

Grand Marais Family Dentistry: Dental Therapist Case Study

Introduction

In Minnesota, the dental therapist profession was created through legislation in 2009 in an effort to increase access to oral health care. Dental therapists are primary oral health professionals who provide preventive, diagnostic, and restorative care for children and adults. Legislation limits dental therapists to practice primarily in settings that serve low-income, uninsured, and underserved patients, including dental Health Professional Shortage Areas (HPSAs).¹ However, as long as these requirements are met, dental therapists can work in any type of clinic, including private practices. They work under the supervision of a Minnesota-licensed dentist and under a collaborative management agreement that outlines the practice location and any limitations on services provided by the dental therapist, as well as quality and patient safety protocols.² Dental therapy is still an emerging profession and there are many unknowns about how to best incorporate dental therapists into dental teams. To gain a deeper understanding of this, Delta Dental of Minnesota supported two clinics to hire and employ a dental therapist professional for 12 months.

This case study explores the experience of one of the clinics: Grand Marais Family Dentistry in Grand Marais, Minnesota. The study attempts to answer whether adding a dental therapist in a private, for-profit clinic setting contributes positively to health care's triple aim of increasing access to care, providing quality care, and increasing cost effectiveness.

To evaluate this question, multiple research methods were used, including patient satisfaction surveys (completed by 397 adult patients), observation data, clinic service and financial data, and key informant interviews with the dental therapist and the dentist. The analysis in this brief focuses on the first 13 months after the dental therapist was hired (June 2014 – June 2015).

Total visits completed
by dental therapist

1,035

Characteristics of patients
seen by dental therapist

Average age (January – June 2015):

48

Type of procedure seen for:

RESTORATIVE
TREATMENT

69%

Type of insurance

(July 2014 – June 2015):

PUBLIC

36%

¹ Maps of HPSA in Minnesota and throughout the United States are available from <https://datawarehouse.hrsa.gov>

² More information about dental therapists, including procedures within their scope of practice are available from <http://mchoralhealth.org/mn/dental-therapy/>

ABOUT GRAND MARAIS FAMILY DENTISTRY

Grand Marais Family Dentistry is located in Grand Marais, Minnesota, a town of nearly 1,400 residents in a rural area of the state.³ Grand Marais is in Cook County, a designated Dental Health Professional Shortage Area.⁴ The office was described in observation data as a relaxed and collegial environment where people appeared to know one another well. The atmosphere was bright with a warm and cozy waiting room and art adorning the walls. Grand Marais Family Dentistry hired the dental therapist in June 2014. The dentist became familiar with the emerging dental therapy profession in dental school. The dental therapist chose this career path because he wanted to work in a field that aligned with his love of science and engineering, where he could do the most good for the most people, and where he could do the best he could for his family. The dental therapist worked at a clinic in the Twin Cities for one year before accepting the position with Grand Marais.

The decision to hire a dental therapist was made to reduce the dentist's caseload and to be able to continue serving patients enrolled in public health insurance plans, which would allow them to better serve lower-income residents. The dental therapist is compensated hourly, per the collaborative decision of the dentist and dental therapist.

Throughout the study, the dental therapist practiced within the scope of that title and under indirect supervision (a dentist needs to be on-site). He was not dually licensed as a hygienist and did not have the advanced certification to provide additional services. After this study, the dental therapist became certified as an Advanced Dental Therapist, which expanded his scope of work to include periodic and limited oral evaluations and extraction of mobile permanent teeth, as well as the ability to practice while the dentist is off-site.

Access to care

Patient mix

One of the aims of dental therapy is to increase access to care for underserved populations, as lowered staff costs allow clinics to accept uninsured and underinsured patients at less of a loss. Before hiring the dental therapist, the dentist saw patients who use Medical Assistance (MA), Minnesota's Medicaid program. However, because of low reimbursement rates, there was concern the clinic would not be able to continue serving this population. This was one of the primary motivations for hiring the dental therapist.

At least one-third of the patients seen by the dental therapist live in lower-income households. Thirty-six percent of patients⁵ seen by the dental therapist (July 2014 – June 2015) were enrolled in public insurance programs with income-based eligibility. Income levels for patients who paid for services using cash or a sliding fee scale (30%) were unknown, but may have included additional lower-income patients. The rest of the patients (36%) were enrolled in private insurance programs (Figure 1).

