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System Transformation:

A Three Domain Framework to Innovating Oral Health Care

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For decades, dentistry's predominant approach to care has been invasive procedures that are reimbursed by dental insurance payors as fee-for-service. Many industry leaders recognize this approach lacks concordance with changing care delivery and reimbursement which is person-centered, value-based, and prevention-oriented. As a result, oral health care advances have lagged compared to other measures of health status. A more distinct and recharged dental care model is needed for these times. We propose an expanded model for primary and secondary prevention using emerging technology and transformative methodology. This promising new oral health^a model will be cost-effective, efficient, and more equitable. The Three Domain Framework builds on health promotion and disease prevention while supporting value-based care. Through an analysis of projected Medicaid costs, this paper describes a new "Three Domain Model for Dentistry" with a roadmap for implementation.

Background

Dentistry has long been a profession ripe for disruption. Dental care delivery has disproportionately focused on invasive intervention and a fee-for-service payment model that leaves many people lacking access to quality care. The COVID-19 pandemic has catalyzed an overdue and necessary structural change within dental care delivery. As shelter-in-place orders from state governments closed or significantly limited the operation of dental offices, dental care teams invested in virtual care in response to urgent needs. Dental offices adapted to numerous challenges in reopening their doors. Subsequently, providers have implemented new infection control procedures including aerosol management^b protocols as well as social distancing to reestablish trust in the safety of care.

Most private dental practices essentially operate as small businesses. Recent commentaries suggest that small businesses should now consider aligning financial strategies

with start-up models: flexibility with consumer needs, rapid adaptation to the marketplace, creative problem-solving, diversifying funding streams, consolidating partnerships, and innovative delivery of services.¹⁻⁴ Prior to COVID-19, alternative dental payment models were starting to receive acceptance as increased convergence between medicine and dentistry coupled with health care payment reform changed consumer and provider desires. Additionally, increased awareness of socioeconomic and racial inequities continue to challenge the norms of traditional dental care delivery.⁵⁻²⁵ Ultimately, the COVID-19 pandemic has exposed how incompatible the last-century dental operating model is with the evolving political, economic, and public health environment in the 21st century. In its wake, nations face an imperative to reconfigure the organization, financing, and delivery of oral health care.

^a Oral health is a fundamental component of health and physical and mental well-being. Oral health is multi-faceted and includes the ability to speak, smile, smell, taste, touch, chew, swallow, and convey a range of emotions through facial expressions with confidence and without pain, discomfort and disease of the craniofacial complex (FDI World Dental Federation).

^b A dental aerosol is an aerosol that is produced from dental instruments, dental handpieces, three-way syringes and other high-speed instruments. These aerosols are a suspension of fine solid particles or liquid droplets in air or another gas.

Purpose and Significance

Operationalizing Three Domains to Enhance Oral Health

The Three Domains Framework creates a structure that incorporates primary and secondary care for oral health care delivery. This structure facilitates value-based payment models and enables patients to invest in their oral health. The Three Domain framework forms an interdependent care environment that prioritizes prevention but provides oral health providers and the patient an ability to determine the treatment that best meets the patient's needs. Care teams can tailor the domain approach to the specific needs of the patient while leveraging opportunities for whole-person health. By prioritizing primary care and prevention through Domains One and Two, whole-person health is deeply integrated into the care delivery process.

Tele-Prevention



Domain One builds an accessible, convenient, evidence-based virtual care approach to accompany in-person oral health care delivery using technology for enhanced disease prevention and whole-person health.

Minimally Invasive Care



Domain Two focuses on minimally invasive care that reverses or slows early disease stages using a program of anticipatory guidance and collaborative decision-making with patients.

Integrated and Personalized Care



Domain Three introduces personalized oral health care that prolongs the life of hard and soft tissues by reducing tooth/tissue mortality through risk stratification and medical-dental integration using predictive analytics and safe, individualized surgical intervention.

The domains approach introduces an elevated model of dental care that emphasizes patient and provider safety while addressing crucial gaps in both financial viability and inequitable access to care. The Three Domain Model for Dentistry achieves the following:

1. Encompasses three nonlinear domains of oral health investment that facilitate financial viability and improved population health.
2. Emphasizes the need for safe, sustainable, and diverse business models that prioritize patient health and wellness.
3. Facilitates the capacity of hybrid^c teledentistry models to effectively coordinate care for underserved, poorly served and never served communities.
4. Centers personalized care based on individual disease process rather than a one-size-fits-all “repair and replace” model.
5. Encourages systemic interprofessional changes in oral health care delivery to mitigate health inequities.
6. Evolves and expands patient choice through care innovations and technology enhancement.

^c A way of working, organizing, or doing something that is composed of elements of two separate systems. In this case, in-person prevention visits joined with teledentistry visits to improve overall oral and general health.

The proposed framework is nested^d and nonlinear, meaning oral health care teams can choose any one of the three domains as a place to begin based on needs and capability. This flexibility enables providers to explore a new model of dentistry by starting with a domain that supports the comfort and experience of the care team. These domains of care support the spectrum of clinical care delivery, but call for increased investment in the elements of Domains One and Two given the current reimbursement and design structures in dentistry. Care teams and stakeholders should tailor the domain approach to the specific needs of the patient consistent with the quadruple aim.^e The following evidence-based resources informed the domain framework:

- **Predictive models:** Professional organizations and actuarial firms show a decline in utilization of traditional dental care as well as an increase in personalized care delivery;²⁶⁻³⁰
- **State budgets:** A COVID-19 pandemic-related decrease or stagnation in state Medicaid budgets coupled with increases in Medicaid enrollment;³¹⁻³²
- **Health care spending:** Higher utilization and lower overall health care spending from value-based dental care models that reduce medical costs by keeping patients out of the emergency department and augmenting chronic disease management;^{15,33-35}
- **Health care delivery:** Financial and care delivery changes that have been accelerated by the pandemic;³⁶⁻³⁹ and
- **Workforce:** Dental teams should be centered on the proficient and efficient delivery of preventive care. Interprofessional care teams should value whole-person health to reduce negative health outcomes through needs-based service planning.^{f, 40-41}

Central to the Three Domain Framework is an understanding of economic, social, and political factors associated with oral health care delivery. These factors influence utilization, shift the regulatory environment, change consumer habits, increase cost and liability, and affect the development of technology (e.g., artificial intelligence, HIPAA compliance, and interoperability of electronic health records). The changing financial environment in state and federal insurance because of the economic downturn that resulted from the COVID-19 pandemic and the loss of coverage in Medicaid/Medicare/Dual programs will force innovation in oral health care delivery that increases access

while controlling costs. Existing accountable care organizations (ACOs), managed care groups, and dental service or care organizations have successfully used value-based care models to sustain population health while reducing the cost of quality care and engaging patients to be actively involved in their health.^{4, 15, 18, 42-49} Therefore, we reviewed existing value-based oral health care (VBOHC) models to inform the design of the domains. This methodology can allow dental practices to be more competitive in a multi-payer environment based on best practices from current alternative payment models (APMs)^g and VBOHC operations.

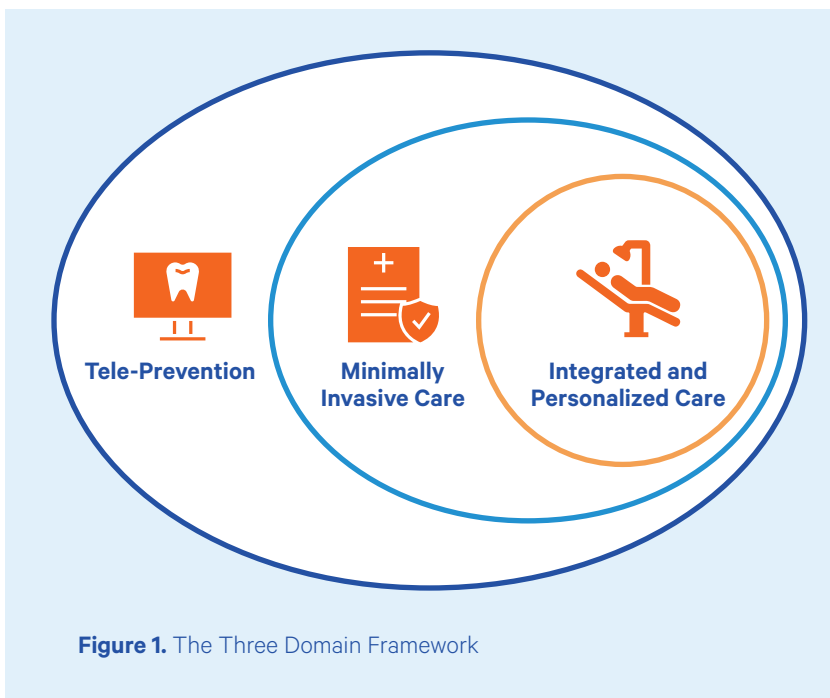


Figure 1. The Three Domain Framework

^dReferring to a paradigmatic framework in which components are all interlinked, but at times it is useful to focus on these aspects in relation to each other.

^eThe vernacular used when the satisfaction and business model support of clinical care teams is considered in addition to the other goals of the Institute for Healthcare Improvement's (IHI) Triple Aim: better health outcomes, reducing per capita cost of health care, and increased satisfaction with the care experience.

^fNeeds-based service planning include the utilization of health workforce planning with human resource strategies and alignment of health services to account for a population's needs for health and health care.

^gAPMs involve a range of reimbursement or payment structures that utilize either a fee-for-service or capitation payments with incentives to achieve measurable health goals.

Social Determinants of Health and Healthy Communities

Considering the social determinants of health (SDOH)^h is crucial to creating thriving, healthy communities. These factors affect the success in implementing the Three Domains framework. Examples of oral health SDOH include socio-economic indicators such as access to affordable healthy food and reliable transportation, language proficiency, immunization status, literacy, previous dental care, educational attainment, citizenship status, and stable housing.⁵¹ Addressing the social risk factors adjacent to the SDOH are important when identifying barriers to optimal oral health.ⁱ Over the lifespan, SDOH influence as much as 60–80% of health outcomes, and contribute to significant disparities across populations.⁵¹⁻⁵³ As the dental health care system increasingly uses data to improve processes, outcomes, quality, and value within clinical settings, providers should understand the significant role nonclinical factors have in influencing patient outcomes.

Oral health providers can maximize the care experience by recognizing the social, financial, linguistic, or time barriers experienced by patients. As care teams seek to capitalize on their role within a value-based model of care, they should focus on the social drivers of health outcomes. Without considering the upstream^j factors that impact patients, quality improvement efforts may not fully achieve intended outcomes. Teledentistry can help address SDOH by reducing barriers to health related to transportation, time needed to have an oral health service, availability of oral health services in the local community, and integration of oral health services with general and social service systems. Teledentistry standards of practice should include the coordination of care between dental providers, other health care providers, community health workers, case managers, and language interpreters.⁵⁴⁻⁵⁵ To this end, care teams, oral health networks, and health care payors should create SDOH referral networks and health information exchanges that prioritize whole-person health needs, including oral health, in the health care delivery system. When critical social services and environmental supports are inaccessible, there may be opportunities to explore innovative partnerships

As care teams seek to capitalize on their role within a value-based model of care, they should focus on the social drivers of health outcomes.

for necessary structural changes that advance whole-person and communal health. This stakeholder interaction not only could increase patient access to oral health education, prevention, and other oral care services, but also could result in improved whole health outcomes by expanding upon the medical and dental home concepts through enhanced collaborative and coordinated care efforts. Oral health professionals and stakeholders should advocate for a system that prioritizes and supports providers who care for patients with the heaviest disease burden.

^h The Centers for Disease Control and Prevention (CDC) defines social determinants of health as conditions in the places where people live, learn, work, and play that affect health risks and outcomes.

ⁱ [Social risk factors](#) are defined as “the adverse social conditions associated with poor health, such as food insecurity and housing instability.”

