Program. *Minnesota Oral Health Plan: Advancing Optimal Oral Health for All Minnesotans, 2013-2018*. St. Paul: MDH; January 2013. Available at: <http://www.health.state.mn.us/divs/hpcd/chp/oralhealth/pdfs/StatePlan2013.pdf>

⁷ Minnesota law also allows expanded functions for dental assistants and dental hygienists, including limited authorization for dental hygienists in certain settings (such as Head Start sites, nursing homes, group homes, and tribal and community clinics) under collaborative practice agreements with dentists. *Minnesota Statutes section 150A.10*. Available at: <https://www.revisor.mn.gov/statutes/?id=150A.10>

scopes and a dentist’s scope.⁸ Minnesota’s dental therapist and advanced dental therapist model builds on the use of dental therapists in 54 countries worldwide, beginning in 1921.⁹ The model was first deployed in the U.S. by the Alaska Native Tribal Health Consortium, which introduced dental health aide therapists under tribal authority in 2005.

Minnesota law defines specific educational, examination and practice requirements for licensed dental therapists and advanced dental therapists. One of the most distinctive is the provision that dental therapists practice in settings serving primarily low-income, uninsured and underserved patients, or in areas designated as Health Professional Shortage Areas (HPSAs) for dental care.¹⁰ The table below summarizes the scope of practice and other requirements for dental therapists and advanced dental therapists. See Appendix B for a more detailed description of the scope of practice defined under Minnesota law.

Table 1. Minnesota requirements for dental therapists

	Educational/ credential requirements	Scope of practice	Level of supervision
<i>Dental therapist</i>	<ul style="list-style-type: none"> ▪ Bachelor’s degree in dental therapy. ▪ Competency and licensure exam. ▪ Jurisprudence examination. 	<p>A licensed dental therapist may perform certain dental services under “indirect supervision.” See Appendix B for a full list of these services.</p> <p>A dental therapist may perform additional services under “general supervision” unless restricted or prohibited from doing so in the collaborative management agreement. See Appendix B for a full list of these services.</p> <p>A dental therapist may also dispense certain medications and supervise up to 4 dental assistants.</p>	<p>Practices under the supervision of a dentist, with whom they must have a collaborative management agreement. Some dental therapy services can be provided under “indirect supervision” (the dentist is on-site and authorizes procedures) and others under “general supervision” (the dentist is not necessarily on-site during procedure but does authorize its performance).</p>
<i>Advanced dental therapist</i>	<ul style="list-style-type: none"> ▪ Dental therapist license. ▪ Master’s degree in advanced dental therapy. ▪ 2,000 hours of clinical practice. ▪ Certification exam for advanced practice. 	<p>An advanced dental therapist certified by the Board of Dentistry may perform the following services and procedures, pursuant to a written collaborative management agreement (and any limitations therein):</p> <ul style="list-style-type: none"> ▪ All services a dental therapist provides (see above). ▪ Oral evaluation and assessment. ▪ Treatment plan formulation. ▪ Routine, nonsurgical extractions of certain diseased teeth. 	<p>Like a dental therapist, the advanced dental therapist practices under the supervision of a dentist, with whom they must have a collaborative management agreement, but all advanced dental therapy services can be provided under “general supervision.” The dentist does not need to see the patient first or be on-site during procedure.</p>

⁸ Other allied dental professionals include expanded-function dental hygienists and dental assistants.

⁹ David A. Nash et al., *A Review of Global Literature on Dental Therapists*. Battle Creek, MI: W.K. Kellogg Foundation. April 2012. Available from: <http://www.wkkf.org/resource-directory/resource/2012/04/nash-dental-therapist-literature-review>.

¹⁰ Minnesota Statutes Sections 150A.105-.106 (2009). See 150A.105, subdivision 8 (Definitions) in Appendix A for full definition of “practice settings that serve the low-income and underserved.”

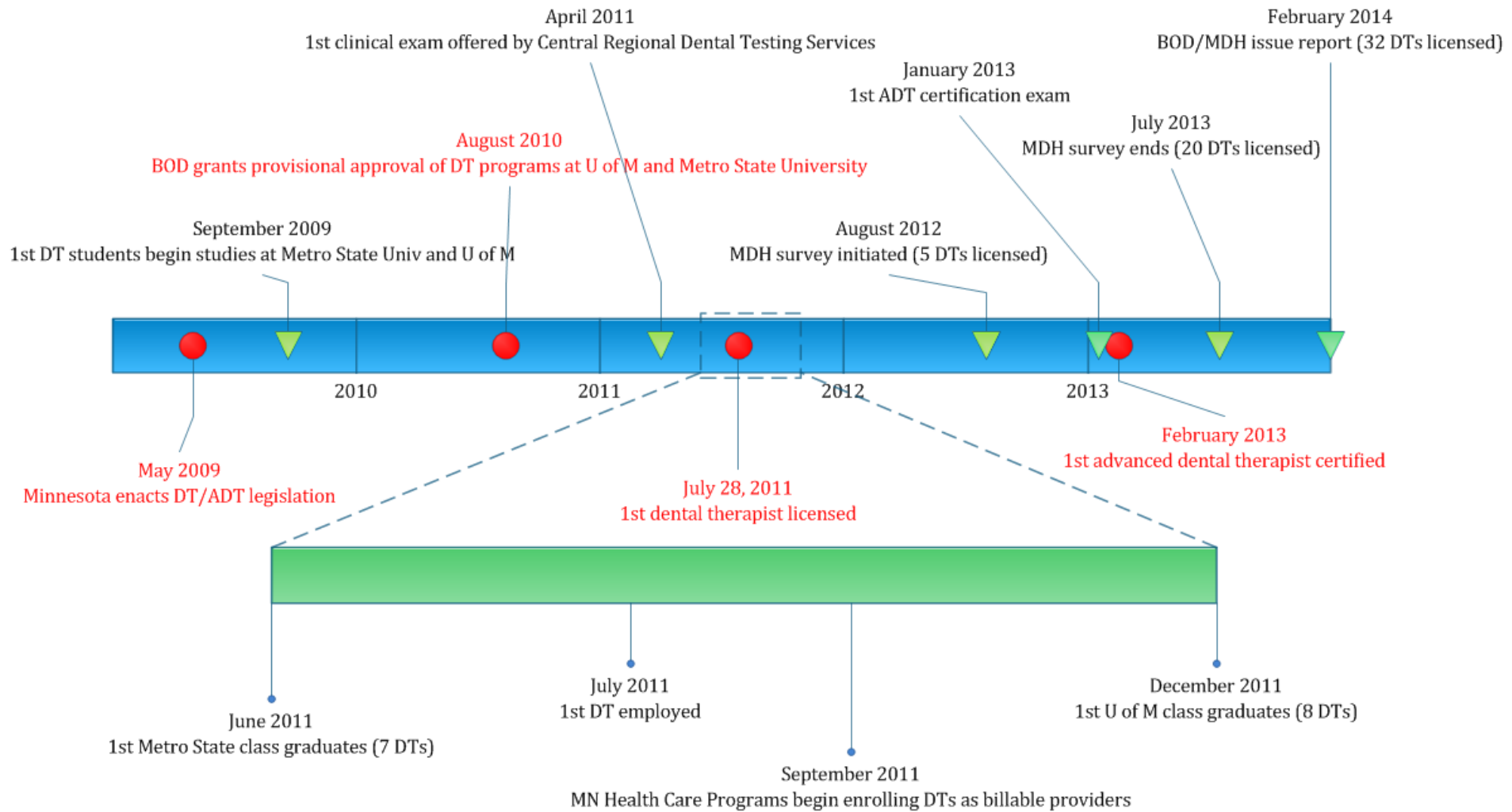
Development of Minnesota's dental therapy profession since 2009

The dental therapy profession is still in its infancy in the U.S., and Minnesota's oral health community has had to build basic foundations of the profession: educational programs and cohorts of students; licensing and certification procedures, materials and exams; collaborative management agreements; reimbursement systems; and changes at the individual clinic level, as dental practices work to understand the new role and integrate it into day-to-day operations and teams.

As a result, the profession is still emerging. As of early February 2014, Minnesota had a total of 32 licensed dental therapists, six of whom were certified as advanced dental therapists. This compares to 4,027 licensed dentists and 5,542 licensed dental hygienists statewide. The enabling legislation was passed in May 2009, and the state issued its first dental therapist license more than two years later, in July 2011 (after the first cohorts of dental therapists had graduated and the Board of Dentistry had established its licensing procedures). The first advanced dental therapist was certified one year ago, in February 2013. The Minnesota Department of Human Services (DHS) began enrolling dental therapists as billable providers in the state's public insurance programs (Minnesota Health Care Programs, which include Medical Assistance and MinnesotaCare) in September 2011. DHS established identical payment rates for dentist and dental therapy services.

Figure 1 illustrates both the progress that has been made in building the occupation and its status as a still-emerging profession.

Figure 1: Timeline, dental therapy in Minnesota since 2009



IV. Methods

To conduct the three-part analysis of dental therapy impact directed by the 2009 Legislature, data were drawn from multiple sources. Fifteen clinics employing dental therapists (the “study clinics”) participated in the evaluation, listed below (see also Appendix D for maps of these clinics):

Table 2: Study Clinics

Clinic Name	City	Location
ADT Dental	Minneapolis	Twin Cities metro
Apple Tree Dental	Coon Rapids	Twin Cities metro
Apple Tree Dental	Madelia	Greater Minnesota
Children's Dental Services	Minneapolis	Twin Cities metro
Community Dental Care	Maplewood	Twin Cities metro
Family Dental Care (part of People's Center Health Services)	Minneapolis	Twin Cities metro
Hennepin County Medical Center	Minneapolis	Twin Cities metro
HealthPartners	Como Clinic	Twin Cities metro
HealthPartners	Coon Rapids	Twin Cities metro
HealthPartners	Midway Clinic	Twin Cities metro
Main Street Dental Care	Montevideo	Greater Minnesota
Metropolitan State University Dental Clinic	Maplewood	Twin Cities metro
Minnesota State Community and Technical College - Moorhead ¹¹	Moorhead	Greater Minnesota
St. Joseph's Community Dental Clinic	Park Rapids	Greater Minnesota
Union Gospel Mission	St. Paul	Twin Cities metro

The following are the specific sources and methods included in the evaluation:

A. Minnesota Department of Health patient survey

MDH designed a survey to capture the impact of dental therapists on the oral health access measures defined in the 2009 dental therapy law (such as reduction in patient wait and travel times). The survey questions were developed by MDH, reviewed by several stakeholders and pilot tested before distribution. A sample of the survey instrument is provided in Appendix C.