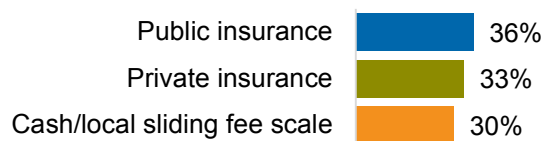
³ United States Census Bureau. (2010). *American FactFinder*. Retrieved from

[http://factfinder.census.gov/bkmk/cf/1.0/en/place/Grand Marais city, Minnesota/POPULATION/DECENNIAL_CNT](http://factfinder.census.gov/bkmk/cf/1.0/en/place/Grand%20Marais%20city%2C%20Minnesota/POPULATION/DECENNIAL_CNT)

⁴ United States Department of Health and Human Services. (2016). *Health Resources and Services Administration: Data Warehouse*. Retrieved from <http://datawarehouse.hrsa.gov/tools/analyzers/HpsaFind.aspx>

⁵ These are patient visits and not unique patients.

1. Dental therapist patient insurance mix



Note. Percentages do not equal 100% due to rounding.

The dentist saw a slightly higher proportion of patients with private insurance (39%) and patients who paid for services with cash or using the sliding fee scale (31%). The dentist saw fewer patients with public insurance (30%).

In patient surveys, the majority of clinic patients reported they had not visited a dental professional for two or more years. The dental therapist's patients were less likely to report having been to a clinic within the last two years (83%) than the dentist's (89%) or dental hygienists' (96%) patients.

Patient data showed that there was little change in the types of insurance that patients had in the six months following the dental therapist's hire. Forty-three percent of the patients seen by the clinic before hiring the dental therapist had private insurance, while fewer had public insurance (27%⁶), or paid for services using cash or a sliding fee scale (30%). This remained largely the same during the first 6 months after hiring the dental therapist. The proportion of procedures paid for by various insurance types showed similar results. **However, the highest increase in patient volume came from patients with public insurance (22%).**

Throughout the year, the dental therapist did child screenings at local elementary and middle schools, as well as for young children (ages 3-4) through the Early Childhood Family Education program. He also went to the Women, Infants, and Children (WIC) nutrition program once to conduct screenings for children. He provided free risk assessments and oral hygiene instructions one day per month for high- and severe-risk students through the Oral Health Task Force. This may have brought in more patients enrolled in subsidized or public insurance programs.

Pre-visit experience

Another way to measure access to care is the quality of the patient's experience before seeing the provider, including appointment wait times and satisfaction with their pre-visit experience. **Staff reported that wait times at the clinic overall had decreased from three to four weeks to one week after hiring the dental therapist.** When asked about the timeliness of their scheduled appointment as well as if they were greeted promptly and courteously, the dental therapist's patients, on average, "strongly agreed" their experience was favorable, similar to the results for patients of the dentist and dental hygienists.

⁶ This is somewhat lower than the proportion of residents enrolled in public or subsidized insurance in Cook County overall, which is 38 percent. United States Census Bureau. (2010). *American FactFinder*. Retrieved from http://factfinder.census.gov/bkmk/table/1.0/en/ACS/14_5YR/DP03/0100000US10500000US27031

Quality of care

Service delivery

To explore how the quality of the dental therapist's work compared to the dentist, data were collected from patient surveys, staff interviews, and clinic observations. Key informant interviews and observation data found that the dental therapist was intentional about building rapport with patients both inside and outside of the clinic. When working with patients, the dental therapist would explain that he was a dental therapist, but would not always go in depth on how his role was different from that of the dentist or hygienist.

According to staff, patients were receptive to the dental therapist and appreciated having access to dental care. Staff said some patients were supportive of the dental therapist but preferred to see the dentist. When observing, the researcher noted that at times patients hesitated when told they would see the dental therapist, but when it was explained that this was the clinic's procedure very few requested to see the dentist instead.

Overall, patients were very satisfied with the quality of care they received from the dental therapist. Following their appointment, patients were asked to complete a survey on their satisfaction with the provider's chair-side manner and their overall satisfaction. On all measures, the dental therapist's patients, on average, "strongly agreed" that the dental therapist's chair-side manner and technical skills were favorable, similar to the results for patients of the dentist and dental hygienists.