^j According to the Rand Corporation, upstream factors refer to the macro factors that comprise social-structural influences on health and health systems, government policies, and the social, physical, economic, and environmental factors that determine health.



Domain One: Tele-Prevention

Domain One Clinical Guidance

Domain One's primary focus is to build an accessible, convenient, evidence-based virtual framework for oral health care centered on disease prevention and whole-person health. The proposed interdependent domains of care delivery rely on increased adoption of teledentistry to accelerate prevention and disease management, but cannot completely replace in-person encounters. Teledentistry bolsters current prevention and healthy behavior strategies used to improve the health of individuals. As a component of telehealth, teledentistry can support integrated, wholistic care in conjunction with other health professionals (e.g., medical providers, mental health

Teledentistry bolsters current prevention and healthy behavior strategies used to improve the health of individuals.

providers, etc.).⁶⁰ Eventual best practices will use telehealth capabilities to enhance risk-based prevention during in-person oral health and dental care delivery.

Before the COVID-19 pandemic, safety net providers were the primary users of telehealth, and most dental providers did not incorporate teledentistry into their practices. Teledentistry has historically struggled with adoption because of reimbursement policies, state and supervision regulations, lack of accessible technology, real and perceived lack of use cases, and an elusive business model. As COVID-19 drove care teams to reduce direct patient contact, use of teledentistry initially increased to maintain provider-patient connection (although it has subsequently diminished significantly as dental offices reopened). Consequently, several states either created or expanded temporary or permanent teledentistry regulations. The movement toward adoption of teledentistry in the wake of COVID-19 presents opportunities to reengineer the traditional care pathway toward oral health promotion and disease prevention.⁵⁶⁻⁵⁹ The novel modality and variation in regulation (currently only 20 states have specific teledentistry policies) necessitates additional guidance related to teledentistry.⁶¹

This section will consider three components^k of telehealth in dentistry: 1) synchronous^l urgent visit, 2) synchronous prevention visit, and 3) asynchronous^m prevention visit.

Component One: Synchronous Urgent Visits

Synchronous urgent care visits use telehealth-enabled communication for providers to remotely assess and triage patients with dental emergencies. Urgent or emergent visits can be leveraged as a gateway for patients to establish a dental home and a pathway for prevention opportunities. Providers can determine the appropriate care location, interventions, and treatment plan without needing physical contact. Recent data from the American Dental Association's Health Policy Institute indicated that approximately 40% of patients with urgent telehealth needs did not require an in-person emergency treatment.²⁸ Similarly, the DentaQuest Partnership in December 2020 determined that 65% of

procedures performed during initial in-office emergency visits involved only diagnostics, and less than one-third needed restorations or tooth removal.^{n, 63} Synchronous consultations can allow providers to prescribe medications and appropriate treatment, which may avert more costly and disruptive visits to hospital emergency departments. Convenient access to a dental provider, coupled with avoiding unnecessary in-person visits (both to a dental office or hospital emergency department), make virtual encounters for urgent care a prime target for expansion. The CDT Code Packages^o related to a synchronous urgent visit are displayed in Table 1.

Component Two: Synchronous Prevention Visits

Synchronous prevention visits focus on evaluating health status for disease prevention using a teleprevention model (Table 2). Virtual visits can be a beneficial tool for the provider and community, especially when community health workers are

Table 1. CDT Code Packages for Synchronous Urgent Visits

Synchronous Urgent Visits – Code Packages		
Teledentistry CDT Code:	Variations of the following CDT Codes:	
D9995 teledentistry — synchronous; real-time encounter Reported in addition to other procedures (e.g., diagnostic) delivered to the patient on the date of service.	D0140 – Limited oral evaluation, problem focused	
	D0160 – Detailed and extensive oral evaluation	
	D0170 – Re-evaluation — limited, problem focused (established patient, not post-operative visit)	
	D0171 – Re-evaluation — post-operative visit	
	D0190 – Screening of a patient	
	D0191 – Assessment of a patient	
	D9992 – Dental case management — care coordination	
	D9994 – Dental case management — patient education to improve oral health literacy	
	D9311 – Consultation with a medical health care professional	
• Limited to patients of record	• Limited to 1 per 6 month period	• Limited to patients who have not had a D150 in previous 12 months

Table 2. CDT Code Packages for Synchronous Prevention Visits

Synchronous Prevention Visits – Code Packages		
Teledentistry CDT Code:	Variations of the following CDT Codes:	
D9995 teledentistry — synchronous; real-time encounter Reported in addition to other procedures (e.g., diagnostic) delivered to the patient on the date of service.	D0601 – Caries risk assessment, low risk	
	D0602 – Caries risk assessment, moderate risk	
	D0603 – Caries risk assessment, high risk	
	D0190 – Screening of a patient	
	D0191 – Assessment of a patient	
	D1310 – Nutritional counseling for control of dental disease	
	D1330 – Oral hygiene instructions	
	D9992 – Dental case management — care coordination	
	D9994 – Dental case management — patient education to improve oral health literacy	
• Limited to patients of record	• Limited to 1 per 6 month period	• Limited to patients who have not had a D150 in previous 12 months

^k We acknowledge that while this paper focuses on these three specific applications, there are others that may help dental practices diversify their mix of services.

^l Synchronous refers to the delivery of health information in real time. This allows for a live discussion with the patient or provider to deliver medical expertise.

^m Asynchronous refers to the “store-and-forward” technique, where a patient, dentist or dental hygienist collects medical history, images, and care reports or assessments and then sends it to a dentist or dental specialist for diagnostic and treatment expertise.

ⁿ This analysis used IBM Watson National Medicaid MarketScan (pre-COVID-19) data.

^o A group of codes, often used to designate payment for services, can be grouped or bundled into a package for all the all the services performed to treat a patient undergoing a specific episode of care. An episode of care is the care delivery process for a certain condition or care delivered within a defined period of time.

effectively integrated in the process. In populations struggling to access dental care, synchronous teledentistry can provide more consistent connection with the dental provider. Through teleprevention, providers can conveniently evaluate and triage dental disease to achieve improved patient management. Patients who cannot access routine diagnostic and preventive dental care risk worsening undetected dental disease, potentially resulting in a dental infection and unnecessary use of emergency departments.

This synchronous encounter is proactive and scheduled rather than a reactive urgent telehealth visit. The integration of primary care and inclusion of health coaching creates opportunities for oral health care teams to adopt these procedures for improved population health.^{59, 63-64} Providers can gather important information in a teledentistry portal to help patients understand their risk for oral disease and to promote good oral health through patient education and health coaching.⁶⁵ Synchronous visits also create a pathway toward integrated, interprofessional care. The technology can provide the patient with a more interactive care experience with an interdisciplinary team that meets health wants and needs.

This interprofessional operational model can support health information exchanges by synchronizing health records between providers, using common data to diagnose and treat, and facilitating seamless referrals. Advancing health information technology can reduce medication errors and improve treatment outcomes in all health fields.

Component Three: Asynchronous Prevention Visits

Asynchronous preventive visits can expand the reach of providers into communities where their residents do not readily have access to oral health care and provide more convenient and safer services even for those who have, in the past, received regular in-office care. As seen in Table 3, the visit often includes a patient assessment, radiograph or photographic documentation for referral, oral hygiene instructions, a caries risk assessment, a fluoride application, and a prophylaxis^p with sealant^q placement. A dentist electronically evaluates the shared documents and images to develop a treatment plan. Later, the findings and treatment plan are communicated back to the patient for discussion and finalization. Asynchronous visits improve access to care, support those at high risk for disease progression, and facilitate convenient dental care.⁶⁷⁻⁷⁰

Teleprevention in Dentistry: Next Steps and Conclusion

States need to enact permanent policy changes to sustain the teledentistry infrastructure created during the COVID-19 pandemic temporary emergency orders. Broadband infrastructure and financial capital for dental facilities to purchase technology is especially important in rural and underserved areas. About 24 million households lack access to fast and reliable broadband internet; 80% of those households reside in rural communities.⁷⁰⁻⁷² This widens an already sizable gap in equitable access to care. Telehealth services could be challenging in low-income communities given unreliable internet services and low health literacy. Despite these challenges, many primary care health clinics in rural and

Table 3. CDT Code Packages for Asynchronous Prevention Visits

Asynchronous Prevention Visits – Code Packages		
Teledentistry CDT Code:	Variations of the following CDT Codes:	
D9996 teledentistry — asynchronous; information stored and forwarded to dentist for subsequent review Reported in addition to other procedures (e.g., diagnostic) delivered to the patient on the date of service.	D0601 – Caries risk assessment, low risk	
	D0602 – Caries risk assessment, moderate risk	
	D0603 – Caries risk assessment, high risk	
	D0190 – Screening of a patient	
	D0191 – Assessment of a patient	
	D0210 – Intraoral — complete series of radiographic images	
	D0250 – Extraoral — 2D projection radiographic image created using a stationary radiation source, and detector	
	D0274 – Bitewings — four radiographic images	
	D0330 – Panoramic radiographic image	
	D0350 – 2D oral/facial photographic image obtained intra-orally or extra-orally	
	D1206 – Topical application of fluoride varnish	
	D1208 – Topical application of fluoride	
	D1330 – Oral hygiene instructions	
<div>• Limited to patients of record</div> <div>• Limited to 1 per 6 month period</div> <div>• Limited to patients who have not had a D150 in previous 12 months</div>		

^p A dental prophylaxis is a professional cleaning procedure performed to thoroughly clean the teeth and mitigate disease development or progression.

^q A thin coating of plastic or other material to protect the pits and fissures on the chewing surface of the teeth from developing cavities.

underserved areas are acquiring telehealth capabilities to consult with other medical health providers and specialists (e.g., mental health, cardiologists, diabetes specialists, etc.). Oral health providers can leverage this increased capacity by developing an “on call” or consulting relationship if the facility does not have an on-site oral health provider. Patients can receive oral health education, evaluation, triage, and referral from a dental provider using teleprevention when the patient is at their medical facility. Some forward-thinking health care systems are evaluating an integrated, wholistic telehealth experience in which a patient could receive an oral health screening during a medical care encounter and be transferred immediately to an oral health provider for evaluation, education, and care coordination⁷¹⁻⁷²

Domain One Cost and Financial Implications

Teledentistry has demonstrated monetary advantages, including patient retention, better value for time spent, reduced overhead costs, and decreased liability. For a system of care to be successful and its participants to understand risk, overall investment from payors and the level of revenue providers can expect should be transparent. The opportunity of teledentistry as a tool for disease prevention holds the most promise in a value-based care design, like shared risk or global budgeting, in which cost savings is necessary to meet financial needs. A breakdown of the component codes associated with telehealth visits is provided, as previously described, including the synchronous urgent visit and the synchronous and asynchronous preventive visit. CDT code combinations are used, along with assumptions/limits on the number of visits and utilization, to estimate the cost and financial implications for businesses operating in a mixed-payor structure. Table 4 summarizes these cost and financial implications of the Domain One code packages for reimbursement and finance (Appendix A). The following section includes details of those implications.