MDH recruited 15 clinics employing dental therapists to participate in the survey, 14 of which returned completed surveys.¹² The survey was designed in English and translated into five other languages (Amharic, Hmong, Oromo, Somali and Spanish) in consultation with study sites based on clinic patient population(s).¹³

The surveys were designed to be given to patients at their first appointment with the dental therapist. (There was considerable variation in how study clinics actually administrated the

¹¹ This site did not participate in the survey or data collection, but did participate in the interview portion of the study.

¹² Collaborative management agreements filed with the Minnesota Board of Dentistry were used to identify the first cohort of clinics in Minnesota that hired dental therapists. Minnesota State Community and Technical College – Moorhead did not participate in the survey, but did participate in the interview portion of the evaluation.

¹³ To ensure survey integrity, the surveys were back-translated into English by language experts and reviewed.

surveys. See Evaluation Limitations for more detail.) Patients were encouraged to complete the survey on site and either return it to clinic staff or send it to MDH in a provided postage-paid envelope.

The patient surveys were distributed by the clinics as early as August 2012 at one of the sites, and all sites were instructed to discontinue surveys by mid-July 2013. A total of 1,382 surveys were completed, 55 percent of which were completed by adults and 45 percent on behalf of patients who were children. Of the patients who visited a rural dental clinic, 60 percent were under age 18, while 24 percent of those who visited an urban clinic were under 18 years of age.

B. MDH clinic interviews

MDH conducted interviews with clinic managers/supervisors, supervising dentists and/or dental therapists at each of the participating sites to further assess how the introduction of dental therapists affected key measures including patient flow, oral health team/clinic productivity, clinic costs and patient access.

C. Administrative data from clinics.

MDH also requested that study clinics provide data on the numbers of patients served since hiring a dental therapist. Specifically, each clinic was asked to report the number of patients served by each dental therapist from the time they began employment through the end of the survey (July 2013), the insurance type of those patients and the average number of hours worked by the dental therapist.¹⁴

D. Emergency room data.

To assess the impact of dental therapists on ER usage, the Minnesota Hospital Association provided data on emergency room services for non-injury oral health conditions in 2012.

E. Licensing and other professional data.

The Minnesota Board of Dentistry provided data on the number of dental therapists licensed in Minnesota and the settings in which they were practicing. The Board also provided information on any complaints filed against dental therapists and any disciplinary actions taken in that period. All data are current as of February 4, 2014.

V. Findings: Dental therapy workforce status

The 2009 dental therapy law directed the Board of Dentistry to provide the following information regarding the dental therapy workforce. All data are through January 15, 2014.

A. Number of dental therapists annually licensed since 2011. As of February 4, 2014, there were 32 licensed dental therapists in Minnesota. Of the 32, six also hold certifications in advanced dental therapy. The following table indicates the number of dental therapists by year since licensure began in 2011:

¹⁴ MDH did not receive any patient-related data from Family Dental Care.

Table 3: Number of dental therapists licensed, by year

Year	Number of new dental therapists licensed in Minnesota
2011	6
2012	12
2013	11
2014	3
Total as of February 2014	32

B. Settings where dental therapists are practicing and populations being served. Dental therapists work in a variety of settings. The majority of these settings are in urban underserved areas, but a growing number are located in rural and suburban communities.

Table 4: Dental therapist employers and settings

Dental Therapist License #	Employer Name	City	Location	Employer Type
DT1*	Hennepin County Medical Center (HCMC)	Minneapolis	Twin Cities metro	Hospital
DT2*	Children's Dental Services (CDS)	Minneapolis	Twin Cities metro	Community-based clinic
DT3	ADT Dental/ADT Kids	Minneapolis	Twin Cities metro	Private practice
DT4*	Apple Tree Dental	Mobile (multiple locations)	Multiple locations	Community-based clinic
DT5*	Apple Tree/ Union Gospel Mission (UGM)	Mobile (multiple locations)	Multiple locations	Community-based clinic
DT6*	Family Dental Care (part of People's Center Health Services)	Minneapolis	Twin Cities metro	Community-based clinic/ Federally Qualified Health Center (FQHC)
DT7	University of MN/ Community University Health Care Center (CUHCC) /Community Dental Care	Minneapolis	Twin Cities metro	Community-based clinic/ FQHC
DT8	HealthPartners	Maplewood St. Paul	Twin Cities metro	Health system/HMO
DT9	N/A [†]	N/A [†]	N/A [†]	N/A [†]
DT10	Main Street Dental Care	Montevideo	Greater Minnesota	Private practice
DT11	N/A [†]	N/A [†]	N/A [†]	N/A [†]
DT12	St. Joseph's Community Dental Clinic	Park Rapids	Greater Minnesota	Hospital/Community-based clinic
DT13	Lake Superior	Duluth	Greater Minnesota	Community-based

Dental Therapist License #	Employer Name	City	Location	Employer Type
	Community Health Center			clinic/ FQHC
DT14*	HCMC/Metropolitan State University Dental Clinic	Minneapolis	Twin Cities metro	Hospital/Community-based clinic
DT15	Open Cities Health Center, Inc.	St. Paul	Twin Cities metro	Community-based clinic/ FQHC
DT16	N/A [†]			N/A [†]
DT17	Excel Dentistry	St. Louis Park	Twin Cities metro	Private practice
DT18	UGM/CUHCC/Mission of Mercy [‡] /University of Minnesota	Minneapolis St. Paul	Twin Cities metro	Community-based clinic/ FQHC /Hospital
DT19	Northland Smiles	Deerwood	Greater Minnesota	Private practice
DT20	Woodland Dental	Wadena	Greater Minnesota	Private practice
DT21	Northland Smiles (not Melrose)	Deerwood	Greater Minnesota	Private practice
DT22	Apple Tree Dental	Mobile unit (multiple locations)	Multiple locations	Community-based clinic
DT23	Open Door Health Center	Mankato	Greater Minnesota	Community-based clinic/ FQHC
DT25	Southern Heights Dental Group	Faribault	Greater Minnesota	Private practice
DT26	Family Dental Care (part of People's Center Health Services)	Minneapolis	Twin Cities metro	Community-based clinic/ FQHC
DT27	Metropolitan State University Dental Clinic	Maplewood	Twin Cities metro	Community-based clinic
DT28	Metropolitan State University Dental Clinic/CDS	Maplewood	Twin Cities metro	Community-based clinic
DT 33	N/A [†]	N/A [†]	N/A [†]	N/A [†]
DT 35	Children's Dental Services	Minneapolis	Twin Cities metro	Community-based clinic
DT 36	N/A [†]	N/A [†]	N/A [†]	N/A [†]
DT 37	N/A [†]	N/A [†]	N/A [†]	N/A [†]
DT 38	Children's Dental Services	Minneapolis	Twin Cities metro	Community-based clinic

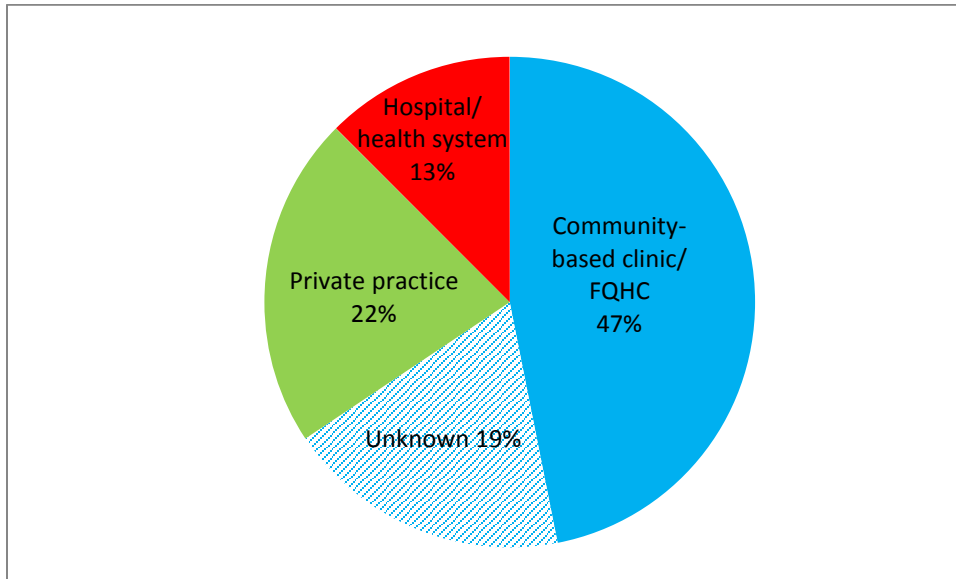
Notes: License numbers not currently assigned to a practicing dental therapist: DT24, DT29, DT30, DT31, DT32, DT34. These numbers were used by the Board of Dentistry for testing purposes only.

* Advanced Dental Therapist certifications.

[†]No Collaborative Management Agreement on file with the Board of Dentistry as of Jan 15, 2014, so no additional information available.

[‡]Mission of Mercy is a one-day annual volunteer event sponsored by the Minnesota Dental Association.

Figure 2. Practice settings of Minnesota dental therapists (N=32)



Administrative data provided by clinics indicated that the majority of the patients served by dental therapists to date are enrolled in public insurance programs (see Findings, below). In the interviews conducted by MDH, study sites also reported an increase in access to oral health services for those traditionally underserved – patients with medical complexities, pregnant women, immigrants, children and seniors.