Overall, the dentist said the clinic's experience with the dental therapist was very positive and she was impressed with the quality of his technical skills. The dental therapist was described as professional, matter-of-fact, willing to learn, and intuitive when working with patients, particularly those who were hesitant about working with a dental therapist or being at the dentist.

Staff relations

The researcher described the relationships among staff as very collaborative and focused on learning and accuracy. To prepare dental staff for the addition of a dental therapist to the clinic, the role of the dental therapist was explained along with an assurance of his ability. The clinic also hired an assistant to work with the dental therapist. Staff were described as giving the dental therapist a very warm welcome and excited to have him on the team. Integration of the dental therapist on the dental team has gone very smoothly.

During observation, the transfer of patients between the dentist and dental therapist seemed very fluid. They appeared to have a collaborative relationship. The dentist trusted the dental therapist to do his work, and he went to her with additional questions as he examined patients and developed treatment plans. The dentist said that the time spent mentoring the dental therapist was worth the initial reduction in her workload. The dental therapist became more independent over time, requiring less supervision from the dentist and allowing the dentist to ultimately have a workload that included fewer, but more complex, procedures. Overall, the dental therapist felt welcomed to the clinic and said he received the support he needed from the collaborating dentist.

Professional role

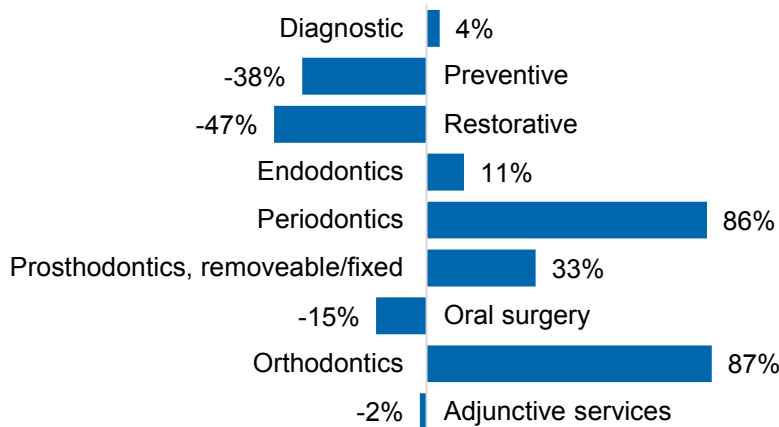
In total, the dental therapist completed 1,658 procedures during the first 13 months after hire. In terms of role, staff reported that the dentist would delegate procedures, mostly restorative and emergency, to the dental therapist, as needed. The dental therapist would typically do the preliminary charting, pulp vitality testing, and diagnostic x-rays and then collaborate with the dentist for a final diagnosis and treatment plan.

Similar to findings from the 2014 Minnesota Legislative report on dental therapists,⁷ **clinic data showed the majority of the procedures completed by the dental therapist between June 2014 – June 2015 were restorative treatments (69%),** followed by diagnostic x-rays (23%). The dental therapist completed far fewer adjunctive⁸ (5%), preventive (2%), and prosthodontic (1%) procedures.

Results showed a shift in the volume of various procedures performed by the dentist with the addition of the dental therapist. Most notably were the increases in the number of orthodontic (87%) and periodontic (86%) procedures performed by the dentist. There was a 47 percent decrease in restorative procedures performed, a 38 percent decrease in preventive treatments, and 15 percent decrease in oral surgeries performed by the dentist (Figure 2).

The number of procedures performed by a part-time dentist did decrease over the course of this study, which may also impact the clinic's capacity to perform the same number of certain types of procedures, such as oral surgeries. The dentist noted that the increase in periodontic procedures was largely due to the dentist doing most of the deep cleaning procedures to maximize the clinic's capacity for hygiene visits. The clinic will need to hire another hygienist in order to increase the capacity of the staff to perform services that maximize the dental therapist's scope of care.