Table 4. Summary of the Financial Implications of Domain One: Oral Health with Teledentistry

	Synchronous Urgent Visit		Synchronous Prevention Visit		Asynchronous Prevention Visit	
	Children	Adults	Children	Adults	Children	Adults
Care Package PMPM Estimate at Average Utilization	\$0.23	\$0.26	\$5.63	\$1.88	\$9.19	\$3.08
Estimated Reimbursement Per Visit	\$99.54	\$74.96	\$56.54	\$75.09	\$123.10	\$163.50
Range of Estimates Based on Variations in Utilization	\$0.23-\$0.33	\$0.18-\$0.26	\$0.63-\$6.26	\$0.47-\$2.83	\$1.02-\$10.22	\$0.77-\$4.62
Range of Estimates Based on Variations in Fee Schedules	± 29%	± 29%	± 32%	± 32%	± 8%	± 8%
Current National Average PMPM for In-Office Visits	\$0.64	\$0.58	\$13.45	\$3.99	\$13.45	\$3.99

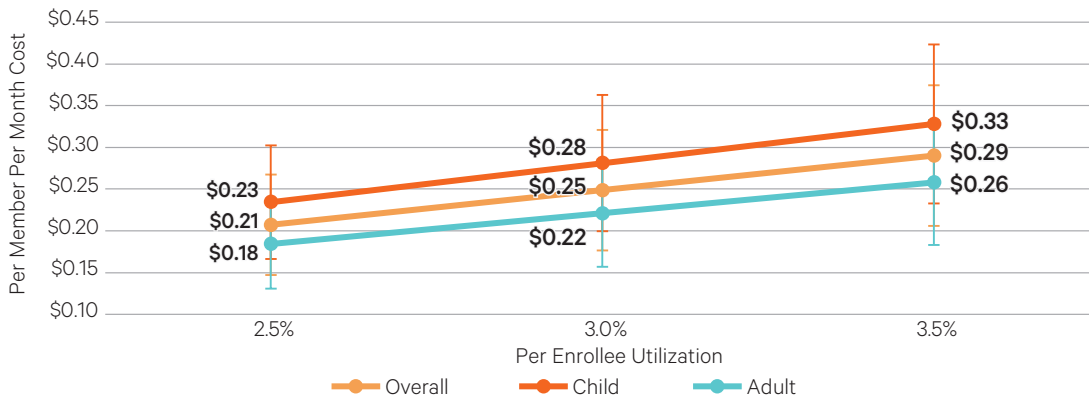


Figure 2. PMPM Cost of Synchronous Urgent Visit

Financial Implications:

Synchronous Urgent Telehealth Visit

The emergency telehealth visit may include oral evaluations, screening, assessment, and case management. In order to receive reimbursement from a payor, the provider would use a service code package (Table 1). Several data sources were used to evaluate these proposed coding scenarios^f (see Methodological Appendix). The estimated per member per month (PMPM)^g cost is \$0.23 for children with 2.5% utilization, and 1.13 visits per year^h and \$0.26 for adults with a utilization of 3.5% and 1.18^u visits per year. Estimates range from \$0.18 to \$0.33 PMPM across varying utilization and ages of patients (Figure 2). Implementing a package structure^v correlates to an average Medicaid reimbursement fee of \$99.54 for children and \$74.96 for adults. For comparison, national Medicaid data^w reveals that most state agencies see a cost of \$0.64 PMPM or \$270 per visit for in-person child emergency dental services, and \$0.58 PMPM or \$167 per visit for in-person adult dental emergencies. It will be important for payors and oversight entities to continue monitoring waste, fraud, and abuse with the implementation of this approach.

Time per Encounter, Expense, and Clinic/Staff Productivity



It is still unclear how the time and expenses associated with each component of patient encounters will affect staff productivity and profitability. In medicine, the models of time, expense, and productivity are combined in a concept called Relative Value Units (RVUs), which rank the resources used to provide each service on a common scale. Provider RVUs, practice expense RVUs, and (in medicine) malpractice RVUs are common units of assessment. While RVUs are tied to procedure codes in dentistry, we do not extensively consider these factors given the conflicting evidence on the time and expense associated with telehealth, coupled with limited evidence regarding how bundling these services will impact productivity.

Box 1. Time Per Encounter, Expense, and Clinic/Staff Productivity

^f Reports utilized include: National Dental Advisory Service (NDAS) fee report for 2020, average Medicaid reimbursement rates, information on emergency dental visits in Medicaid, and enrollment in Medicaid and CHIP.

^g Per Member Per Month (PMPM) applies to a revenue or cost for each enrolled member each month. The number of units of something divided by member months is often used to describe premiums or capitated payments to providers, but can also refer to the revenue or cost for each enrolled member each month.

^h Children (aged 20 and younger) and adults (aged 21 and older) are treated separately under state and federal law, and many states have separate fee schedules for those groups.

^u These utilization and visits per year metrics correspond to national estimates of utilization for corresponding service categories. For example, 2.5% of all adults enrolled in Medicaid have an emergency or urgent dental visit in a year and they have, on average, 118 visits per year.

^v A payment structure in which different health care providers who are treating you for the same or related conditions are paid an overall sum for taking care of your condition rather than being paid for each individual treatment, test, or procedure.

^w Based on an analysis of the IBM Watson Medicaid Watson database for 2017.

Financial Implications:
Synchronous Urgent Telehealth Visit

As seen in Table 2, a synchronous teledentistry code is paired with an oral health risk assessment to determine the timing of and frequency with which the patient should seek in-office care. Figure 3 shows PMPM fees that include one telehealth visit every six months and utilization rates of 5–50% of those enrolled (see Methodological Appendix). Each packaged care visit would correlate to an estimated reimbursement of \$56.54 for children and \$75.09 for adults. For comparison, national Medicaid data reveals that most state agencies see a cost of \$13.45 PMPM or \$189.41 per visit for preventive and diagnostic services among children and \$3.99 PMPM or \$172.81 per visit among adults.

The caries risk assessment is a core element of the synchronous prevention visit. This tool helps providers categorize patients by risk and create personalized treatment plans related to risk level. The combination of the telehealth visit, a caries risk assessment, and a personalized treatment plan streamlines the patient experience. In addition, this combination lowers costs by tailoring revisit cycles to patient needs and increases provider engagement with high-risk patients (Appendix B).

Financial Implications:
Asynchronous Evaluation and Management Visit

Projected PMPM fees are outlined in Table 2 include one asynchronous prevention visit every six months; utilization rates of 5-50% of those enrolled were calculated (see Methodological Appendix for calculation description). With 1.5 visits annually and 50% utilization across all ages, the PMPM cost is \$10.22 for children at 50% utilization and \$3.08 for

adults at 50% utilization (Figure 4). Each visit would provide dental care teams a reimbursement of \$123.10 for children and \$163.50 for adults based on an oral hygiene encounter and a review by a dentist or specialist.

A DQP analysis of a large dental care organization operating within a current value-based care model* and employing asynchronous teledentistry demonstrated cost savings associated with this package. A review of 1,516 asynchronous teledentistry visits conducted in an oral hygiene program during 2019 demonstrated that the average dental treatment cost for patients, adjusted within a usual, customary, or reasonable (UCR) fee schedule and following the use of this asynchronous prevention telehealth package is \$483 compared to \$593 for other dental treatments performed within an office setting. The difference in cost is largely attributed to a reduced need for repetitive diagnostics with expanded minimally invasive care, resulting in fewer restorative and surgical procedures. Taken together, we can conclude asynchronous telehealth oral hygiene visits are an effective solution for providing appropriate care within this VBOHC model.

The broad implementation of asynchronous visits can potentially reduce per patient costs. For patients unable to travel to central clinical sites, this tactic increases access to diagnostic and preventive care. Asynchronous visits may also reduce associated staff and chair time by shifting some patients to telehealth visits. Operational streamlining associated with examinations and obtaining images opens chair time for surgical intervention and expands hours of operation.

PMPM Cost of Synchronous Disease Prevention Telehealth Visit

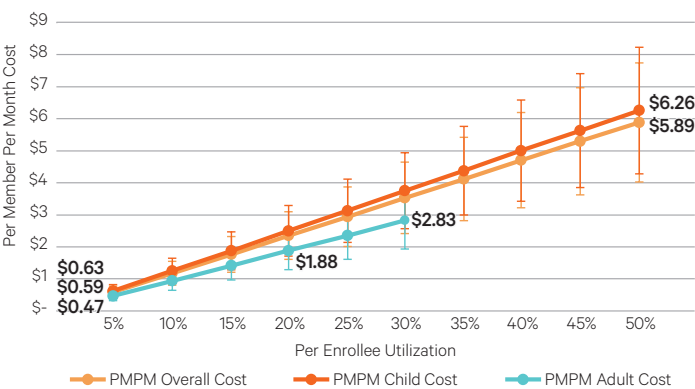


Figure 3. PMPM Cost of Synchronous Disease Prevention Telehealth Visit.

PMPM Cost of Asynchronous Preventive Visit

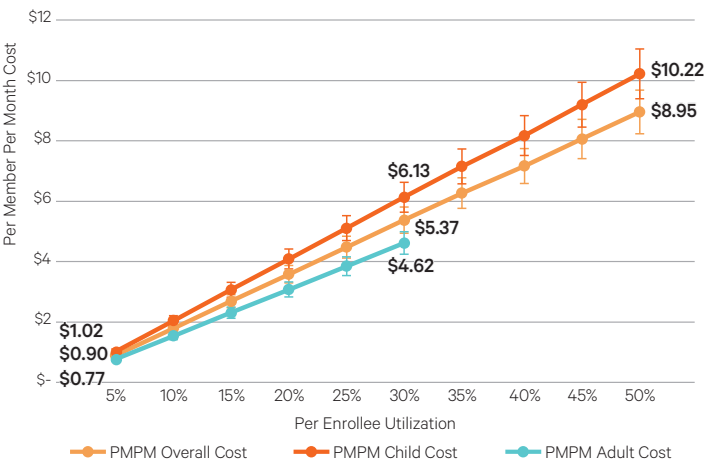


Figure 4. PMPM Cost of Asynchronous Preventive Visit

* Advantage Dental: <https://www.advantagedental.com/>.

Domain One Advantages for Patients, Dental Health Care Workers, and Payers

Advantages for Patients

The urgent teledentistry visit provides on-demand access to care when patients need to address acute issues. Currently in dentistry, health assessment and coaching are often associated with community-based programs, involving some form of oral health risk assessment.

Disease prevention and health promotion teleprevention visits, like nutritional guidance and tobacco cessation counseling, can reduce disease risk, particularly within marginalized and vulnerable communities. Data reinforce that a primary care^y approach initiated within a dental-based encounter can result in all of the following benefits to patients: improved home tooth-brushing habits; reduced high-risk behavior associated with oral diseases; positive views toward preventive dental screenings; reduced new caries experience; improved treatment outcomes; decreased emergency department utilization for nontraumatic dental care; and a healthier oral microbiome.^{z, 73-91}

The synchronous teleprevention visit, represented through a service code package (see Appendix A), can include a caries risk assessment, screening, counseling, anticipatory guidance, and case management to improve chronic disease conditions. In a survey assessing patient experience with synchronous visits, 86% of participants expressed general satisfaction and would use the medium again.⁹² Results also revealed significant time savings for patients, with the potential to reduce no-show rates:

- 52% of respondents reported that they would need to travel to another city to see a dentist if they hadn't used teledentistry;
- 42% said they would have had to take time off work; and
- 28% of respondents reported they would have needed to find childcare to get in-person care.

Advantages for Dental Health Care Workers (DHCWs)

An analysis of *asynchronous* teleprevention encounters performed for this paper demonstrates that the care provider did not immediately identify a need for a subsequent patient visit. Our analysis of asynchronous teledentistry encounters from a large dental care organization operating within a value-based care model indicated only 24%^{aa} of patients returned within 30 days, and another 23% returned for any

Disease prevention and health promotion teleprevention visits, like nutritional guidance and tobacco cessation counseling, can reduce disease risk, particularly within marginalized and vulnerable communities.

reason within six months following the oral hygiene visit. Among the 24% that did return within 30 days, roughly half returned for a restorative or oral surgery visit that finalized treatment, higher than average among patients without a teledentistry visit. It is important to note that only 14% of patients returned for an emergency visit, which is comparable to the typical rate for patients. This outcome illustrates how the asynchronous visit can facilitate access to care and does not delay needed care or increase risk to patients.