C. Number of complaints filed against dental therapists and the basis for each complaint.

In 2012, two complaints were filed against dental therapists. Both of these cases have been resolved without Board action. In 2013, two complaints were filed against dental therapists, both of which are pending. None of the complaints have been directly related to patient safety issues.

D. Number of disciplinary actions taken against dental therapists. No disciplinary actions have been taken by the Board against dental therapists.

VI. Findings: Dental therapy services reimbursed by state programs

The 2009 dental therapy law also directed the Board of Dentistry, in consultation with the Minnesota Department of Human Services (DHS), to report “the number and type of dental services that were performed by dental therapists and reimbursed by the state under the Minnesota state health care programs for the 2013 fiscal year.”

At the beginning of the study period (mid-2012), DHS data systems could not distinguish whether a service was provided by a dentist or a dental therapist, so data on dental therapist services and payments were not available. DHS did gain the capacity to directly enroll dental therapists as providers in its fee-for-service programs, but few have been enrolled. DHS is aware that most of its managed care plans are not individually credentialing dental therapists. Likewise, other dental payers have been slow to credential dental therapists, and it appears claims are mostly being submitted under the supervising dentist’s provider identification number.

As a substitute, MDH sought and received information from the study clinics regarding the insurance status of the patients served by dental therapists. These administrative data indicated that the majority of the patients served by dental therapists to date are enrolled in public insurance programs (Minnesota Health Care Programs such as Medical Assistance or MinnesotaCare). Of the 12 clinics that provided information on payers for dental therapy services, the average percentage of dental therapist patients enrolled in public programs was 84 percent.

VII. Findings: Assessment of impact

The 2009 dental therapy law also directed the Board of Dentistry, in consultation with MDH, to develop and report the results of an evaluation process “assessing the impact of dental therapists in terms of patient safety, cost-effectiveness and access to dental services.” Specifically, the evaluation was to focus on five outcome measures:

- A. Number of new patients served.**
- B. Reduction in waiting times for needed services.**
- C. Decreased travel time for patients.**
- D. Impact on emergency room usage for dental care.**
- E. Costs to the public health system.**

Each of these measures is addressed below, with the caveat that this is a preliminary evaluation, given the relatively short period of time that dental therapists have been practicing in Minnesota and the even briefer time advanced dental therapists have been in the field (see also Evaluation Limitations section). The assessment uses a combination of the data sources described in the Methods section above.

A. Number of new patients served.

The total number of new patients served by dental therapists at study clinics since the time the dental therapists were hired (first hired in August 2011) through the end of the survey period (July 2013) was 6,338.¹⁵ The average hours worked by the dental therapist over the survey period¹⁶ ranged from 1 hour/week to 36 hours/week at multiple study sites,¹⁷ which equals approximately seven full-time equivalents (FTEs). At clinics with few dentists, the addition of the dental therapist led to a significant increase in access for new patients directly attributable to the therapist, in one clinic doubling new patients seen. In large clinics with many dentists, dental therapists also expanded access to new patients, but the relative increase has been a smaller share of total clinic patients.

Many of the study clinics also referred to the increase in new patients in their interviews with MDH, and confirmed that this increase was largely attributable to the addition of a dental

¹⁵ Each patient is counted once. Repeat visits to the clinic, and dental therapist services provided at nearby schools, are not included. Children’s Dental Services has significant activity at its clinic and at numerous schools.

¹⁶ Survey period ranges from August 2012 through July 2013.

¹⁷ Many clinics initially hired dental therapists on a part-time basis, increasing hours as routines were established and capacity to accept new patients grew.

therapist. The staff at one clinic, which has seen a 24 percent increase in patients, noted: “The increase in new patients is mostly because of the dental therapist’s productivity. We’ve been able to add a chair¹⁸ to accommodate the clinic’s new patients. Patients want to get in with her.”¹⁹

Many of the clinics noted an increase not just in the overall number of patients, but an increased ability to serve greater numbers of underserved and special populations. Several clinics noted that most of the new patients being seen since the dental therapist started are public program enrollees or are uninsured.²⁰ One rural private clinic hadn’t accepted many Medical Assistance patients before their dental therapist started, but now sees significant numbers.²¹ Clinics noted the dental therapist has expanded their capacity to serve children, and one has added services at a nearby elementary school (which their advanced dental therapist visits three times each week) and another hopes to begin providing pediatric dental therapy services in schools as well.²² A hospital site is using a dental therapist to provide oral health services to low-income pregnant women directly in its OB department. In the past, these patients were referred to the hospital’s emergency room. The dental staff explained these services are only possible because of the dental therapist; the grant-funded program could not afford to employ a dentist.²³

Several clinics noted an ability to serve more medically complex individuals – including more elderly, immigrant and refugee patients – in part because of the cost savings²⁴ they’ve realized through the dental therapist.²⁵ One such clinic plans to begin providing advanced dental therapist home visits to seniors, particularly elderly immigrant patients who live nearby but have difficulty getting to the clinic.²⁶

MDH also requested information from the study clinics regarding the insurance status of the patients served by dental therapists. These administrative data indicated that, on average, 84 percent of the patients seen by dental therapists were on public insurance programs (Minnesota Health Care Programs such as Medical Assistance or MinnesotaCare). This is a slightly higher proportion than the average for all providers at the clinics (76 percent), suggesting that dental therapists are seeing greater numbers of low-income patients than other providers.

B. Reduction in waiting times for needed services.

Overall, nearly one-third of all patients surveyed experienced a reduction in wait times for an appointment since the dental therapist was employed (Figure 3). Over 80 percent of patients

¹⁸ This report uses the term “chair” as the industry shorthand for a dental operator. A dental operator is the treatment room or work area of the dental team. Common operator equipment includes the dental chair, dental unit, dental operating light, x-ray machine, operating stools, mobile carts, and cabinets and tools such as air abrasion cavity preparation systems, lasers, CAD/CAM systems, computers and associated equipment, curing lights, digital radiographic equipment, and intraoral cameras (American Dental Association, ADA CE Online).

¹⁹ Interview with ADT Dental interview.

²⁰ Interviews with Children’s Dental Services; ADT Dental; Apple Tree Dental; Main Street Dental; HealthPartners; and Family Dental Care.

²¹ Interview with Main Street Dental.

²² Interviews with ADT Dental and HCMC.

²³ Interview with HCMC.

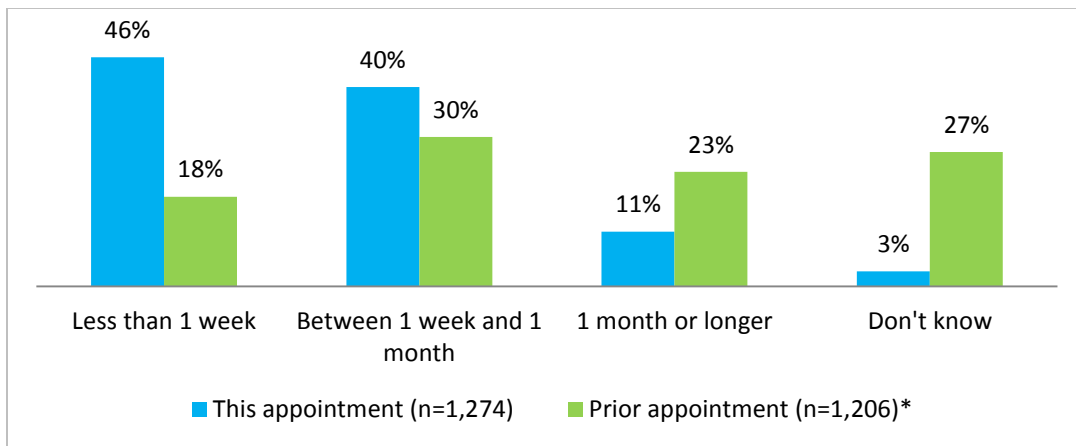
²⁴ See sections VII.E. and VIII.A. for further discussion of dental therapist costs.

²⁵ Interviews with Apple Tree Dental and Family Dental Care.

²⁶ Interview with Family Dental Care.

stated it took less than one month to get their first appointment with the dental therapist. More than 20 percent said they had waited one month or more for a previous appointment (before the dental therapist was available). Of the patients who reported it had taken at least two months to get a previous appointment, 77 percent reported getting the current appointment in less than one month. (As noted in the Limitations section, these survey results may have been affected by the predominance of follow-up visits as the first encounter with a dental therapist. During the interviews, MDH probed for other changes at the study sites [such as additional dentists/hygienists/assistants/operatories] that may have impacted patient wait times, and the interviews confirmed a reduction in wait time attributable to the presence of dental therapists.)

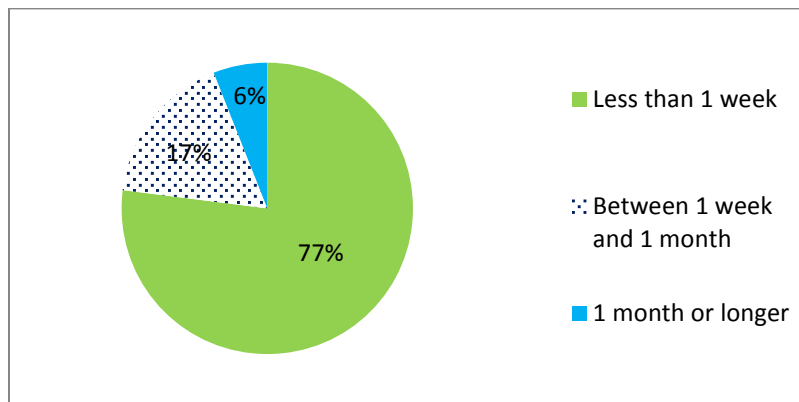
Figure 3. Wait times for appointment, with DT vs. pre-DT



*For 32 patients, this was their first dental appointment, so “prior appointment” question did not apply.

Of note is the short wait time for an appointment when pain or other dental emergency was the presenting problem (Figure 4). Combined with the overall reduction in wait times, this finding is an early indicator of the potential for dental therapists to reduce hospital emergency department use for dental pain. Clinic interviews also yielded similar indicators of a reduction in ER use. This is an issue ripe for future research.