2. Change in dentist's procedures since hire of dental therapist



⁷ Minnesota Department of Health. (2014). *Early impacts of dental therapists in Minnesota: Report to the Minnesota Legislature 2014*. Retrieved from <http://www.health.state.mn.us/divs/orhpc/workforce/dt/dtlegisrpt.pdf>

⁸ Adjunctive services include delivery of anesthesia, application of desensitizing medicament, and other services that enable procedure to be completed more easily.

Financial viability

Productivity

The dental therapist completed 1,035 visits from June 2014 – June 2015. The average hours worked was 82 per month (.5 FTE). On average, the dental therapist completed one visit every hour. He completed one to two procedures within that hour, while the dentist completed approximately five procedures per hour. The dental therapists' productivity (visits per hour and procedures per hour) increased slightly over time. There was little change in the number of procedures completed by the dentist each hour. Changes in rate are heavily influenced by the complexity of the procedures completed at the clinic and routed to each provider. The dental therapist reported having a full schedule most of the time, and expressed interest in doing more pediatric care and health promotion.

There was an increase in the average number of patient visits to the clinic after the dental therapist's hire. There were 385 patient visits in the six months before the dental therapist was hired (December 2013 – May 2014), compared with 450 patient visits during the same period one year later.

Changes in revenue

The addition of the dental therapist to Grand Marais Family Dentistry generated positive financial returns.

The average monthly revenues associated with the dental therapist increased by 19 percent during the study period. Although adding a dental therapist suggests additional personnel costs, the office experienced a 9 percent reduction in average monthly expenses, largely due to a reduction in hours for the clinic's second part-time dentist. Overall, the net benefit to the clinic after hiring the dental therapist was 13 percent of its average monthly revenue.

The main factors impacting profitability is the productivity of the therapist and the reduction in hours of the second part-time dentist. The therapist generated an estimated average of \$16,926 in revenues per month to the clinic. The added productivity of the therapist was large enough to compensate for a decrease in productivity among other providers, as well as the reduction in revenue from procedures completed by the part-time dentist.

Reimbursement rates and the clinic's payer mix (i.e., percentage of revenue from private sources, public programs, and self-pay), two factors largely beyond the control of the clinic, also play a significant role in financial stability. Dental therapists are required to work in areas where they will treat patients enrolled in public programs or with limited access to dental services. Because of this requirement, reimbursement revenue generated by dental therapists can be lower than a member of the dental team serving primarily private pay or commercially insured patients. Changes in either of these factors will have an impact on clinic revenue.

Conclusions

The hire of the dental therapist at Grand Marais Family Dentistry appears to have both benefited the clinic and presented some potential challenges.

Program successes

- There was some growth in the volume of patient visits with public insurance after the dental therapist was hired.

- The dental therapist provided free dental screenings and some treatment to low-income and high-risk community members.
- Staff reported a decrease in wait times for scheduling an appointment at the clinic.
- Patient surveys indicated equally high levels of patient satisfaction with the technical skills and chair-side manner of the dental therapist compared to the dentist and dental hygienists.
- Dental staff were satisfied with the quality of the dental therapist's work.
- The dentist was able to shift restorative procedures to the dental therapist and work on higher-fee procedures, such as orthodontic treatments.
- The dental therapist was able to focus on providing restorative treatments for lower-income patients.
- The dental therapists' productivity (visits per hour and procedures per hour) increased over time.
- The average number of clinic visits per month increased after the hire of the dental therapist.
- The net benefit generated by hiring the dental therapist was approximately 13 percent of the clinic's prior average monthly revenues (based on January – May production data).

Program challenges

- There were some limits on the dental therapist's capacity. For example, the dental therapist could not perform hygiene, and the dentist and dental therapist made a decision to not treat children under age 18 during the first year of collaboration.
- The dental therapist saw fewer patients per hour and performed fewer procedures per visit and per hour than the dentist; this may be the result of the types of procedures performed by the dental therapist and is expected whenever any new dental professional joins the clinic team.
- The clinic still experienced some financial burden from low reimbursement rates for patients with subsidized insurance.