Temporary rollbacks of regulatory restrictions from all legislative levels in response to the COVID-19 pandemic enabled dental providers to implement virtual care models for patients. This global attention provides a clear pathway for teledentistry. State government agencies, stakeholders, and institutions can use data collected during this time to elevate dental care delivery now and for the future. Telehealth care platforms can expedite chair time or dentist availability for pre-operative consultation, post-care follow-up, or referral management.⁹³⁻⁹⁴ Fewer in-person visits during COVID-19 reduces risk of transmission for patients and providers, thereby facilitating safety and efficacy in dental care while alleviating fear and anxiety experienced by providers during the pandemic.⁹⁵⁻⁹⁶ A [recent report](#) suggests patients are receptive to telehealth visits and find value in connecting with their dental care team, which can lead to improved provider satisfaction.

^y Primary care is the day-to-day health care given by a health care provider acting as the principle point of continuing care for patients within a health care system. Secondary care is more specialized and focuses on helping patients who are struggling with more severe or complex health conditions often focused on reducing the need for surgery. Tertiary care is a level of health care obtained from specialists or requiring surgical care usually after referral from the providers of primary and secondary care.

^z The collective genome of microorganisms that reside in the oral cavity. After the gut, it is the second largest microbial community.

^{aa} N=363

Advantages for Payors

A robust teleprevention program that reduces unnecessary in-person visits creates safer oral health encounters, mutually benefiting the payor, provider, dental care organizations, and patients. Because payors are under pressure by their clients to improve access, enhance provider networks, and integrate care at lower costs, they can drive the adoption of teledentistry strategies to address client demands. Previous analyses indicate that teledentistry visits improve health, costs, access, and utilization for those in rural areas, school-based settings, and nursing or assisted living communities.^{67, 97-99} Diversifying access to care through teleprevention means patients come into an office only when treatment is truly needed while still receiving appropriate assessments and care management. Supporting patient evaluation on a routine basis through teleprevention oral hygiene visits builds success with at-home care and lowers risk of disease. Using this risk-stratified model, some patients may only need a an oral hygiene appointment once per year, resulting in cost-savings for patients and payors. Increased use of teledentistry expands dental services and provider networks, an asset for payors when competing for contracts. Heightened clinical focus on prevention ultimately creates cost savings, particularly in vulnerable communities.

A robust teleprevention program that reduces unnecessary in-person visits creates safer oral health encounters, mutually benefiting the payor, provider, dental care organizations, and patients.

^{aa} N=363

Domain One: Strengths, Weaknesses, Opportunities and Threats (SWOT^{bb}) Analysis^{56-59, 65, 100-107}

The SWOT analysis revealed the main challenges to implementing an integrated, technology-enabled prevention program include: 1) insufficient and inefficient health information technology, 2) limited long-term adoption of teledentistry policy in most states, 3) struggles with technology literacy, and 4) concerns over abuses in telehealth billing practices. Quality improvement practices, improved advocacy at both the federal and state levels, and early reports of satisfaction with technology-enabled dentistry were identified as facilitators to adoption and implementation. Collaborative and integrated approaches are needed to align multiple financial sectors for viability and sustainability.

Domain One SWOT Analysis



^{bb} A SWOT analysis is a strategic planning method utilized to categorize and evaluate strengths, weaknesses, opportunities, and threats related to project planning and success.



Domain Two: Minimally Invasive Care

Domain Two Clinical Guidance

Domain Two focuses on minimally invasive care that reverses or slows early disease stages using a program of collaborative decision-making with patients. The implementation of Minimally Invasive Care (MIC) to prevent or slow disease has been successful in community-based programs, like community health centers, childcare settings, and/or dental care sites participating in alternative payment models as well as used often in European routine dental care settings.^{72, 108-109} These programs often perform risk-stratified care^{cc} to identify and discuss health contributors with patients as part of a care team.⁸⁶ Using MIC to promote remineralization^{dd} or gains in periodontal attachment^{ee} is particularly valuable, notably at the population level, in improving systemic health and impacting cost.¹¹⁰⁻¹¹² These proactive processes promote patient wellness through management of chronic disease. In turn, this process

drives enhanced outcomes beyond today's approach of largely reactive interventions to acute pathologies. Dental public health and oral health stakeholders seek to maximize disease prevention and treatment methods that are safe, simple, effective, and affordable. These approaches should be offered in a variety of settings and by multiple members of a dental treatment team. Domain Two offers three code or service packages of oral health care delivery: ***caries prevention encounter package, the caries management encounter package, and the periodontal management encounter package.***

Evidence supports procedures that limit the use of a dental drill, including compressed air or water, microabrasion^{ff}, laser therapy, or an ultrasonic handpiece^{gg} to treat certain types of caries and periodontitis.¹¹³⁻¹¹⁹ The principle limitation for minimal aerosol-producing caries treatment is a cavitated tooth that

^{cc} Risk Stratified care management (RSCM) is the process of assigning a health risk status to a patient and using the patient's risk status to direct and improve care. The goal of RSCM is to help patients achieve the best health and quality of life possible by preventing chronic disease, stabilizing current chronic conditions, and preventing acceleration to higher-risk categories and higher associated costs.

^{dd} Tooth remineralization is the natural or agent assisted repair process for noncavitated tooth lesions or breakdown of tooth surface integrity.

^{ee} The reattachment of periodontal tissues that had been lost to periodontitis or gum disease.

^{ff} Microabrasion is a quick and painless solution for removing yellow, white, or brown spots, stains, and discolorations on the teeth.

^{gg} An ultrasonic instrument with a tip for supplying high-frequency vibrations, used to remove plaque and calculus from teeth and bits of inflamed tissue from the walls of the gingival crevice.

cannot be cleaned or the active lesion is inaccessible. All other lesions without pulpal involvement can be managed using limited aerosol production and/or with minimal or no tissue removal. While the application of many MIC agents produces fewer aerosols, providers have traditionally implemented these procedures after using the air/water syringe for cleaning and drying the tooth.¹²⁰ Even though modifications to existing protocols can reduce aerosols for some techniques to manage noncavitated lesions, the benefits or detriments of these changes are currently unknown. It will be imperative for the profession to continually monitor changes to clinically proven infection control protocols and ensure that providers implement best-evidence techniques for these products in the wake of the COVID-19 pandemic.

The COVID-19 environment propelled the need for a greater emphasis and value on less technically complex care. States and professional organizations should commit to seeking policy for acceptable reimbursement and budget appropriations in support of these interventions. State and national health agencies must address the incentivization of surgical approaches through payment reform to shift dentistry away from more expensive surgical interventions. This shift toward valuing prevention, SDOH, and better health rather than invasive treatment, volume of services, or acute care, known as VBOHC, is a critical element of oral health's future.¹²¹ VBOHC shifts from the common quantity-based payment systems

(e.g. fee-for-service) to payment models that value high-quality care and oral health outcomes.¹²² The Value-Based Care (VBC) model, already used in medicine, improves care quality and reduces wasteful spending within the overall system.¹²³ Provider reimbursement under the VBC model is designed to reduce disease burden, improve quality of care, and patient satisfaction, while ultimately lowering the cost of care.¹²⁴

Domain Two Financial Implications

The incentives of traditional fee-for-service dentistry place value on a high quota of surgical procedures and maintaining high patient volume. These incentives often reward expensive restorative care (e.g., crowns or multi-surface fillings).¹²¹ In VBOHC, monetary incentives are not associated with surgical interventions and high-volume procedures. Reducing surgical interventions not only improves patient health outcomes, but corresponds with decreased chair availability as a result of new infection control processes, social distancing, and effective aerosol management.

As described in Tables 5 and 6, Domain Two consists of three code packages that implement a minimally invasive methodology to caries prevention, caries management, and periodontal management. The PMPM cost of these packages is calculated similarly to those packages described in Domain One (see Methodological Appendix for detail) and is summarized in Table 6.

Table 5. Care Model Activities and Code Packages for Domain Two

Domain	Activities	Services
Domain 2: Minimally Invasive Care	Implement a minimally aerosol producing approach to caries and periodontal management as well as noninvasive care maintenance Care coordination and development of new business models for specialty referrals	Care intervals and minimally invasive treatment approaches reflecting individual patient risk level and needs. The following service combinations may be in conjunction with an examination (D0120, D0140, D0150, D0160, D0170) or screening (D0190 or D0191). Caries Prevention Diagnostic: D0417, D0418, D0425, D0601, D0602, D0603 Preventive: D1206, D1208, D1310, D1320, D1330 May also include: D1351 Caries Management Preventive: D1206, D1208, D1310, D1320, D1330 Restorative: D2930 (Hall Technique), D2940 Adjunctive General: D9630, D9992, D9993, D9994 May also include: D1354 Periodontal Management Preventive: D1310, D1320, D1330 Perio: D4910 Adjunctive General: D9310, D9311, D9630, D9910, D9991, D9992, D9993, D9994

Table 6. Summary of the Financial Implications of Domain Two: Minimally Invasive Care

	Caries Prevention Encounter Package		Caries Management Encounter Package		Periodontal Management Encounter Package	
	Children	Adults	Children	Adults	Children	Adults
Package PMPM Estimate at Average Utilization	\$5.78	\$2.61	\$4.11	\$4.03	\$0.17	\$7.51
Reimbursement Per Visit	\$138.80	\$104.50	\$214.20	\$161.30	\$199.60	\$174.92
Range of Estimates Based on Variations in Utilization	\$0.58-\$5.78	\$0.44-\$2.61	\$0.89-\$8.92	\$0.67-\$4.03	\$0.17-\$3.33	\$0.28-\$7.51
Range of Estimates Based on Variations in Fee Schedules	± 4%	± 4%	± 8%	± 8%	± 6%	± 6%

The **caries prevention encounter package** includes a patient examination or screening, a caries risk assessment, evaluation of susceptibility to oral diseases, oral hygiene instruction, and fluoride varnish application. Assuming one visit per year with utilization of 50% for children and 30% for adults results in PMPM costs of \$5.78 and \$2.61, respectively (Figure 5, see Methodological Appendix for details), each visit would provide dental care teams with a correlated reimbursement of \$138.80 for children and \$104.50 for adults. As seen in Box 2, sealant placement may be included in this package, depending on the type of benefit design being employed with a given plan.

Providers should utilize the caries management encounter package instead of the caries prevention package for reimbursement when identifying carious lesion(s) during an examination. The **caries management encounter package** includes a patient examination or screening, oral hygiene instruction, fluoride varnish application, minimally invasive techniques, and oral health case management. Assuming one visit per year^{hh} with utilization of 15% for children and 8% for adults, the average utilization of caries restorative services in the national Medicaid samples results in PMPM costs of \$2.68 and \$1.08, respectively (Figure 6, see Methodological Appendix for details). If the system expanded utilization to 23% for children and 30% for adults, corresponding to the rate of untreated dental caries in the population, PMPM costs would be \$4.11 and \$4.03, respectively.¹²⁸ Each visit would provide dental care teams with a correlated reimbursement of \$214.20 for children and \$161.30 for adults. As seen in Box 3, silver diamine fluoride administration as a caries arrest agent also can be included within a caries management package or plan.

Sealants



Sealants¹²⁶⁻¹²⁷ are an important modality for preventing caries in primary and permanent molars and are recommended for application on the occlusal surfaces in children and adolescents. While sealant applications cost more in the short term, they have been shown to reduce the number and severity of needed restorations and cost less in the long-term. Assuming 50% utilization, the additional estimated PMPM costs of including sealants on primary and permanent molars in the caries prevention package for children is \$1.31.