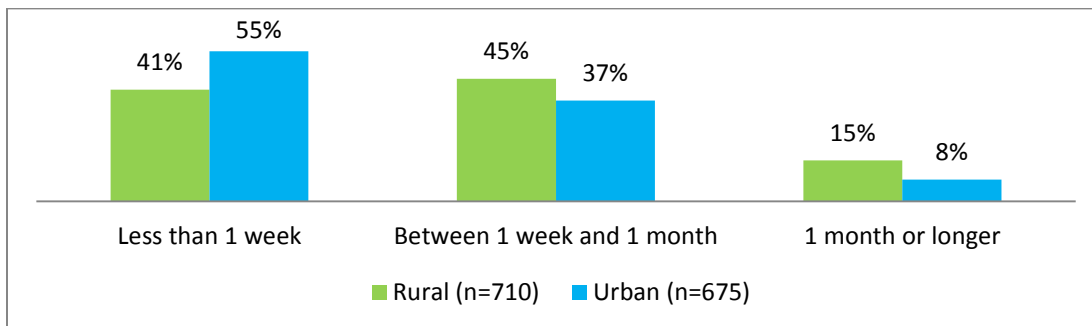
Figure 4. Wait time when reason for visit was for pain or other dental emergency (n=135)



The impact of the dental therapist on wait time appears to be greater in the rural areas (Figure 5). Patients visiting rural clinics were nearly two times more likely to experience a reduction in wait

time compared to their urban counterparts, although it appeared that the wait time was still longer for the current appointment at a rural clinic than it was at an urban clinic.

Figure 5. Wait times for dental therapist appointment, rural vs. urban



The interviews with clinic staff confirmed that having a dental therapist on staff appeared to decrease wait times, with all of the clinics interviewed reporting a reduction in wait times for appointments since hiring a dental therapist. One clinic director said their wait time for an appointment has been reduced from 4 weeks to 1.5 weeks maximum.²⁷ Another noted that children who see the dental therapist are now being scheduled in three weeks (compared to 10 weeks for a dentist).²⁸ Others noted that wait times have decreased particularly for restorative care appointments or more complex treatments, and some noted a drop in appointment failures (no shows) as well.²⁹

The director of a rural community clinic stated they had always had a long waiting list for appointments, but since hiring the dental therapist, there is now no waiting list; the dental therapist eliminated “pages of people who were waiting for appointments.”³⁰ This clinic is in the same facility as the hospital, and because of their expanded capacity with the dental therapist, the hospital is now referring dental emergencies directly to the dental clinic from the emergency room, reducing emergency room use for dental-related care and for drug seeking couched as dental pain.

Clinic staff observed several reasons for this impact on wait times. One clinic explained they can shift patients around in the schedule and get procedures done in a more timely way, because the dental therapist adds flexibility to the teams.³¹ Having a dental therapist gives the care coordinator and scheduler more options. Many cases get done the same day, and the procedure is simpler because the decay has not progressed as it might with a longer wait. One clinic director reported that using the dental therapist also opens up appointment times for the dentist, as many restorative procedures can now be accomplished by the dental therapist instead.³²

²⁷ Interview with Family Dental Care.

²⁸ Interview with HCMC.

²⁹ Interviews with Children’s Dental Services, Apple Tree Dental and Moorhead State Technical and Community College Dental Clinic.

³⁰ Interview with St. Joseph’s Area Health Services-Community Dental Clinic.

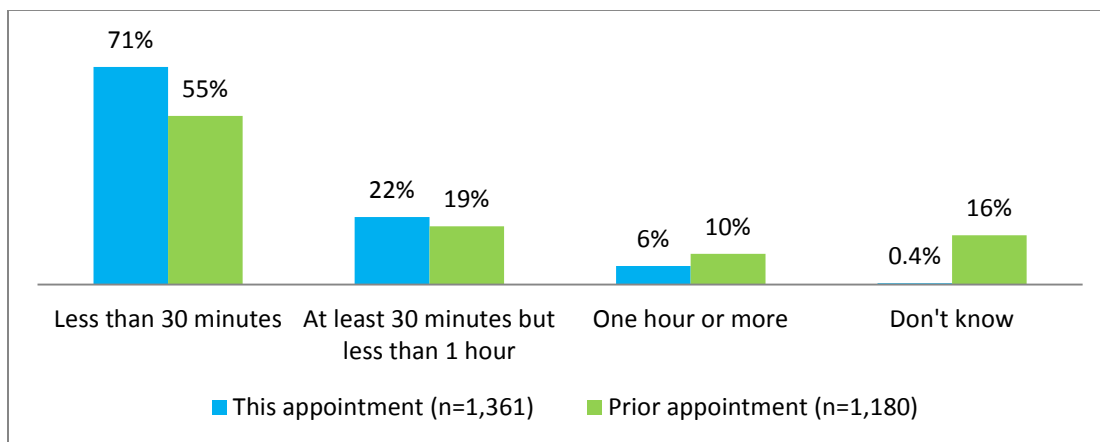
³¹ Interview with Apple Tree Dental.

³² Interview with Moorhead State Technical and Community College Dental Clinic.

C. Decreased travel time for patients.

The survey results indicate that at least for some patients, there was a reduction in travel time for their appointment with the dental therapist compared to their last appointment (Figure 6). For 93 percent of respondents, it took less than one hour to travel to the current dental appointment with the dental therapist, compared to 74 percent who traveled less than an hour to their last appointment. Similarly, a slightly lower percentage (6 percent) of patients had to travel at least an hour to the current appointment, compared to the 10 percent who traveled at least that far to their prior dental appointment. Most of the respondents (94 percent) stated it was somewhat or very easy to get transportation to this appointment.

Figure 6. Travel times for appointment, with dental therapist vs. pre-dental therapist



A reduction in travel time was more pronounced for certain populations. Patients who reported having visited an emergency room in the past two years were nearly twice as likely to experience a reduction in travel time from a previous visit to a dental clinic compared to the current appointment with a dental therapist.³³ Of those patients who had not visited the current dental clinic before, 24 percent experienced a reduction in the time it took to travel to the current dental appointment with the dental therapist.

Geographic location of the clinic also seems to have affected reductions in travel times, with change in travel time more notable in rural areas. Of the respondents who stated they experienced a reduction in travel time, 59 percent were seen at rural clinics and 41 percent at urban clinics.

It should be noted that travel time to a clinic is somewhat confounded by the type of dental insurance a patient has. The closest clinic that takes public program patients may be more than one or two hours away. As an example, one of the study clinics was a single-owner private dental clinic in Montevideo that has significantly increased its share of public programs patients since the hiring of the dental therapist. Many of its patients would have to drive an additional 30 minutes to one hour to be seen by another clinic that takes their insurance.³⁴ In two other cases, clinics have served patients referred from as far away as Iowa and South Dakota; these are the closest clinics that will accept public insurance.

³⁴ Interview with Main Street Dental in Montevideo.

Several of the clinics are using or plan to use dental therapists to address travel barriers more directly, by bringing their services to nontraditional patient settings outside the dental clinic, including elementary schools, medical settings and elderly patients' homes.³⁵

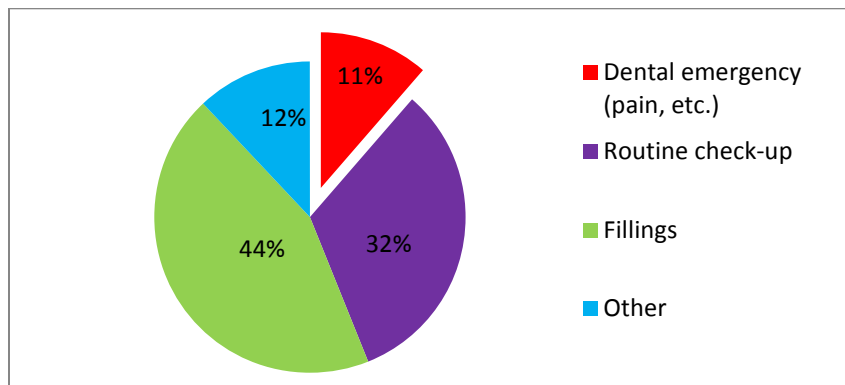
D. Impact on emergency room usage for dental care.

According to the Minnesota Hospital Association (MHA), non-injury oral health-related visits accounted for 28,115 emergency room claims in 2012. The costs for these ER visits totaled \$15,520,215, of which 37 percent (\$5,663,760) was charged to public assistance programs. Dental caries alone accounted for 3,350 of these emergency room claims and \$1,534,678 in charges.³⁶ Adults account for the great majority of these visits; 85 percent of the 2012 ER visits for dental conditions were adults between the ages of 19 and 65.³⁷ As noted above, the current study also found adults who saw a dental therapist were far more likely to have visited an ER in the past two years than children who saw a dental therapist.

It is too early to definitively answer how dental therapists may affect the use of emergency rooms for dental treatment. With only 32 dental therapists in the field (and fewer during the time period of this study), it is difficult to discern their impact on the utilization of the emergency room statewide. However, the survey and interviews conducted in this preliminary evaluation suggest dental therapists may be helping serve patients who have visited the ER in the past for dental issues, and may also be preventing current ER use by expanding capacity at dental clinics serving vulnerable populations that might otherwise resort to the ER.

A relatively small number (11 percent) of patients were seeing the dental therapist for a dental emergency. The great majority (89 percent) had made the appointment for either a routine check-up (32 percent) or other treatment, with fillings accounting for 44 percent of the visits.

Figure 7. Reason for dental visit (n=1,373)



Of the patients visiting a clinic for a dental emergency, 27 percent had tried to get an appointment at another clinic before they were able to secure the current appointment with the

³⁵ Interviews with ADT Dental, Apple Tree Dental, Family Dental Care and HCMC.

³⁶ Minnesota Hospital Association, Data on Hospital-based Outpatient ED Care for Dental Conditions by Principal Diagnosis, 2006-2012. Data prepared on September 12, 2013.

³⁷ Ibid.

dental therapist. Just over half (53 percent) of those making the appointment for a dental emergency had not had a dental appointment for over a year, while 42 percent had visited a dental clinic in the past year, and 6 percent had never visited a dental clinic before.