Issues to explore

Hiring the dental therapist has benefited the clinic and the community in certain respects, while also presenting some challenges. The dental therapist role helped shift the focus of the dentist's work to higher-fee procedures, such as orthodontic treatments, while maintaining a high level of patient satisfaction with the quality of care they received from the dental therapist. As a result of this shift and other factors, the financial health of the clinic has improved with the addition of the dental therapist. However, despite these positive financial gains, the clinic was unable to fully maximize potential revenue because the dental therapist was unable to work at full capacity without the addition of a hygienist, and cannot provide for the needs of all pediatric patients. In addition, while unrelated to the dental therapy model, the clinic does still face some challenges related to low reimbursement rates for patients with certain public insurance plans, and providing care for a number of lower-income patients who use the clinic's sliding fee scale. If clinic management chooses to continue employing a dental therapist, they might consider ways to address challenges to productivity. The clinic also serves a lower proportion of patients who use public insurance than is represented in the county overall. They might explore ways to continue making this population aware of the clinic's ability to serve them.

The study did not assess changes in productivity or revenue after the dental therapist obtained licensure as an Advanced Dental Therapist, expanding the scope of services provided and increasing the number of procedures that can be completed without direct on-site supervision from the dentist. The impact of this change in staffing may be important to explore in subsequent studies.

Factors that may contribute to success

From this case study, several factors emerged that seem to have contributed to the successful components of incorporating a dental therapist at this clinic. Other clinics can consider these factors when deciding if they are a good candidate for adding a dental therapist to their team. Factors that support the success of the dental therapy model at a clinic include:

- Space available within the clinic
- A desire to significantly increase the overall number of patients seen in the clinic
- A desire to increase access to dental care for low-income patients
- A supervising dentist who has the capacity and willingness to provide timely clinical support
- A collaborative relationship and strong communication between the dentist and dental therapist
- The ability to hire a dental assistant and/or dental hygienist for the dental therapist

NOTES AND LIMITATIONS

The economic analysis conducted as part of this study used production and financial data from 2014 and 2015. The analysis accounts for seasonal fluctuation in production and procedures by type of provider during the study period. To achieve this goal, data from January – May 2015 (after the dental therapist was hired) was compared month to month with data from the previous year (January – May 2014). These five months are the only ones for which revenue and cost information was available before and after the dental therapist was hired. Revenues come from fees and procedures performed by the dental therapist. Increased productivity of dentists also includes procedures only performed by doctors. Additional costs refer to personnel costs before and after the dental therapist was added; however, profitability remains even when total cost is used in the computations. It should be noted that any financial gain estimated in this report may differ from profits or losses reflected in financial statements since these documents are based on many accounts aggregated for a whole year. In addition, financial statements also include accounting calculations that are not actual disbursements, such as depreciation and amortization.

This study of the dental therapy pilot project suggests positive results, but includes data from a relatively short period. A follow-up study, including data for a full year to capture any additional changes in productivity and revenue, may provide a more comprehensive understanding of the long-term financial viability of the dental therapist role in rural clinic settings. Conducting similar studies at other clinics could help determine the payor mix and patient load needed to make a dental therapist position financially sustainable.

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Addendum: Dental Therapist Production and Revenues

Grand Marais Family Dentistry

Introduction

This addendum to the case study contains detailed information on the changes in productivity, gross revenues, and cost-effectiveness associated with adding a dental therapist in a private, for-profit clinic in Grand Marais. It provides details on these outcomes by type of provider and for the whole office. Results should be interpreted with caution due to the limited amount data of the dental therapists' work time.

In general, results suggest that the dental therapist contribution in productivity is modest, yet the direct gross revenues produced by the therapist are significantly larger than the personnel cost associated with the position (see the variance analysis section). The overall gross revenues of the office don't show significant variation. However, during the period studied a doctor retired; revenues and costs were affected by this change in staffing. Even with this change, these analyses suggest that the therapist position would be financially viable under a fully staffed office.

Production

The average daily production refers to the total number of procedures performed by each type of provider (dental assistant, hygienist, doctor, and dental therapist) divided by the number of days worked during the period before and after adding the therapist. The before therapist period goes from December 2, 2013, to May 29, 2014, and the period with a therapist goes from June 2, 2014, to July 13, 2015.

- The dental therapist shows an average production of 9.7 procedures per day (during the 5-month period from January to May 2015).
- Dentists and hygienists show a slight decline in average daily productivity after the dental therapist was added to the staff. The other providers show no significant changes in productivity.
- The office (all providers) increased average daily productivity by 7.8 procedures. This increase comes mainly from the dental therapist's contribution.