Box 2. Sealants

PMPM Cost of Caries Prevention Encounter Package

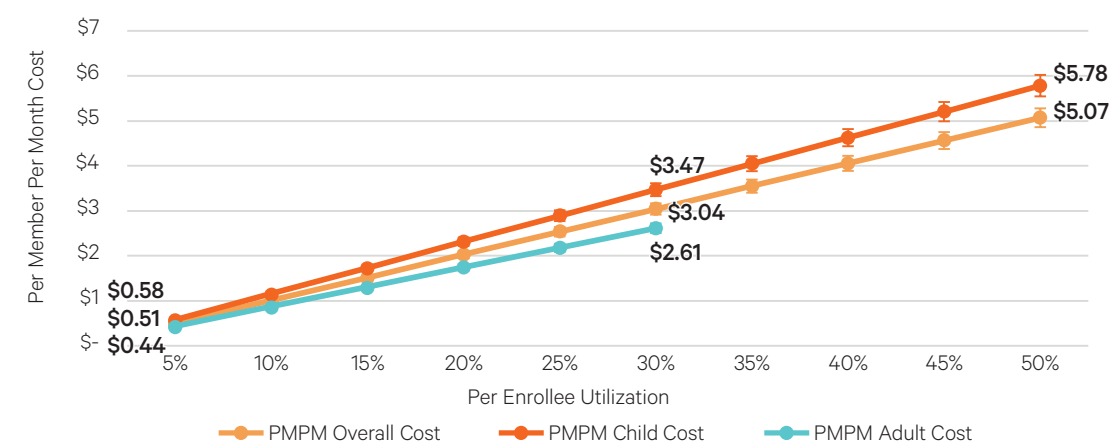


Figure 5. PMPM Cost of Caries Prevention Encounter Package

^{hh} Based on single interventions, the needed number of encounters should be determined according to local populations, scope of practice, and available budget.

PMPM Cost of Caries Management Encounter Package

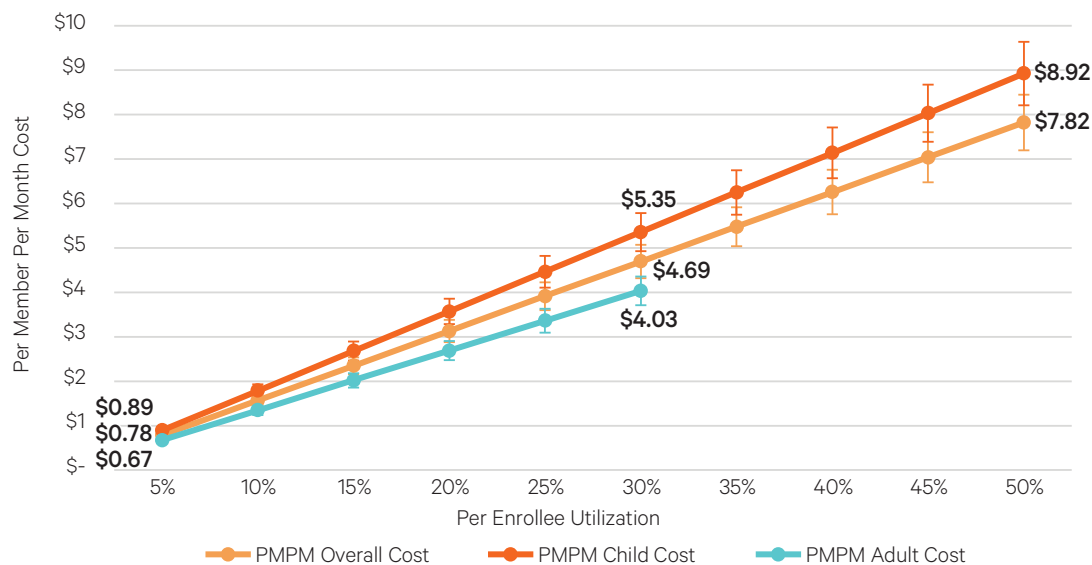


Figure 6. PMPM Cost of Caries Management Encounter Package

PMPM Cost of Periodontal Management Encounter Package

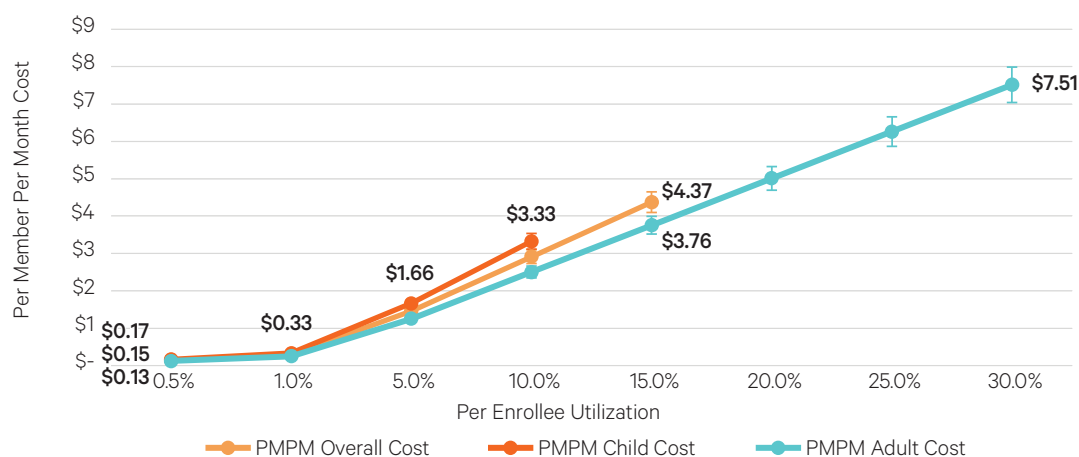


Figure 7. PMPM Cost of Periodontal Management Encounter Package

The **periodontal management encounter package** can be used either separately or in combination with the caries prevention or caries management encounter packets. The package includes an evaluation or screening of a patient, oral hygiene instructions, periodontal maintenance, referral to specialists as needed, and dental case management. Assuming two visits per year with utilization of 1% for adults, the average proportion of adults receiving periodontal treatment within a

national Medicaid sample, PMPM costs would be \$0.33 (Figure 7, see Methodological Appendix for details). If the system expands utilization to 30% to capture a greater proportion of the adults in need (42% of low-income adults are estimated to have untreated periodontal disease), PMPM would increase to \$7.51 among adults.¹³² Each visit would provide dental care teams with a correlated reimbursement of \$150.30 for adults.

Domain Two Advantages to Patients, DHCWs, and Payors

Advantages to Patients

Minimally Invasive Care (MIC) provides patients with more control over their oral health by slowing progressive disease effects and creating more time for healthy behavior change, thereby preventing the need for surgical intervention.¹³³

MIC techniques steer the process away from “replacement dentistry,” wherein the cavity gets larger and the tooth gets weaker through repeated dental interventions with active underlying disease.¹³⁴⁻¹³⁹ Since restorative materials used by dental providers are not complete or adequate replacements for tooth structure, preserving as much of the natural tissues as possible is important for long-term patient health.¹⁴⁰⁻¹⁴¹ Data about MIC indicate that patients reported better oral health and expressed satisfaction with both alternative caries management techniques and the aesthetic appearance following glass ionomer utilizationⁱⁱ. For pediatric patients, parents and caregivers preferred the use of silver diamine fluoride as part of MIC, over behavior modification techniques or sedation procedures.¹⁴²⁻¹⁴⁵ Parents and caregivers are more accepting of minimally invasive procedures given the reductions in pain, fear, and trauma experienced during dental treatment. As a long-term benefit, these patients gradually accept and tolerate more involved dental care.¹⁴⁶⁻¹⁴⁹

Silver Diamine Fluoride



Silver Diamine Fluoride (SDF)¹²⁹⁻¹³¹ can successfully arrest caries in both children and adults. Clinical guidelines suggest one to two applications per year on teeth with carious lesions.

Assuming 15% utilization, the associated additional cost of including SDF in the caries management encounter package is \$.50 PMPM per application, per tooth.

Box 3. Silver Diamine Fluoride

Periodontal Prevention and Management



Periodontal disease^{5,6,132} is directly linked to several systemic conditions, including cardiovascular disease, type 2 diabetes, pneumonia, dementia, and adverse pregnancy outcomes.

Periodontal interventions also have been tied to substantial cost savings for the treatment of system conditions, especially type 2 diabetes. However, fewer than half of state Medicaid plans currently cover periodontal services for adults. Therefore, we do not propose additional bundles related to periodontal care beyond maintenance and management. Given the vital importance of managing periodontal diseases, there is a need to expand benefit structures around periodontal prevention application, per tooth.

Box 4. Periodontal Prevention and Management

ⁱⁱ Associated with the first sign of caries-like lesion on enamel that can be detected with the naked eye as a milky white opacity when located on smooth surfaces.

Advantages to Providers

MIC generates cost savings with improved overhead management^{jj}, expanded service delivery, and decreased patient infection risk.¹⁵⁰⁻¹⁵¹ Common agents incorporated with minimally invasive care include silver diamine fluoride (SDF)^{kk}, glass ionomer^{ll}, and remineralization agents. Several evidence-based techniques are currently available that support minimally invasive care in dentistry:

- Providers can minimize aerosol generation with SDF application simply by drying with cotton instead of using compressed air and not rinsing.
- Providers can place glass ionomer with limited aerosol production because it bonds to demineralized tooth structures, facilitating partial caries excavation using hand instruments as in
 - Atraumatic Restorative Treatment (ART);
 - Interim Therapeutic Restorations (ITR);
 - Silver Modified Atraumatic Restorative Treatment (SMART), or
 - the Hall technique^{mmm}.¹⁵²⁻¹⁵⁴
- Providers can utilize calcium silicate cements like Mineral Trioxide Aggregate (MTA)ⁿⁿ and glass ionomer in the ART/ITR approach.¹⁵⁵
- Providers can place glass ionomer in a non-dry tooth rather than the extremely dry environment required by most composite resins^{oo}, a priority for treatment or preventive sealants.^{pp}

Ideally, team-based care delivery should support these procedures to expand dentist availability to perform more complicated procedures that also carry a greater overhead cost.¹⁵⁶⁻¹⁶³ Practices can maximize workforce efforts to improve the availability of the dentist while aligning roles with the level of license and practice.¹⁶⁴⁻¹⁶⁷

Advantages to Payors

In a recent survey, 100% of Medicaid dental administrators and 70% of employers that purchase dental benefits agreed it was very important to access preventive dentistry for improving overall health.¹⁸ In the same report, the majority of Medicaid dental administrators (68%) stated that more comprehensive prevention strategies are the most important benefit of future dental coverage.

Traditional benefit packages may not standardize the service codes associated with MIC. These packages are not designed to provide reimbursement for the bundled procedures with high financial value (revenue that provides financial sustainability will create lower costs to the system), compared with restorative or surgical procedures. Including these procedures in public and commercial plans helps payors focus on safe and valued treatment options. In turn, payors can support both population health and personalized care^{qq} pathways based on risk, individual needs, and shared decision making.¹⁶⁸⁻¹⁷⁰ Payors should design benefits that allow flexible coverage and service frequency, permitting providers to individualize care, focus on prevention, and maintain cash flow.

^{jj} Refers to the ongoing expense of operating a business.

^{kk} SDF is a topical medication used to treat and prevent dental caries and relieve dentinal hypersensitivity.

^{ll} Glass ionomer cement is a restorative material used as a filling material and luting cement. It has the additional benefit of leaching fluoride to the adjacent tooth structure, which provides some protection against recurrent caries.

^{mmm} The Hall Technique is a noninvasive treatment for decayed baby back (molar) teeth. Decay is sealed under preformed (stainless steel) crowns, avoiding injections and drilling. It is one of many biologically-orientated strategies for managing dental decay.

ⁿⁿ Mineral trioxide aggregate (MTA) is a biocompatible repair material that is often used along with glass ionomer cement.

^{oo} Often referred to as tooth colored filling materials, composite resins are types of synthetic resins that are used in dentistry as restorative material or adhesives.

^{pp} A caveat: you may need to replace the GI sealant more frequently, because they wear more and retention is generally the criteria for replacement or repair given that other metrics are unreliable (unless a large lesion develops).

^{qq} Personalized health care (PHC) is an overarching framework for care that unifies predictive technologies with an engaged patient to coordinate care, with the primary aim of promoting health and preventing disease.