Only 4 percent of survey respondents indicated they had been to an emergency room in the past two years for dental pain not caused by an injury. The majority of these patients (85 percent) were adults; adults were nearly five times more likely to have visited an emergency room in the past 2 years for dental pain compared to those under 18 years of age (OR= 4.61, CI = 2.24 to 9.49).

Those who visited an emergency room in the past two years were over three times more likely than those who hadn't visited an ER to have tried to get an appointment at another dental clinic before securing this appointment with the dental therapist. It is possible at least some of these patients may have resorted to going to the emergency room after failed attempts to get an appointment at a dental clinic; the current appointment with the dental therapist may have prevented their going to an emergency room again for care.

Patients who had visited the emergency room in the past two years were nearly three times more likely to have moved within the past year (OR=2.9, CI 1.6 to 5.2), after controlling for the time it took to get to the appointment. It appears that those individuals who move more frequently may experience a greater challenge in gaining access to care at a dental clinic, even if travel time is not an issue.

Several of the clinic interviews also referred to the impact of dental therapists on emergency care. Several noted that dental therapists are reducing emergency room visits (and the associated costs) by allowing more patients to be seen earlier.³⁸ As one clinic director noted in an interview, the procedure is simpler if decay isn't allowed to progress, and with dental therapists they are able to treat more patients sooner, many now even with same-day treatment.³⁹ This is especially important in those cases where the patient might not be treated elsewhere; as the same clinic director noted, their patients may have been to an emergency room or another clinic for an exam, but no other clinic would take them for the restorative care they needed.

At two other sites, the addition of a dental therapist has directly allowed re-direction of patients who would otherwise go to emergency rooms. Both are clinics associated with hospitals. At Hennepin County Medical Center, the dental therapist has a chair in the Obstetrics department and treats pregnant women who would have been sent to the emergency room for care.⁴⁰ At St. Joseph's Area Health Services in Park Rapids, emergency room staff now refer patients with dental pain directly to the dental clinic located within the hospital.⁴¹ St. Joseph's believes some of these patients are actually drug-seeking patients without serious dental emergencies, and it has seen a decline in drug-seeking patients since beginning diversion of emergency room dental patients to the dental therapist. At both HCMC and St. Joseph's, the diversion procedures became possible because of the capacity added by the dental therapist.

³⁸ Interviews with Apple Tree Dental, Family Dental Care, and HealthPartners.

³⁹ Interview with Apple Tree Dental.

⁴⁰ Interview with Hennepin County Medical Center.

⁴¹ Interview with St. Joseph's Area Health Services – Community Dental Clinic.

E. Costs to the public health system.

As noted above, data on payments and services billed to Minnesota public programs by dental therapists were unavailable for the current assessment. In addition, consistent all-payer standards and procedures for identifying dental therapists as treating providers are needed.

With state public program reimbursement rates for dental therapist services the same as the rates for dentist services, there is not necessarily an immediate savings to the state on each claim paid; however, the differential between DHS rates and clinics' lower personnel costs for dental therapists appears to be contributing to more patients being seen.

VIII. Additional findings

In addition to the specific measures of impact outlined in the 2009 Minnesota dental therapy law, the following are supplemental findings that emerged from the assessment. These findings offer additional information on the early impact of dental therapists on the delivery of and access to dental services in the state.

A. Clinics report additional impacts of dental therapists, including personnel cost savings, increased dental team productivity, and improved patient satisfaction.

Two thirds of the clinics interviewed noted the significant savings in personnel costs that come with employing a dental therapist compared to a dentist.⁴² Several pointed out that a dental therapist costs roughly half as much as a dentist; one clinic calculated their savings at \$62,000 per dental therapist when malpractice insurance and other differentials are factored in, while others estimated the savings to be \$35,000-\$50,000 per dental therapist.⁴³ All but one clinic that reported malpractice premiums for dental therapists reported premium prices significantly below dentist malpractice premiums; premiums at the outlier clinic were similar to dentist premiums.

Many of the clinic directors also observed the versatility and flexibility dental therapists have brought to their dental teams, and reported this has led to an overall increase in productivity. Clinics also reported that having a dental therapist frees up the dentist to focus on more complex procedures.⁴⁴ This has allowed for more appropriate and more accessible scheduling, brought financial benefits to the clinic, and in some cases led clinics to begin (or resume) offering more complicated services than they were able to offer without the dental therapist.

Clinics also referred to more intangible ways the dental therapist has improved the work of their teams and practices. "Dental therapists are the 'glue' that hold dental clinics together, like a nurse at a hospital does," said a director at Family Dental Care. "Dental therapists also help everyone become better professionals by providing dental education and a quality experience for

⁴² Interviews with Children's Dental Services, ADT Dental, Apple Tree Dental, Main Street Dental, HealthPartners, HCMC and St. Joseph's.

⁴³ Interviews with Children's Dental Services, Apple Tree Dental and Family Dental Care.

⁴⁴ Interviews with Children's Dental Services, ADT Dental, Apple Tree Dental, Main Street Dental, HealthPartners, Metropolitan State University Dental Clinic, Family Dental Care, Moorhead State Technical College, HCMC and St. Joseph's.

patients.” Another clinic director stated: “Dental therapists are doing a lot toward evidence-based dentistry – a hidden benefit.”

Finally, several clinics reported high levels of patient satisfaction with dental therapists, in part because they are able to spend more time with patients, and can offer chairside education and prevention information.⁴⁵ “We look carefully at patient satisfaction and the quality is wonderful with the dental therapist,” a director at HealthPartners noted.

B. The savings resulting from the lower costs of dental therapists are allowing clinics to expand capacity to serve more underserved and public program patients.

Clinics have been able to use the savings made possible from a dental therapist to “add chairs” (and related equipment and supplies) to serve more patients.⁴⁶ Clinics also noted that the cost differential has made it possible for them to recoup capital expansion costs faster. In one case the clinic has hired 1.2 full-time equivalent (FTE) dental therapists to serve underserved patients, and noted it would not have been able to afford 1.2 FTE dentists.⁴⁷ Another clinic noted that the savings yielded from having the dental therapist has made the difference in terms of sustainability for the clinic overall: as recently as last year, the rural hospital-based clinic – whose clientele is nearly all enrolled in public programs – was losing significant amounts in uncompensated care, even with long waiting lists. Adding a dental therapist has doubled their capacity, erased their waiting list and allowed the clinic to begin accepting direct referrals from the nearby emergency room.⁴⁸

C. Start-up experiences with dental therapists have varied, and employers expect continuing evolution of the profession’s role and impact.

Dental therapists’ ability to perform routine procedures is freeing up dentists’ time for complex procedures. Because most patients first see a dental hygienist and receive a dentist’s exam, most dental therapist patients have been follow-up/restorative care patients. Dental therapists give the clinics more flexibility to juggle schedules to fit patients in and to assign procedures on the fly to the most fitting and most available member of the team. This has increased flexibility and efficiency.

Time to achieve break-even employing a dental therapist has varied. Many clinics began using dental therapists on a part-time basis, increasing hours as routines were established and capacity to accept new patients grew. Clinics feel they are “writing the book” on employing dental therapists.

Many of the clinics noted that introducing a dental therapist involved a ramp-up period, as team members defined and became comfortable with the new patient flow and roles. “There is a learning curve effect,” said a director at Apple Tree Dental. “The first and second year can be rocky as the team ramps up. The dentists on the team may not be referring as much as possible.

⁴⁵ Interviews with HealthPartners, Family Dental Care and St. Joseph’s.

⁴⁶ Interviews with ADT Dental, Apple Tree Dental and Family Dental Care.

⁴⁷ Interview with Family Dental Care.

⁴⁸ Interview with St. Joseph’s in Park Rapids.

We expect additional productivity as the practice gets up to speed.”⁴⁹ Another director likened it to “the invention of electricity...the gates have just barely opened. It’s hard to know what can be done until it has been applied and accepted.”⁵⁰

D. Most clinics that have employed dental therapists for at least one year are considering hiring additional dental therapists.

Many of the clinics, particularly those with longer experience with dental therapists, said they would like to hire more or were in the midst of hiring more dental therapists at the time of the interview.⁵¹ Several were limited only by space and equipment, and would hire more dental therapists if they could increase the number of chairs. Others would hire more if they could find advanced dental therapists in particular, as their ability to work without a dentist on site would open up more possibilities. A small rural clinic noted that it currently must close the clinic if its one dentist isn’t available, because its dental therapist cannot perform her full scope of practice without a supervising dentist on site; if it had an advanced dental therapist, the clinic could remain open to meet the needs of some patients.⁵² Another clinic (also rural) suggested that the scope of practice for dental therapists should be expanded, for similar reasons.⁵³

IX. Evaluation limitations

As the first evaluation of state-licensed dental therapists, this study faced challenges and limitations, and must be understood in context. Because the assessment took place at the very beginning of the introduction of dental therapists in Minnesota - there were five dental therapists employed in the state at the beginning of the survey component of the project and 20 at its end - it is a first snapshot of dental therapist impacts. In addition to producing preliminary findings, MDH considers this effort in part to be formative research, intended to inform a learning process by identifying questions and approaches for future research.

The timing of the evaluation led to several key challenges. Although the 2009 Legislature set the report deadline five years into the future, the profession has yet to reach maturity. The first dental therapist began work in 2011, and hiring statewide began slowly. Thus, the study had limited numbers of dental therapists, clinics and patients available as subjects. It is also important to note that no clinics employed advanced dental therapists when the study began; the first advanced dental therapist was certified in February 2013, and only three were certified as of the end of the study (December 2013). Thus data and observation in this report are almost exclusively about dental therapists. With a broader scope of practice and less confining supervisory requirements, there is not yet a significant basis to evaluate the impacts of advanced dental therapists. Results of this project cannot be generalized and applied to the impacts advanced dental therapist will have as their numbers grow.

This timing also meant that the survey was by necessity developed before any patterns of practice were established by clinics employing dental therapists. The survey included certain

⁴⁹ Interview with Apple Tree Dental.