1. Procedures by provider, before and after dental therapist

	Assistant		Dentist			Dental Therapist	Hygienist			All providers
	(1)	(2)	(1)	(2)	(Ortho)		(1)	(2)	(Temp)	
Average daily procedures - Before dental therapist	6.5	0.0	29.2	15.4	2.9	0.0	16.9	13.6	0.0	63.1
Average daily procedures – After dental therapist	6.7	2.0	29.4	14.3	4.7	9.7	15.9	14.0	9.7	70.9
Difference	0.2	2.0	0.2	-1.1	1.8	9.7	-1.0	0.4	9.7	7.8

Note. Averages shown are based on the number of days worked by each provider. Dentist 2 retired one month after the dental therapist was hired, working only 4 days during that time period, compared with 76 days worked by Dentist 1.

Gross revenues

Average daily gross revenues are computed by dividing the total gross revenues generated by each provider by the number of days worked before and after adding the therapist. Revenues are computed from office fee collected by type of procedure and the number of procedures performed.

- Average daily revenues increased from \$6,275 to \$6,948 after the addition of the dental therapist and the loss of a dentist due to retirement, net increase of about 10 percent.
- Total gross revenues for the 5 month period studied increased by \$14,869, an increase of about 3 percent. Because one doctor retired during the period studied, revenues suffered a decline that would not have occurred with a fully-staffed office.

2. Average daily gross revenues by provider, before and after dental therapist

	Assistant	Dentist			Dental Therapist	Hygienist			All providers
		(1)	(2)*	(Ortho)		(1)	(2)	(Temp)	
Average daily fees – before dental therapist	\$287	\$4,273	\$1,788	\$22	\$0	\$989	\$842	\$0	\$6,275
Average daily fees - after dental therapist	\$376	\$4,223	\$824	\$6	\$1,128	\$978	\$875	\$637	\$6,948
Difference	\$89	-\$50	-\$965	-\$16	\$1,128	-\$11	\$32	\$637	\$673

Note. Averages shown are based on the number of days worked by each provider. Dentist 2 retired one month after the dental therapist was hired, working only 4 days during that time period, compared with 76 days worked by Dentist 1.

3. Total gross revenues

Total gross revenues - before dental therapist	\$527,059
Total gross revenues – after dental therapist	\$541,928
Difference	\$14,869

Variance analysis

Total gross revenues and cost of the office (all providers), before and after dental therapist

- The total gross revenues increased by \$14,869 after adding the dental therapist, while the total costs of the office went down during the period studied by \$15,515. The total variance was \$30,384.

This suggests that the dental therapist position is financially viable under the current staffing conditions. The retirement of the doctor during the period studied influenced this result (reducing costs, but also reducing gross revenues). Yet, from the pattern of productivity changes for doctors and hygienists, the impact of the dental therapist under a fully-staffed office may still be positive.

- It can be presumed that as time passes, the substitution of procedures performed by the therapist that are usually done by a dentist would increase the marginal revenues and lead to larger gross revenues for the office. The opposite case would occur if the therapist assumes procedures typically done by lower-paid staff and thus reduce financial efficiency. In other words, the dental therapist position is more cost-effective as long as the dental therapist performs procedures typically done by dentists or higher paid providers.

4. Variance

Additional total gross revenues (5 months)	\$14,869
Additional costs	(\$15,515)
Variance	\$30,384

Direct gross revenues and cost of dental therapist, before and after dental therapist

- When analyzing the direct gross revenues produced by the dental therapist and his direct cost during the period studied (salaries and benefits), we observe a positive variance of \$48,652.
- The dental therapist's direct costs include wages, health benefits, and estimated overhead.

5. Direct variance of dental therapist position

Gross revenues generated by the dental therapist (5 months)	\$84,632
Costs associated with the dental therapist (5 months)	\$35,979
Variance	\$48,652

Note. The 5-month therapist's cost is based on average monthly salary and wages of \$4,922 (about 7% in benefits), and an estimated overhead cost of \$3,248 per full-time equivalent. The therapist works 28 hours per week.

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