Domain Two SWOT Analysis^{134-141, 171-179}

Support from respected medical and dental organizations, growth of interprofessional practice of primary and secondary care in the oral health sector, and new agents or technology that facilitate the provision of more financially beneficial procedures were identified as process enablers through the SWOT analysis. Lack of consistent reimbursement from third party payers, lack of willingness and preparedness among dentists to incorporate primary and secondary care structures within existing dental business models, and a scarcity of in-the-field piloting and available publications to understand real world implications have been identified as challenges to overcome Domain Two processes to be successful.

Domain Two SWOT Analysis





Domain Three: Personalized and Integrated Intervention

Domain Three Clinical Guidance

The pre-existing health care paradigm shift accelerated by COVID-19 includes consumer habit changes, focus on chronic disease management, politicization of U.S. health care, increased provider burnout and dissatisfaction, and the health care cost crisis. This shift has forced the marketplace to reevaluate and change operational and financial systems along with their management. The role of patients is starting to change as they seek a less drill-and-fill approach by becoming co-designers of health. This evolution is well summarized as moving from “What is the matter with you?” to “What matters to you?”¹⁸⁰ It is supported by detecting and treating disease or injury as soon as possible to halt or slow its progress, encouraging personal strategies to prevent reinjury or recurrence, as well as implementing programs to return people to their original health and function. While personalized care often is linked to prevention, surgical intervention modalities such as 3-D printing and modeling, materials management, advanced imaging, genetics, laser application, and the goal of maintaining the greatest amount of natural tissues will drive surgical dental care into the future. In addition, improved

personalized strategies with an integrated approach should prolong the integrity of restorative materials as well as the longevity of surgical interventions.

This transition will not be an easy process. It could take several years because the disease burden of oral health is greater than in other health care sectors, and this is especially true for Medicaid, Medicare, and the dual-eligible populations.¹⁸¹⁻¹⁸³ Moreover, dental patients were experiencing long waiting lists and backlogs of incomplete treatment plans prior to the COVID-19 pandemic. Many patient conditions will have been exacerbated by the additional delay in treatment between the shutdown period and resumption of surgical dentistry. Even after using teledentistry, MIC, and triaging emergent patients, the additional attention to infection control will limit capacity to provide more invasive procedures. Therefore, scheduling and effective time management for surgical interventions will be paramount for successful operation in Domain Three. Prior to COVID-19, scheduling guidance recommended that general dentist practitioners focusing on commercial insurance or self-pay patients see between 8 and 12 patients per day.

While Domain Three reinforces compliance with infection control best practices, this domain's overarching goal is to implement a more personalized and integrated delivery of dental and oral health care, including the recognition that overall health and oral health are inextricably linked.

Consequently, and often, safety net clinics must see a higher volume to offset lower reimbursement. Safety net clinics aim for 1.7 patients per dentist FTE hour (or 1314 patients per day) and 1.2 patient encounters per dental hygienist FTE hour (or 8–10 patients per day).^{184–185} The pandemic caused dental practices to adjust their operations, and the pre-COVID-19 operational numbers have not been reported.

Some dental practice operational adjustments included expanded clinical hours to offset patient turnover time, extending appointment times to increase the number of procedures that could be completed in one appointment, and using technology and advanced agents to lower overhead costs. Paramount to the implementation of Domain Three is appropriate and progressive use of infection control processes.^{186–198} In today's COVID-19 environment, it is vital for providers to follow and remain updated on professional guidelines, while complying with state and local regulations. For patients to return to the dental office for surgical (and other) procedures, patients need to trust that their dental office is safe. Providers need to assure patients of strict adherence to infection control practices that effectively mitigate the risk

of infection. A recently-created infection control [document](#) for oral health professionals provides a checklist of guidelines for the safe operation of dental practices.

While Domain Three reinforces compliance with infection control best practices, this domain's overarching goal is to implement a more personalized and integrated delivery of dental and oral health care, including the recognition that overall health and oral health are inextricably linked. This interdependency is critical to a primary care model that focuses on both improving oral health and overall health. Tissue health and structural integrity in the mouth can be altered by poor systemic health (and vice versa). Integrated care teams, which include community health workers, should function closely to manage individual care plans, align with the seven shared principles of primary care^{rr}, and implement a personalized health process.¹⁹⁹ Integrated care is best accomplished by implementing patient-centered health care delivery, personalized health planning (PHP), analytics, shared decision-making, and patient engagement to encourage healthy behaviors throughout a lifetime.^{200–204}

Domain Three Advantages to Patients, DHCWs, and Payors

Advantages to Patients

Integrated and personalized approaches to care improve the delivery of oral health. When this wholistic method is applied to health care delivery, patients are more likely to express satisfaction with the encounter.^{18, 205–206} Patients exhibited increased knowledge of their own health contributors when oral health was integrated within a medical care visit. In these visits, patients were especially satisfied with the increased convenience and streamlined care delivery within an integrated oral health visit.²⁰⁷

Despite the necessary shift away from prioritizing surgical intervention as seen in Domains One and Two, not all cavitated lesions are easily self-cleansable or respond well to all MIC agents. Because of this, surgical intervention will remain a necessary component of dental care. Patients will continue to desire a safe environment and will value infection control practices at care facilities that mitigate virus spread when surgical intervention is unavoidable. The advancement of technology in oral health has resulted in more rapid placement of crowns and dentures. In addition, advances in imaging and diagnostics make it easier to find disease earlier, which promotes less natural tissue loss.

^{rr} The seven shared principles of primary care consist of personal and family centered, continuous, comprehensive and equitable, team-based and collaborative, coordinated and integrated, accessible, and high value.

Advantages to DHCWs

Care teams have increased adoption of integrated and personalized oral health, albeit in small cohorts, either through participation in a value-based dental benefit plan or by initiating membership/subscriber plans as a small business. Providers and care teams report higher satisfaction when personalized planning is implemented.²⁰⁹⁻²¹² Recent data support providers are responsive to an integrated process, desire better screening and referral processes by interprofessional practices, and favor improved communication.²⁰⁹ Moreover, evidence suggests care providers have effectively leveraged improved quality of care with increased financial bonuses.²¹⁰ Similarly, financial stability is observed with operations and care team salaries, especially when providers are affiliated with a group network or dental service organizations operating within an integrated and value-over-volume financial structure.²¹⁰⁻²¹²

Domain Three offers an approach that mitigates infection risk to surgical providers. Embedded in this domain is a long-term safety framework to address other pathogens beyond the SARS-CoV-2 virus. Inhalation of surgically produced airborne particles and aerosols may cause adverse respiratory health effects and bidirectional disease transmission in patients and dental providers.²¹³⁻²¹⁹ In 2019, West Virginia University and the National Institute for Occupational Safety and Health announced a partnership to study how potentially harmful “microscopic, airborne particulate and gases are generated during dental procedures.”²²⁰ Dental aerosols can include oral microflora, which data have shown are linked to many respiratory issues including sinusitis, rhinorrhea, and headaches.²²¹⁻²²⁷ Studies have identified clusters of dental personnel treated for idiopathic pulmonary fibrosis.^{ss, 228-232} Given that surgical intervention will remain a necessary component of patient dental care regardless of COVID-19, dental practices should consider ensuring infection control practices supporting Domain Three.

Advantages to Payors

Personalized care plans effectively decrease the number of ED visits, reduce health care expenditures, and are well-received by network providers.²³³ In addition, medical-dental integration can produce significant cost savings to the overall health system by addressing undiagnosed systemic disease and guiding chronic disease management. In fact, the CDC has recently reported yearly savings could reach as high as \$100M if screenings for diabetes, high blood pressure, and high

Medical-dental integration can produce significant cost savings to the overall health system by addressing undiagnosed systemic disease and guiding chronic disease management.

cholesterol occurred during dental care visits.²³⁴ When oral health is a component of well-child visits, earlier intervention with disease processes and promotion of healthy behaviors lead to better health outcomes.²³⁵ As an acceleration in the convergence of medical and dental benefit designs occurs, cost savings as a result of oral health integration will increase the value of these programs during the current paradigm shift.

Third party dental benefit payors must provide a safe and effective network of DHCWs to clients and members. Reducing surgical interventions by prioritizing prevention and MIC described in Domains One and Two will result in less costly care, both in the immediate and long term future. A healthier mouth and body, as well as preservation of tooth and gum tissue, can also lead to longer lasting restorations and improved surgical outcomes. Benefit organizations significantly shape ongoing credentialing efforts while overseeing waste, fraud, and abuse to achieve quality care goals. Enrollees participating in oral health plans desire a safe dental encounter during the pandemic and beyond. Provider attention to infection control and a reduction in aerosol exposure is paramount in today's environment.²³⁸⁻²⁴¹ In addition, the advancement of digital dentistry^{tt} can help achieve goals related to the Quadruple Aim with better outcomes, shorter appointment processes, and better opportunities for education and knowledge development.

^{ss} A form of chronic, progressive fibrosing interstitial pneumonia of unknown cause is characterized by unexplained labored breathing and a nonproductive cough.

^{tt} Digital dentistry may be defined in a broad scope as any dental technology or device that incorporates digital or computer-controlled components in contrast to that of mechanical or electrical alone.

Domain Three SWOT Analysis^{213, 242-253}

The SWOT analysis for Domain Three concluded that limited operationalization of social determinants of health, a lack of interoperability related to electronic health records, and limited access with increased cost of personal protective equipment (PPE) will strain change management and capital for investment. Slow workforce advancement and limited staffing due to COVID-19 staff furloughs impact operations and workflow. Lastly, inconsistencies in patient willingness to co-design and participate in oral as well as overall individual health hinder progress. Programs and frameworks that are readily available for interprofessional practice and medical-dental integration, increased use of and patient desire for data-driven insights for health decision-making, and advances in algorithm-based software to improve scheduling and operational management are positioned to effectively advance an integrated and personalized oral health approach.

Domain Three SWOT Analysis



The Recovery Benefits of the Domain Framework

We present projections of Medicaid spending through the end of 2022 in Tables 7 and 8 and Figures 8 and 9. We based these projections on various scenarios and compared them to the Centers for Medicare & Medicaid Services (CMS) pre-COVID-19 projections of dental spending for the same time period.²⁵⁴

We focus on Medicaid dental spending in this section since the effects of the domain framework impact this population considerably; however, the effects of the domains approach may hold in true within other markets beyond Medicaid.²⁵⁵

Importantly, these projections depend on several assumptions, which are outlined in the Methodological Appendix, and can vary greatly depending on a variety of factors: the progression of the COVID-19 pandemic, consumer habits, changes in Medicaid enrollments, state Medicaid budgets, and federal support for Medicaid and dental spending. Thus, the reader should interpret these projections with caution.

Table 7 and Figure 8 assume a continual recovery, with no additional need to close dental practices to in-person dental visits due to future waves of COVID-19. In Scenario A, we project a slow recovery that matches 80% of projections by May 2021, and 95% of projections by 2022.²⁵⁵⁻²⁵⁶ Scenario A assumes no other changes in Medicaid enrollment or benefits, which is unrealistic but serves an important baseline with

which to layer complexity. Scenario B assumes that Medicaid enrollment will increase as unemployment increases; however, that spending will ultimately decrease if state legislatures cut optional benefits and reimbursement rates, particularly for adults, pregnant women, and those with special health care needs (Figure 8).²⁵⁷⁻²⁵⁸ Scenario C assumes that states begin to implement the Domains in the first quarter of 2021, with the expanded use of the packages resulting in increased utilization at a lower PMPM cost (Figure 8).

Table 8 and Figure 9 assume a second wave of COVID-19 that requires partial closure of dental practices for in-person dental care in many states toward the end of 2020 and into the beginning of 2021. Although it is impossible to accurately predict the future, our modeling assumes a decrease in dental spending to 30% of projections in January 2021, associated with new restrictions and a slower return to previous norms of dental care delivery, and 80% of projections by May 2022 as more practices close permanently. The packages incorporated within the three domains allow continued operation in the COVID-19 environment. Widespread adoption of the domain framework would allow practices to maintain their operations and hopefully increase utilization of care for those at greatest risk for oral diseases, even in the face of a resurgence and future pandemic (Figure 9).