⁵⁰ Interview with HealthPartners.

⁵¹ Interviews with Children’s Dental Service, Community Dental Care, Apple Tree Dental and HealthPartners.

⁵² Interview with St. Joseph’s in Park Rapids.

⁵³ Interview with Main Street Clinic in Montevideo.

assumptions about scheduling, sequence of visits for exams, prophylaxis and restorative services, and division of labor among the members of the dental team. Actual practice patterns developed differently as early employers “wrote the book” - or at least first chapters - on dental therapy practice.

Specifically, this timing misalignment limited the evaluation as follows:

- **Patient flow.** The survey protocol was designed with the assumption that patients seeking oral health services, especially public program enrollees, would be routed directly to the dental therapist as the first point of access. However, as clinics have integrated dental therapists into their teams, the sequence typically calls for the patient to be seen first by a dental hygienist, then examined by a dentist, and then scheduled for a return visit with a dental therapist for fillings and other restorative services. Thus, a patient’s first visit with a dental therapist was most often a return trip to a clinic they had visited recently for intake and initial services. This may have affected certain survey answers. For example, many (72 percent) answered that they had been to a dental clinic less than one year ago, possibly referring to their previous dental appointment with the hygienist or dentist at the study site. Once this became clear, MDH sought and obtained additional information on patient characteristics directly from clinic leadership. Clinic interviews confirmed a reduction in wait times as reported by survey respondents.
- **Gradual ramp-up of patients.** The first cohort of dental therapists faced significant challenges in finding employment, and almost all worked part time at the start of the study as clinics figured out how to integrate this new team member into established oral health teams and patient flow. Their part-time status affected how many patients they were able to see. Study sites also noted that it took time to build the practice and publicize that public program enrollees were being accepted at private clinics and wait times were much shorter at community clinics.
- **Lack of public programs data.** As noted earlier, at the time of the study period (mid-2012 through 2013), Department of Human Services data systems could not yet distinguish whether a service was provided by a dentist or a dental therapist, so data on dental therapist services and payments was not available. MDH sought and received information from study clinics about their Medical Assistance and other payer mix as a substitute.

Finally, patients at some of the clinics may have had literacy challenges. Although the survey was translated into five languages in addition to English, a determination could not be made as to whether or not individuals were able to read. In addition, some of the questions may have been affected by the ability of the patient to correctly recall information from the past.

X. Conclusions and recommendations

The following are general conclusions and recommendations based on this initial evaluation of dental therapist impact at a very early stage of the profession’s development.

Conclusions

- A. **The dental therapy workforce is growing and appears to be fulfilling statutory intent by serving predominantly low-income, uninsured and underserved patients.** In three years,

the number of licensed dental therapists grew from 0 to 32, with additional graduates soon to enter the workforce in 2014. Licensing information confirms the dental therapists are working in rural and underserved urban settings, and initial administrative data from clinics employing dental therapists confirm that the great majority of patients treated by these providers are on public insurance programs.

- B. Dental therapists appear to be practicing safely, and clinics report improved quality and high patient satisfaction with dental therapist services.** To date, no safety complaints have been made or Board actions taken against dental therapists.
- C. Clinics employing dental therapists are seeing more new patients than before the arrival of the dental therapists, and most of the patients are enrolled in public programs or otherwise underserved.** The increase in patients appears largely attributable to the productivity of dental therapists, the improved efficiency of teams as they integrate dental therapists, and the economics of dental therapy.
- D. Dental therapists have made it possible for clinics to decrease travel time and wait times for some patients, increasing access.**
- E. Benefits attributable to dental therapists include direct costs savings, increased dental team productivity, improved patient satisfaction and lower appointment fail rates.** Clinics also report higher quality, with better team communication and specialization of roles.
- F. Savings from the lower costs of employing dental therapists are making it possible for clinics to expand capacity to see public programs and underserved patients.**
- G. Start-up experiences have varied, and employers expect continuing evolution of the dental therapist role.** Dental therapists' ability to perform routine procedures is freeing up dentists' time for complex procedures. Dental therapists give a clinic more flexibility to juggle schedules to fit patients in and to assign procedures on the fly to the most fitting and most available member of the team, increasing efficiency. Time to achieve break-even employing a dental therapist has varied.
- H. Most clinics employing dental therapists for at least a year are considering hiring additional dental therapists.** Clinics are also anticipating the availability of advanced dental therapists once early dental therapy graduates complete their 2,000 hours of practice and become eligible for certification as advanced dental therapists.
- I. Dental therapists offer potential for reducing unnecessary ER visits for non-injury dental conditions.** Clinic interviews documented innovative ways dental therapists are being used to prevent ER visits, in one case through direct referrals from the emergency room and in another by working in a hospital's obstetrics department.
- J. With identical state public program reimbursement rates for dentist and dental therapist services, there is not necessarily an immediate savings to the state on each**

claim paid; however, the differential between DHS rates and clinics' lower personnel costs for dental therapists appears to be contributing to more patients being seen.

Recommendations

- A. Research and evaluation by state government and others must continue to document the growth and development of dental therapy in Minnesota, as more dental therapists and advanced dental therapists enter practice.**

In addition to its early findings about the impact of dental therapists in Minnesota, this evaluation serves as formative research that can inform future directions and approaches of research and inquiry. Future research should continue to quantify the nature and impact of dental therapists on the outcome measures of interest to the legislature. Future research should also consider additional dimensions such as oral health team productivity, patient satisfaction, peer and patient acceptance challenges, employer preference and labor market dynamics for dental therapists prepared with and without a hygiene background, and numerous other issues that emerged through the initial field observations of this evaluation. Finally, future research should include advanced dental therapists as a priority topic, as their scope of practice and ability to work more independently will likely lead to additional impacts.

MDH plans to continue to evaluate dental therapists with oral health workforce funding from the U.S. Health Resources and Services Administration. The University of Minnesota, Delta Dental of Minnesota, Normandale Community College and Metropolitan State University, and several national organizations also have evaluations planned or underway. Such efforts should be encouraged.

- B. Payers, both public and private, should work to develop consistent approaches to identify, enroll and credential dental therapists and advanced dental therapists as providers in their systems. Insurers and other stakeholders could bring these issues to the Administrative Uniformity Committee, housed in MDH, where they can work on them together.**

The availability of uniform and consistent claims data is essential to capture costs and benefits to the public health care system and to society. Development of data elements and data systems takes time and coordinated effort. As a voluntary, broad-based group representing Minnesota health care public and private payers, health care providers and state agencies working to standardize, streamline, and simplify health care administrative processes, the Administrative Uniformity Committee has potential as a forum where progress on these important issues can be made.

- C. State government and others should collect and share best practices and disseminate lessons learned by early adopters to support prospective employers in more quickly becoming ready to hire dental therapists.**

Delta Dental of Minnesota is currently making start-up funding available to private practices and will be collecting those case studies. MDH, through its federally funded State Innovation Model

(SIM) grant, will also be collecting and disseminating best practices from the first cohorts of dental therapist employers. These and similar efforts can help address “fear of the unknown” barriers for prospective employers, speed the development of job opportunities for coming classes of dental therapy graduates, and contribute to the research base. Should funds be available, investments in start-up grants to willing employers, especially in underserved settings, could further realize the potential of dental therapy to expand access.

Appendix A: Study charge

Laws of Minnesota for 2009, Ch. 95, Art. 3, Sec. 31

IMPACT OF DENTAL THERAPISTS

1. The Board of Dentistry shall evaluate the impact of the use of dental therapists on the delivery of and access to dental services. The board shall report to the chairs and ranking minority members of the legislative committees with jurisdiction over health care by January 15, 2014:
 - (1) the number of dental therapists annually licensed by the board beginning in 2011;
 - (2) the settings where licensed dental therapists are practicing and the populations being served;
 - (3) the number of complaints filed against dental therapists and the basis for each complaint; and
 - (4) the number of disciplinary actions taken against dental therapists.

- (b) The board, in consultation with the Department of Human Services, shall also include the number and type of dental services that were performed by dental therapists and reimbursed by the state under the Minnesota state health care programs for the 2013 fiscal year.

- (c) The Board of Dentistry, in consultation with the Department of Health, shall develop an evaluation process that focuses on assessing the impact of dental therapists in terms of patient safety, cost-effectiveness, and access to dental services. The process shall focus on the following outcome measures:
 - (1) number of new patients served;
 - (2) reduction in waiting times for needed services; (3) decreased travel time for patients;
 - (4) impact on emergency room usage for dental care; and (5) costs to the public health care system.

- (d) The evaluation process shall be used by the board in the report required in paragraph (a) and shall expire January 1, 2014.

Appendix B: Minnesota dental therapist statutes

150A.105 DENTAL THERAPIST

Subdivision 1. **General.** A dental therapist licensed under this chapter shall practice under the supervision of a Minnesota-licensed dentist and under the requirements of this chapter.

Subd. 2. **Limited practice settings.** A dental therapist licensed under this chapter is limited to primarily practicing in settings that serve low-income, uninsured, and underserved patients or in a dental health professional shortage area.

Subd. 3. **Collaborative management agreement.** (a) Prior to performing any of the services authorized under this chapter, a dental therapist must enter into a written collaborative management agreement with a Minnesota-licensed dentist. A collaborating dentist is limited to entering into a collaborative agreement with no more than five dental therapists or advanced dental therapists at any one time. The agreement must include:

- (1) practice settings where services may be provided and the populations to be served;
- (2) any limitations on the services that may be provided by the dental therapist, including the level of supervision required by the collaborating dentist;
- (3) age- and procedure-specific practice protocols, including case selection criteria, assessment guidelines, and imaging frequency;
- (4) a procedure for creating and maintaining dental records for the patients that are treated by the dental therapist;
- (5) a plan to manage medical emergencies in each practice setting where the dental therapist provides care;
- (6) a quality assurance plan for monitoring care provided by the dental therapist, including patient care review, referral follow-up, and a quality assurance chart review;
- (7) protocols for administering and dispensing medications authorized under subdivision 5, and section 150A.106, including the specific conditions and circumstance under which these medications are to be dispensed and administered;
- (8) criteria relating to the provision of care to patients with specific medical conditions or complex medication histories, including requirements for consultation prior to the initiation of care;
- (9) supervision criteria of dental assistants; and
- (10) a plan for the provision of clinical resources and referrals in situations which are beyond the capabilities of the dental therapist.