Table 7. Total Projected Medicaid/CHIP Dental Expenditures in Billions

	Q4 2020	2021	2022
CMS Projection (pre-COVID-19)	\$3.47	\$15.30	\$16.20
Scenario A: Medicaid dental spending recovers to 80% by May 2021, and 95% by May 2022	\$2.63	\$12.64	\$15.20
Scenario B: Scenario A, but affected by increase in enrollment and reductions in benefit coverage	\$2.50	\$11.50	\$13.62
Scenario C: Scenario B, but with widespread adoption of domains	\$2.50	\$12.76	\$15.67

Table 8. Total Projected Medicaid Dental Expenditures in Billions, Assuming Second COVID-19 Wave

	Q4 2020	2021	2022
CMS Projection (pre-COVID-19)	\$3.47	\$15.30	\$16.20
Scenario A: Medicaid dental spending recovers to 80% by May 2022	\$1.62	\$10.21	\$12.85
Scenario B: Scenario A, but affected by increase in enrollment and reductions in benefit coverage	\$1.55	\$9.29	\$11.52
Scenario C: Scenario B, but with widespread adoption of domains	\$1.55	\$12.24	\$15.67

Total Projected Medicaid Dental Expenditure in Billions

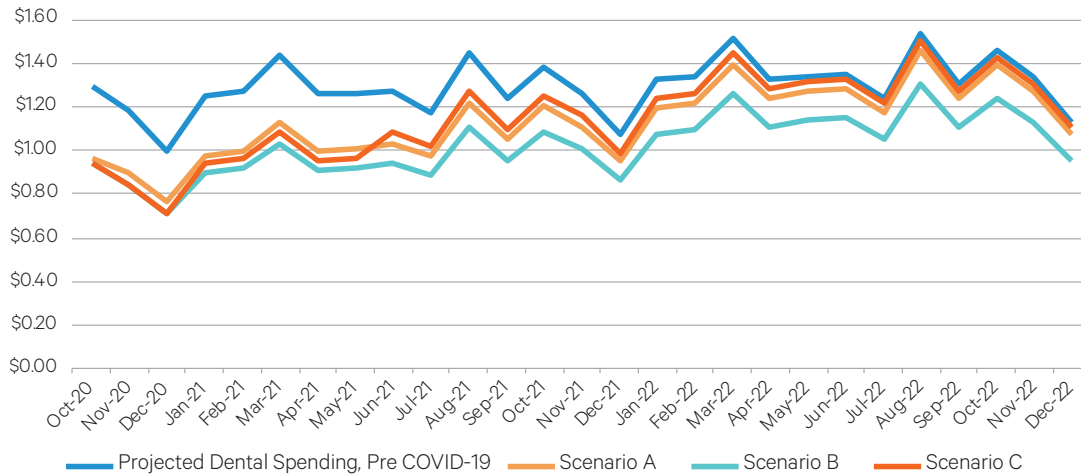


Figure 8. Total Projected Medicaid Dental Expenditure in Billions

Total Projected Medicaid Dental Expenditure in Billions

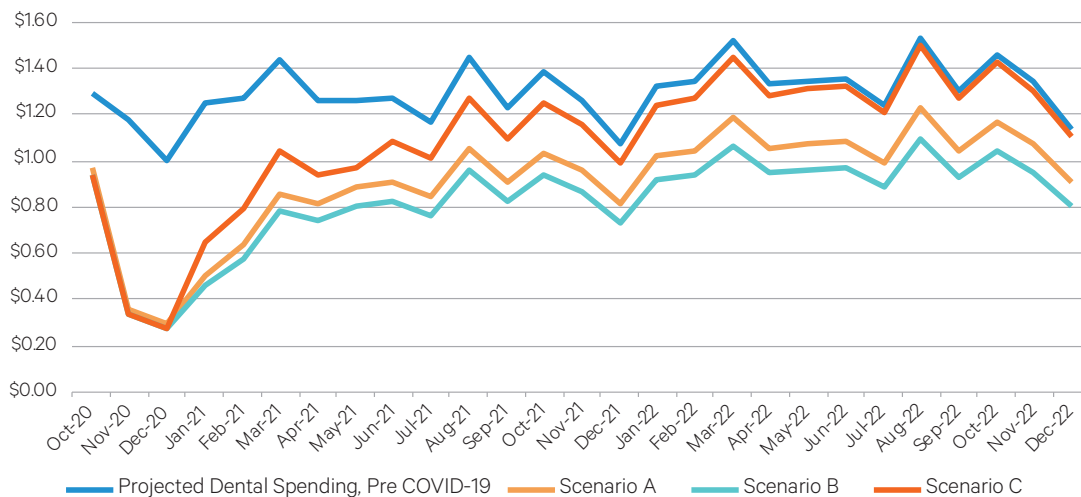


Figure 9. Total Projected Medicaid Dental Expenditure in Billions

Next Steps for Implementation

The CareQuest Institute for Oral Health is taking significant steps to support providers, patients, payors, and other key stakeholders to transition care delivery using the domain framework for oral health. The planned activities below will occur in the coming years, with data collection and analysis informing a stepwise implementation of this approach.

Short-Term:

- Introduce financial strategies and associated billing structures to remain flexible and responsive during the changing dental landscape.
- Establish interprofessional care team designs to support oral health case management and care-coordination efforts.
- Redefine Relative Value Units (RVUs) to ensure financial stability of care teams and maintain a high value by consumers for oral health care.
- Provide education, training, and clinical technical assistance on medical or minimally invasive care and teledentistry to support clinical care associated with Domains One and Two.
- Implement pilot programs throughout a variety of care sites and networks with rigorous data collection to inform guidance on best practice approaches.
- Create and disseminate comprehensive technical assistance documentation addressing questions and concerns about implementing these domains of care, based on community feedback.
- Propose guidance and infrastructure as well as products and technology for implementing wholistic, value-based systems of care that involve dental, oral health, and other health providers working interprofessionally to promote optimal health outcomes.
- Recommend health information technology solutions that cohesively integrate medical and dental electronic health records while improving care coordination.
- Identify state and federal regulatory barriers to the delivery of personalized and integrated services and develop intervention strategies.

Medium- and Long-Term:

- Stimulate federal, state, and private sectors to invest and lead the transformation into value-based care delivery within the domain framework.
- Provide educational guidance and instruction for schools of dentistry and dental hygiene to teach the domain framework of oral health care to future dental care teams while adopting new business models for clinical care used in education.
- Create recommendations under each domain of care for working with special populations (e.g. individuals with disabilities, older adults, rural communities, etc.).
- Develop educational platforms to train care teams and payors on the financial and billing components associated with the domain methodology.
- Create observable outcome measures and an evaluation process associated with each domain of dental care.
- Provide guidance on advancing partnerships to address community support needs and social determinants of health.



Conclusion

COVID-19 has exacerbated persistent socioeconomic disparities in health outcomes and social risk factors at a time when health agencies are anticipating less revenue and increasing pressure on social services. This new environment challenges health professionals and stakeholders to reconsider oral health care design and business operations to drive meaningful change toward improving the oral health of all. When most shelter-in-place orders were given, dentistry was separated from health care overall with different regulations, policy changes, definitions of emergency as well as routine care, and varied communication on risks and benefits. This separation reinforced the message that oral health has less value than physical health. The ramifications of undervaluing oral health undermine overall health, economics, gainful employment, mental health, school and work performance, and socialization.²⁵⁹⁻²⁶²

In order to reinforce the value of oral health care and its integral influence on overall health, we propose three domains of oral health investments and care advancements for financial

viability and improved population health. The interventions within this domain framework can advance patient and provider well-being, while reducing the cost burdens associated with poor quality of life due to oral disease. Domains One and Two form a primary and secondary care structure in dental operations to prevent and mitigate disease advancement. This provides a streamlined approach to the integrated and personalized care model of Domain Three. The development of primary and secondary care structures within dental operations is a divergence from the “drill and fill” process. The domain approach creates a process similar to that of primary care for dental care delivery, which supplies additional guidance for implementing secondary (MIC) and tertiary (surgical) care. As seen with our medical counterparts, this system empowers patients to invest in their health. The domains reinforce connections between social and structural determinants of health, while promoting new opportunities to demonstrate value-based solutions that connect care providers, communities, and individuals.

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Methodological Appendix

Benefit Design Considerations

There are four primary components used to estimate a per-member, per-month fee for each of the various code packages under consideration; different assumptions and resources were employed to estimate each component.

1. Per Visit Cost

- a. The per-visit cost was generally calculated by looking at the 40th percentile of the 2020 NDAS fees (<https://wasser-man-medical.com/shop/product/national-dental-advisory-service-2020-fee-report-book/>) for all the code variations listed in the package.
- b. Because Medicaid reimbursement rates are lower than commercial reimbursement rates, we further reduced the fees by using the average reimbursement in Medicaid, for both children (age 20 and under) and adults (age 21 and older), as a proportion of commercial fees from available reports (https://www.ada.org/-/media/ADA/Science%20and%20Research/HPI/Files/HPIBrief_0417_1.pdf). If there are wide variations in fees in each portion of the package (i.e., 40th percentile fees for teledentistry can range from \$29 to \$119, depending on the type of visit), we took the average fee in each category. However, we also produced a range of high and low estimates using the highest and lowest fees for each portion of the package (Domain 1) or by taking the 40th and 60th NDAS fee schedule for each package (Domain 2).
- c. For overall population fee estimates, fees were then weighted based on the relevant portion of the child vs. adult population that uses those broad type of benefits, based on calculations from the 2017 IBM Watson Medicaid MarketScan data. For example, 76% of all the diagnostics and preventive visits are made by children, whereas 24% are made by adults.

2. Number of visits each member that utilizes the service will have per year

- a. These were generally based on current reimbursement practices, clinical guidelines, or analysis of existing Medicaid data.
 - i. Estimates for the oral health package and the periodontal management package assumed two visits per year, while the caries prevention and management package assumed one visit per year.
 - ii. The emergency telehealth package used an estimate of 1.15 visits per year, which came from an analysis of the average number of emergency dental visits among those who used emergency dental services in the 2017 IBM Watson Medicaid MarketScan Data.

3. Utilization of Services

- a. Estimates of the utilization of each package were derived from analysis of existing Medicaid data, estimates of the burden of disease, and the estimated impact of the packages. Because utilization varies for children and adults, utilization was calculated separately for those two groups.
- b. Estimates of the utilization of the emergency telehealth visit were derived from the proportion of the enrolled population that had an emergency dental visit in 2017, using the IBM Watson Medicaid MarketScan data (2.6% among children, 3% among adults, 2.9% overall).
- c. Estimates of the oral health package and asynchronous oral health package were derived from the utilization of diagnostic and preventive dental services in the 2017 IBM Watson Medicaid MarketScan data (43% for children, 14% for adults, 29% overall).
- d. Estimates of utilization of caries and periodontal packages were derived from the proportion receiving treatment of these diseases in the 2017 Medicaid MarketScan Data (periodontal disease is .2% for children and 1% for adults, caries is 15% for children and 8% for adults) and the incidence of the diseases in the population (untreated dental decay rate is 23% of children and 50% of adults, <https://www.cdc.gov/nchs/data/hus/2018/028.pdf>; 42% adults have periodontal disease <https://jada.ada.org/article/S0002-8177%2818%2930276-9/fulltext>).

4. Number of Medicaid Members

- a. The total population enrolled in Medicaid was derived from Jan. 2020 reports of the Medicaid/CHIP population of the United States (<https://www.medicaid.gov/medicaid-program-information/medicaid-and-chip-enrollment-data/report-highlights/index.html>).

5. Limitations to Benefit Design Considerations

- a. The benefit designs captured herein did not capture all sources of variation in terms of population demographics, including race/ethnicity, special needs population, socio-economic status or social determinants of health, practice location, or state policy environments. It is anticipated these benefit designs will need to be adjusted for the specific environments in which they are implemented based on these and other considerations.

Projections

Projections of Medicaid dental spending from Oct. 2020 through Dec. 2022 were created using data from a variety of sources and include several sets of assumptions.

1. Pre-COVID-19 estimates of dental spending are from CMS estimates of National Health Expenditures (<https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsProjected>). Estimates of monthly cost variations come from the 2016/2017 IBM Watson Medicaid MarketScan Database.
2. Estimates of COVID-19 Medicaid spending are built on assumptions found in the ADA Health Policy Institute modeling of the impact of COVID-19 on U.S. dental spending (https://www.ada.org/~media/ADA/Science%20and%20Research/HPI/Files/HPIbrief_0420_1.pdf?la=en) along with insights generated from the DentaQuest Partnership's survey of Medicaid providers (https://www.dentaquestpartnership.org/system/files/DQP_DentalCare%27sNewNormal_CommunicationsBrief_v2_6.3.20.pdf). The modeling assumes 80% recovery of dental spending by May 2021 and 95% recovery by May 2022.
3. Estimates of the increase in Medicaid spending associated with increased unemployment were derived from evidence that each 1% increase in unemployment is associated with a .635% increase in Medicaid enrollment (<https://www.healthaffairs.org/doi/10.1377/hlthaff.2016.1076>). Projections of the unemployment rate came from the Congressional Budget Office (<https://www.cbo.gov/publication/56335>).
4. Estimates of reductions decrease in Medicaid spending associated with adult dental benefit cuts assumed that roughly half the states will cut adult dental benefits, which is consistent with evidence from the last recession, in which one-quarter of states cut adult dental benefits. It is also consistent with evidence from the Medical Expenditure Panel Survey, which found that spending on Medicaid dental services is driven more by policy changes than by recessionary periods.
5. Estimates of the impact integrating the three domains into Medicaid policy assumed that implementation will be slow initially but will gradually grow. Because the packages allow staff to become more efficient, they will allow for increasing utilization at lower PMPM costs. These may allow states to maintain benefits for adults as well.

6. Similar to many schools and business (<https://www.nytimes.com/2020/05/19/us/coronavirus-college-fall-semester.html>), dentistry may need to be prepared for a resurgence of COVID-19 in the winter of 2020/21 that may result in new closures. Although it is impossible to determine exactly what will happen, our modeling assumed a decrease in dental spending associated with new restrictions, and a slower return to normal as more practices close permanently. Because the packages in the three domains are designed to allow continued operation in COVID-19 environment, widespread adoption would allow practices to maintain their practice, even in the face of a resurgence and future pandemic occurrences.

APPENDIX B – The Importance of Risk Stratification

A methodology employed in oral health disease management is risk stratified assessment and treatment. The American Academy of Family Physicians calls Risk Stratified Care Management (RSCM) the process of assigning a health risk status to a patient and using the patient's risk status to direct and improve care. The goal of RSCM is to help patients achieve the best health and quality of life possible by preventing chronic disease, stabilizing current chronic conditions, and preventing acceleration to higher-risk categories and higher associated costs.¹ A recent review article explained that “in dentistry, risk assessment is most commonly used to evaluate caries or periodontal disease activity and serve as a foundation for care goals and patient communication. The risk assessment aids care teams in understanding the probability of oral disease development, and prospects for changes in the disease process due to protective, behavioral, and/or clinical interventions.”² Currently, risk stratification occurs more often in practice for caries diseases than for periodontal diseases. This is most likely due to the development of reimbursement structures in fee-for-service contracts as well as an increased need for population health in alternative payment model structures.³⁻⁵ Risk assessment activities provide a structure that coaches and stimulates individuals toward achieving oral health. Given the importance of risk stratified care, we provide an evaluation of caries risk assessment utilization in dentistry.

In an analysis of a community-based oral health program operating in a value-based contract by the DQP for this report, claims analysis demonstrated less need for emergency care and surgical intervention as well as improved preventive participation for those individuals who received an oral health assessment and anticipatory guidance with caries risk stratification in a community setting⁶⁰ (Figures s1B and 2B). It was also found that the individuals who received a community-based assessment incurred costs that were \$253 less annually than those without an assessment visit. This program demonstrated success utilizing lower cost, dental hygienist-led

⁶⁰ **Community setting** means a location outside a hospital inpatient, acute care setting or a “brick-and-mortar” dental care site usually designed to improve convenience and access. A community setting may include, but is not limited to, a home, group home, assisted living or long-term care, facility, correctional facility, hospice, or school-based care.

teams, which provided an opportunity for dentists to increase chair time for operative dentistry. It should be noted that the structure of these processes could also be adapted into a teledentistry model that could positively have a positive impact on practice overhead and offer additional revenue sources for care team operations.

Relationship between a visit with caries risk assessment procedures in 2018 on Oral Health in 2019

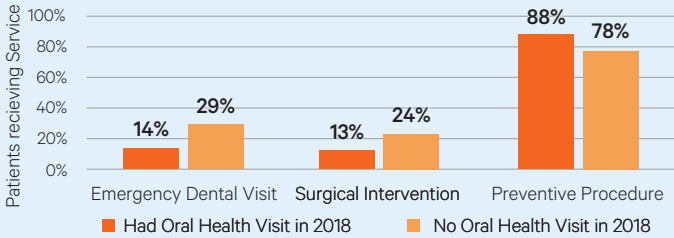


Figure 1B. Relationship between a visit with caries risk assessment procedures in 2018 on Oral Health in 2019

Average Annual Cost of Dental Care in 2019

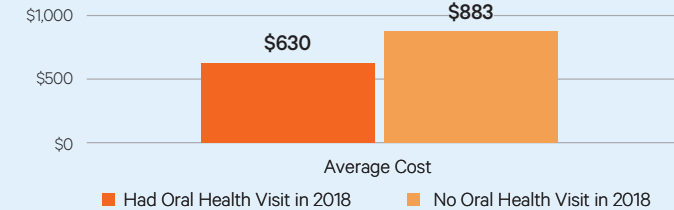


Figure 2B. Average Annual Cost of Dental Care in 2019

Currently, there is no consensus on which caries risk assessment tool or process is best, and frameworks for easy adoption are limited. Many care teams and organizations have developed their own methodology to best risk stratify their patient populations, with some organizations using analytics to adapt into a more user-friendly care flow process. In addition, there are some differences between the risk assessment processes used for other chronic conditions in which “rising risk” is a category alongside low and high-risk selections. In dentistry, most risk assessment tools include a “moderate risk” category instead of “rising risk,” which can be difficult to pinpoint and track in current dental practice.

Risk stratification improves surgical processes and outcomes.⁵⁻⁹ The discovery of disease burdens can steer patients toward better health, while risk stratification can lead to lower cost and increased revenue for dental practices. In a DQP analysis of risk-stratified cost of an interprofessional program, it was observed that individuals with higher caries risk were more likely to cost more and need more extensive dental surgical intervention (Figure 3B).¹⁰

PMPM modeling of risk-stratified care utilizing this scenario is presented in Figure 4B. This figure assumes risk stratification follows the distribution shown in Table 1B; oral health telehealth package costs; and in-office visits for an evaluation, prophylaxis, and oral hygiene instructions; and (for children) a fluoride varnish application

Risk Stratified Annual Surgical Dental Intervention Costs

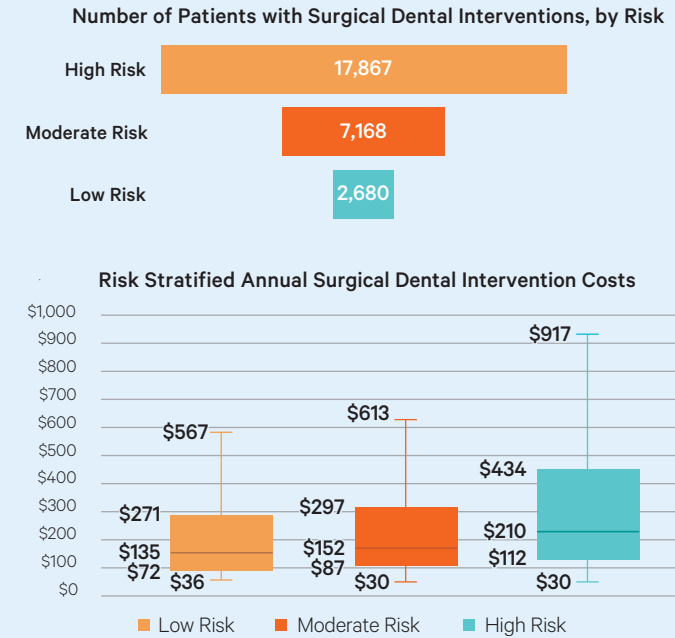


Figure 3B. Risk Stratified Annual Surgical Dental Intervention Costs

Average PMPM of Risk Stratified Oral Health Telehealth Package and In-Office Diagnostic and Preventive Care

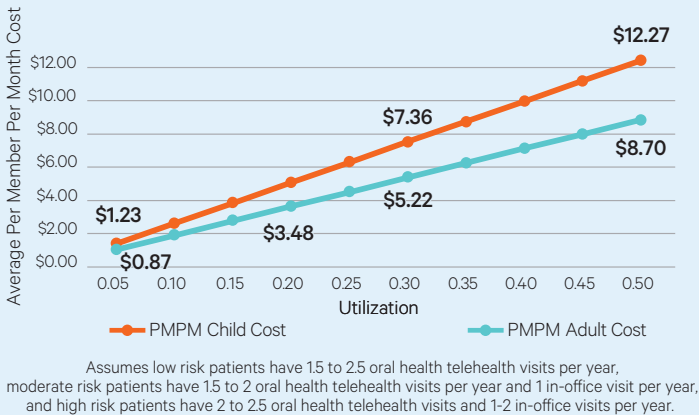


Figure 4B. Average PMPM of Risk Stratified Oral Health Telehealth Package and In-Office Diagnostic and Preventive Care

Table 1B. Distribution of Caries Risk among Medicaid Enrolled Children and Adults

	Child	Adult
Low	25%	12%
Moderate	14%	20%
High	61%	67%

Sources: Children's risk stratification; Halasa-Rappel YA, Ng MW, Gaumer G, Banks DA. How useful are current caries risk assessment tools in informing the oral health care decision-making process?. J Am Dent Assoc. 2019;150(2):91-102.e2. doi:10.1016/j.adaj.2018.11.011. Adult risk stratification; DQP Analysis of Advantage Dental Data

at average Medicaid reimbursement rates.¹¹ These PMPM rates cost less than the existing PMPM that most Medicaid plans pay (\$13.45 for children with 43% average utilization, and \$7.44 for adults at 14% utilization) even at higher levels of utilization. The use of an oral health telehealth package for risk-stratified care is significantly less expensive than utilizing in-office visits exclusively to provide this care (Figure 5B).

Average PMPM for Risk Stratified Care for Children

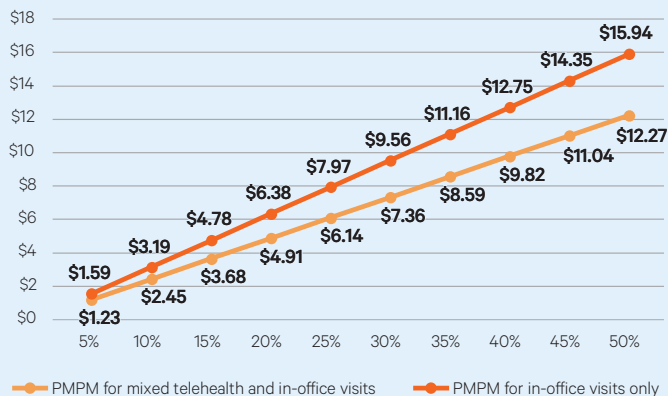


Figure 5B. Average PMPM for Risk Stratified Care for Children

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