(b) A collaborating dentist must be licensed and practicing in Minnesota. The collaborating dentist shall accept responsibility for all services authorized and performed by the dental therapist pursuant to the management agreement. Any licensed dentist who permits a dental therapist to perform a dental service other than those authorized under this section or by the board, or any dental therapist who performs an unauthorized service, violates sections 150A.01 to 150A.12.

(c) Collaborative management agreements must be signed and maintained by the collaborating dentist and the dental therapist. Agreements must be reviewed, updated, and submitted to the board on an annual basis.

Subd. 4. **Scope of practice.** (a) A licensed dental therapist may perform dental services as authorized under this section within the parameters of the collaborative management agreement.

(b) The services authorized to be performed by a licensed dental therapist include the oral health services, as specified in paragraphs (c) and (d), and within the parameters of the collaborative management agreement.

(c) A licensed dental therapist may perform the following services under general supervision, unless restricted or prohibited in the collaborative management agreement:

- (1) oral health instruction and disease prevention education, including nutritional counseling and dietary analysis;
- (2) preliminary charting of the oral cavity;
- (3) making radiographs;
- (4) mechanical polishing;
- (5) application of topical preventive or prophylactic agents, including fluoride varnishes and pit and fissure sealants;
- (6) pulp vitality testing;
- (7) application of desensitizing medication or resin;
- (8) fabrication of athletic mouthguards;
- (9) placement of temporary restorations;
- (10) fabrication of soft occlusal guards;
- (11) tissue conditioning and soft reline;
- (12) atraumatic restorative therapy;
- (13) dressing changes;
- (14) tooth reimplantation;
- (15) administration of local anesthetic; and
- (16) administration of nitrous oxide.

(d) A licensed dental therapist may perform the following services under indirect supervision:

- (1) emergency palliative treatment of dental pain;
- (2) the placement and removal of space maintainers;
- (3) cavity preparation;
- (4) restoration of primary and permanent teeth;
- (5) placement of temporary crowns;
- (6) preparation and placement of preformed crowns;
- (7) pulpotomies on primary teeth;
- (8) indirect and direct pulp capping on primary and permanent teeth;
- (9) stabilization of reimplanted teeth;
- (10) extractions of primary teeth;
- (11) suture removal;
- (12) brush biopsies;
- (13) repair of defective prosthetic devices; and

(14) recementing of permanent crowns.

(e) For purposes of this section and section 150A.106, "general supervision" and "indirect supervision" have the meanings given in Minnesota Rules, part 3100.0100, subpart 21.

Subd. 5. Dispensing authority. (a) A licensed dental therapist may dispense and administer the following drugs within the parameters of the collaborative management agreement and within the scope of practice of the dental therapist: analgesics, anti-inflammatories, and antibiotics.

(b) The authority to dispense and administer shall extend only to the categories of drugs identified in this subdivision, and may be further limited by the collaborative management agreement.

(c) The authority to dispense includes the authority to dispense sample drugs within the categories identified in this subdivision if dispensing is permitted by the collaborative management agreement.

(d) A licensed dental therapist is prohibited from dispensing or administering a narcotic drug as defined in section 152.01, subdivision 10.

Subd. 6. Application of other laws. A licensed dental therapist authorized to practice under this chapter is not in violation of section 150A.05 as it relates to the unauthorized practice of dentistry if the practice is authorized under this chapter and is within the parameters of the collaborative management agreement.

Subd. 7. Use of dental assistants. (a) A licensed dental therapist may supervise dental assistants to the extent permitted in the collaborative management agreement and according to section 150A.10, subdivision 2.

(b) Notwithstanding paragraph (a), a licensed dental therapist is limited to supervising no more than four licensed dental assistants or nonlicensed dental assistants at any one practice setting.

Subd. 8. Definitions. (a) For the purposes of this section, the following definitions apply.

(b) "Practice settings that serve the low-income and underserved" mean:

(1) critical access dental provider settings as designated by the commissioner of human services under section 256B.76, subdivision 4;

(2) dental hygiene collaborative practice settings identified in section 150A.10 subdivision 1a, paragraph (e), and including medical facilities, assisted living facilities, federally qualified health centers, and organizations eligible to receive a community clinic grant under section 145.9268, subdivision 1;

(3) military and veterans administration hospitals, clinics, and care settings;

(4) a patient's residence or home when the patient is home-bound or receiving or eligible to receive home care services or home and community-based waived services regardless of the patient's income;

(5) oral health educational institutions; or

(6) any other clinic or practice setting, including mobile dental units, in which at least 50 percent of the total patient base of the dental therapist or advanced dental therapist consists of patients who:

- (i) are enrolled in a Minnesota health care program;
- (ii) have a medical disability or chronic condition that creates a significant barrier to receiving dental care;
- (iii) do not have dental health coverage, either through a public health care program or private insurance, and have an annual gross family income equal to or less than 200 percent of the federal poverty guidelines; or
- (iv) do not have dental health coverage, either through a state public health care program or private insurance, and whose family gross income is equal to or less than 200 percent of the federal poverty guidelines.

(c) "Dental health professional shortage area" means an area that meets the criteria established by the secretary of the United States Department of Health and Human Services and is designated as such under United States Code, title 42, section 254e.

History: 2009 c 95 art 3 s 24; 2012 c 180 s 7

150A.106 ADVANCED DENTAL THERAPIST

Subdivision 1. **General.** In order to be certified by the board to practice as an advanced dental therapist, a person must:

- (1) complete a dental therapy education program;
- (2) pass an examination to demonstrate competency under the dental therapy scope of practice;
- (3) be licensed as a dental therapist;
- (4) complete 2,000 hours of dental therapy clinical practice under direct or indirect supervision;
- (5) graduate from a master's advanced dental therapy education program;
- (6) pass a board-approved certification examination to demonstrate competency under the advanced scope of practice; and
- (7) submit an application and fee for certification as prescribed by the board.

Subd. 2. **Scope of practice.** (a) An advanced dental therapist certified by the board under this section may perform the following services and procedures pursuant to the written collaborative management agreement:

- (1) an oral evaluation and assessment of dental disease and the formulation of an individualized treatment plan authorized by the collaborating dentist;
- (2) the services and procedures described under section 150A.105, subdivision 4, paragraphs (c) and (d); and
- (3) nonsurgical extractions of permanent teeth as limited in subdivision 3, paragraph (b).

(b) The services and procedures described under this subdivision may be performed under

general supervision.

Subd. 3. Practice limitation. (a) An advanced practice dental therapist shall not perform any service or procedure described in subdivision 2 except as authorized by the collaborating dentist.

(b) An advanced dental therapist may perform nonsurgical extractions of periodontally diseased permanent teeth with tooth mobility of +3 to +4 under general supervision if authorized in advance by the collaborating dentist. The advanced dental therapist shall not extract a tooth for any patient if the tooth is unerupted, impacted, fractured, or needs to be sectioned for removal.

(c) The collaborating dentist is responsible for directly providing or arranging for another dentist or specialist to provide any necessary advanced services needed by the patient.

(d) An advanced dental therapist in accordance with the collaborative management agreement must refer patients to another qualified dental or health care professional to receive any needed services that exceed the scope of practice of the advanced dental therapist.

(e) In addition to the collaborative management agreement requirements described in section 150A.105, a collaborative management agreement entered into with an advanced dental therapist must include specific written protocols to govern situations in which the advanced dental therapist encounters a patient who requires treatment that exceeds the authorized scope of practice of the advanced dental therapist. The collaborating dentist must ensure that a dentist is available to the advanced dental therapist for timely consultation during treatment if needed and must either provide or arrange with another dentist or specialist to provide the necessary treatment to any patient who requires more treatment than the advanced dental therapist is authorized to provide.

Subd. 4. Medications. (a) An advanced dental therapist may provide, dispense, and administer the following drugs within the parameters of the collaborative management agreement, within the scope of practice of the advanced dental therapist practitioner, and with the authorization of the collaborating dentist: analgesics, anti-inflammatories, and antibiotics.

(b) The authority to provide, dispense, and administer shall extend only to the categories of drugs identified in this subdivision, and may be further limited by the collaborative management agreement.

(c) The authority to dispense includes the authority to dispense sample drugs within the categories identified in this subdivision if dispensing is permitted by the collaborative management agreement.

(d) Notwithstanding paragraph (a), an advanced dental therapist is prohibited from providing, dispensing, or administering a narcotic drug as defined in section 152.01, subdivision 10.

History: 2009 c 95 art 3 s 25; 2012 c 180 s 8

Appendix C: Survey instrument

Dental Therapist Patient Survey

Please complete this survey and give it to the dental office staff or return it in the postage paid envelope.

The Minnesota Department of Health is evaluating the impact of licensed dental therapists on access to dental care. This survey has 12 questions and will take about 5 minutes of your time. Your answers are important.

Please mark a response for every question or draw a line through the question if you choose not to answer.

This survey may be completed by a dental patient who has received services from a dental therapist or by the parent or guardian of a patient under the age of 18 years.

Data Privacy

- The Minnesota Department of Health is required by the Minnesota Data Practices Act to maintain privacy of personal health information. All information collected in this study that identifies individual patients will remain completely private. We are aggregating the results by clinic; only the clinic ID number will be used for reporting.
- Any published reports will not contain identifying information, and there will be no information identifying any individual.

Voluntary Participation

- Participation in this research is voluntary.
- Choosing not to participate will not affect your future relations with any of the persons, clinics or offices involved in this effort.
- Completion of this questionnaire implies consent to participate.
- You are free to skip questions you choose not to answer.

Questions

- Contact Leslie Nordgren, Minnesota Department of Health Research Specialist, at 651-201-3856 if you have questions.
- If you have questions about your rights pertinent to this research, contact Peter Rode, Minnesota Department of Health IRB, 651-201-5942.

**PLEASE PLACE THE SURVEY IN THE POSTAGE-PAID RETURN ENVELOPE
AND LEAVE AT THE FRONT DESK.**

Thank You!

Leslie Nordgren, RDH, MPH, PhD
Office of Rural Health and Primary Care
Minnesota Department of Health
P.O. Box 64882, St. Paul, MN 55164-0882
651-201-3856
leslie.nordgren@state.mn.us

Please give survey to the dental office staff or return survey in postage-paid return envelope.



FILL OUT A SEPARATE SURVEY FOR EACH DENTAL PATIENT SEEN TODAY.

1. **Who** received dental care today?

CHECK ONE

- Myself
- My child under age 18
- My dependent for whom I am a legal guardian. Explain relationship: _____
- Other. Please explain: _____

ANSWER THE FOLLOWING QUESTIONS FOR THE PERSON RECEIVING DENTAL CARE TODAY.

2. **When** did you last go to a dental clinic?

CHECK ONE

- Less than 1 year ago.
- 1 year ago or longer. How many years? _____
- This is my first dental appointment.

3. What was **the reason** for your dental visit today?

CHECK ONE

- Dental emergency (pain, etc.)
- Routine dental check-up
- Other. Please explain: _____

4. **How long** did it take for you **to get this appointment?**

CHECK ONE

- Less than 1 week
- At least 1 week but less than 1 month
- At least 1 month but less than 2 months

- At least 2 months but less than 3 months
- 3 months or longer
- I don't know

5. **How long** did it take for you to get a **dental appointment at the last dental clinic you visited** prior to this appointment? CHECK ONE

- Less than 1 week
- At least 1 week but less than 1 month
- At least 1 month but less than 2 months
- At least 2 months but less than 3 months
- 3 months or longer
- I don't know
- This is my first dental appointment.

6. Before making this appointment did you **try to get an appointment at another dental clinic** to take care of the dental needs you had today?

- Yes No

7. Have you been to **this dental clinic for your last dental appointment?**

- Yes No
- This is my first dental appointment.

8. **How long** did it take you to **travel to this appointment?**

CHECK ONE

- Less than 30 minutes
- At least 30 minutes but less than 1 hour
- At least 1 hour but less than 2 hours
- More than 2 hours
- I don't know

9. **How long** did it take you to **travel to the last dental clinic or dental office you visited** prior to this appointment?

CHECK ONE

- Less than 30 minutes
- At least 30 minutes but less than 1 hour
- At least 1 hour but less than 2 hours
- More than 2 hours
- I don't know
- This is my first dental appointment.

10. **How easy or difficult** was it to **get transportation** to this appointment?

CIRCLE YOUR ONE BEST ANSWER

Very easy Somewhat easy Somewhat difficult Very difficult

11. Did you need to **visit a hospital emergency room** in the last 2 years for dental pain which was not caused by an injury?

- Yes No

If yes, how many times in the last two years? _____

12. What is the **zip code where you live**? _____

How long have you lived at this location? CHECK ONE

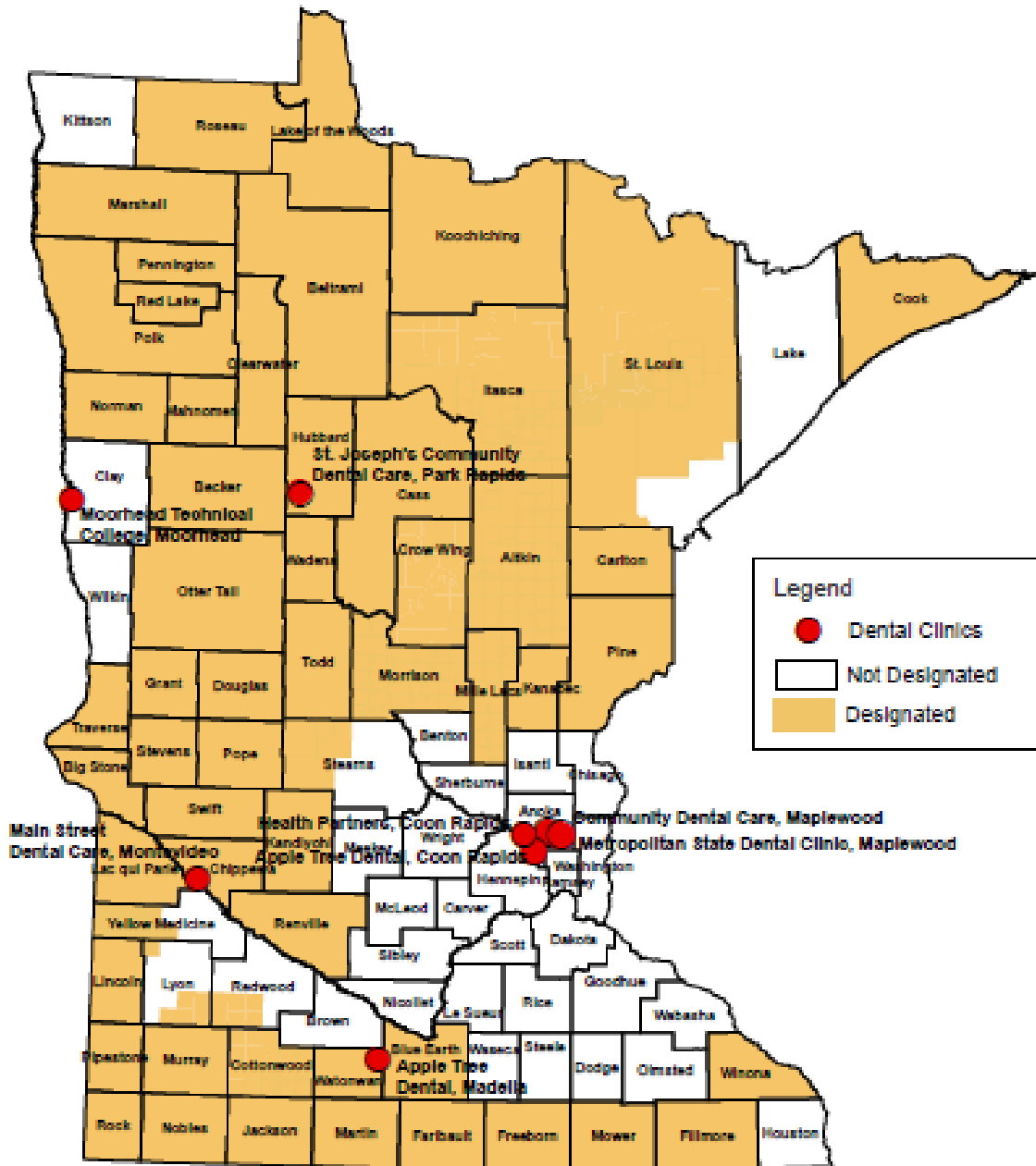
- Less than 1 year
- 1 year or more. How many years? _____

Thank You!

Please give survey to the **dental office staff** or return survey in **postage-paid return envelope**

Appendix D: Maps of study clinic locations

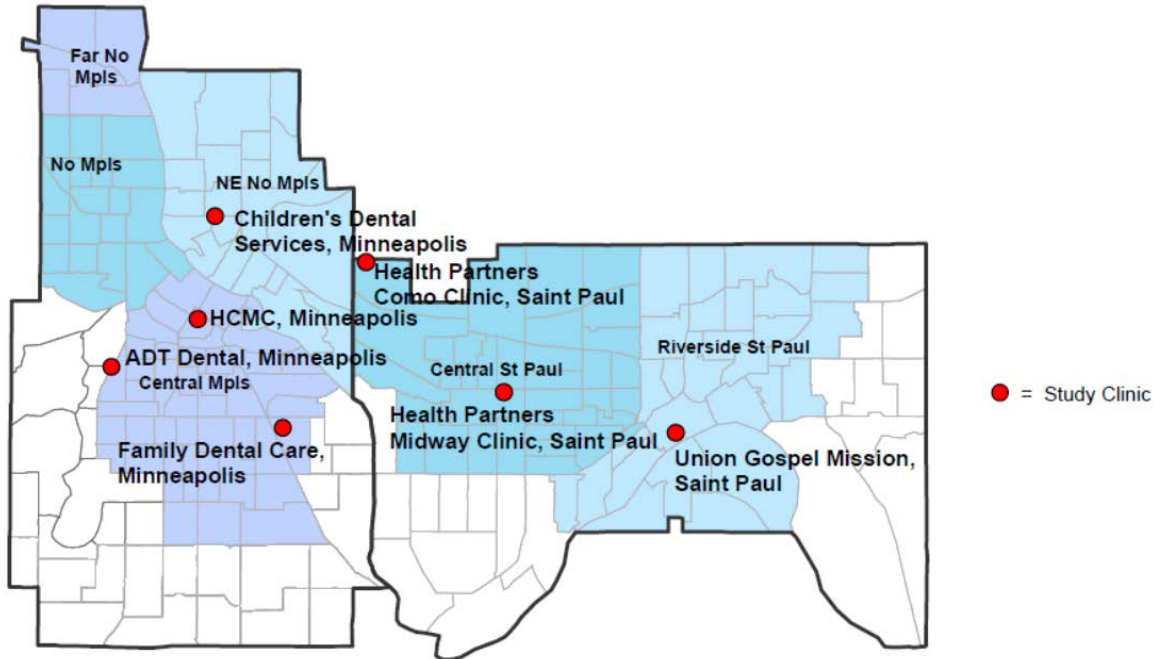
Map 1: Study clinics outside Minneapolis-St. Paul, in relation to designated Dental Health Professional Shortage Areas



Note: All areas are low-income designations.

Data source: Minnesota Department of Health, Office of Rural Health and Primary Care
January 2014

Map 2: Study clinics within Minneapolis-St. Paul, in relation to designated Dental Health Professional Shortage Areas



Note: All areas are low-income designations and each color represents a different shortage area.

Data source: Minnesota Department of Health, Office of Rural Health and Primary Care
January 2014