CareQuest Institute for Oral Health®

WHITE PAPER

From Silos to Synergy

Integrating Oral Health into Whole-Person Care Through Interprofessional Practice

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WHITE PAPER

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Tables and Figures

Executive Summary

This white paper, with accompanying use cases, explores the integration of oral health into health care through interprofessional practice (IPP).

Key Takeaways

- Oral health is health, as emphasized by the National Institute of Dental and Craniofacial Research. Achieving optimal health and quality of life requires the full integration of oral health into health care systems, which hinges on robust interprofessional collaboration.
- According to the World Health Organization (WHO), IPP refers to clinical care in which "multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers, and communities to deliver the highest quality of care across settings."
- Since the mid-20th century, oral health's role in IPP has been transforming from a fragmented, isolated discipline into a fully integrated, team-based approach that aligns oral health with the broader health care ecosystem.
- Oral health and systemic health are deeply interconnected across the lifespan. Conditions like periodontal disease are linked to adverse pregnancy outcomes, diabetes, cardiovascular disease, mental health disorders, and dementia, making IPP indispensable for delivering truly comprehensive care at every stage of life.

Achieving optimal health and quality of life requires the full integration of oral health into health care systems, which hinges on robust interprofessional collaboration.

- IPP is a catalyst for transforming oral health care from a siloed service into a collaborative, integrated model that enhances patient outcomes, strengthens chronic disease management, and advances public health.
- Individuals from underserved populations, including individuals with intellectual and developmental disabilities and those undergoing mental health or substance use treatment, benefit significantly from mobile and community-based IPP models. For patients with disabilities and those with dental anxiety, collaborative desensitization strategies between behavioral and oral health providers can dramatically improve access to care and patient comfort.
- Sustaining effective IPP models requires alignment across system, organizational, and individual levels. Rigorous program evaluation, interprofessional education, supportive policies, and payment reform are essential to building and maintaining successful, scalable models.
- IPP thrives in diverse care environments such as integrated care clinics, school-based health centers, long-term care facilities, and mobile clinics — settings that prioritize accessibility and person-centered care for underserved populations.

Sustaining effective IPP models requires alignment across system, organizational, and individual levels. Rigorous program evaluation, interprofessional education, supportive policies, and payment reform are essential to building and maintaining successful, scalable models.

- Fragmented financing structures, especially the separation of dental and medical insurance, pose major obstacles to IPP. Yet, innovative models such as Medicaid pay-for-quality programs, accountable care organizations (ACOs), and targeted grants are demonstrating that integrated care can yield improved outcomes and greater cost-efficiency.
- Systemic, organizational, and clinical barriers continue to hinder oral health integration into broader care models, including incompatible billing systems, non-integrated electronic health records (EHRs), and limited interprofessional training. However, enabling factors such as policy leadership, shared EHRs, and colocated, aligned workflows are paving the way for more seamless collaboration.
- The future of interprofessional oral health care lies in expanding integration beyond primary care, incorporating professions such as nursing, pharmacy, and behavioral health, and leveraging interoperable EHRs to enhance care coordination and track outcomes. Success will depend on policy coherence, sustainable payment models, stakeholder engagement, and a cultural shift toward collaborative, whole-person care.

Conclusion

Oral health is integral to overall health. IPP presents a valuable opportunity to integrate oral health into broader health care systems through collaborative, team-based care. Given the oral-systemic health connection, service integration is essential for delivering comprehensive, life-course care. A particular strength of IPP is the diversity of settings in which care can be provided, including schools, long-term care facilities, and community-based clinics. However, challenges such as siloed systems and financial barriers do exist. To promote whole-person, collaborative care, sustainable models supported by policy, education, and technology are essential. This white paper explores the integration of oral health in IPP with other health professions, emphasizing the importance of this integration across the lifespan. It highlights the evolution of IPP, benefits for diverse populations, challenges such as siloed systems and financing barriers, and the need for sustainable models supported by policy, education, and technology. Future directions call for expanded research, stakeholder engagement, and innovative care models to promote whole-person, collaborative care.

Introduction

Oral health is health, as emphasized by the National Institute of Dental and Craniofacial Research.[1] To fully integrate oral health into health care, health care providers collaborating through interprofessional practice (IPP) is key. IPP in health care — also referred to as interprofessional collaboration — refers to clinical care in which "multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers, and communities to deliver the highest quality of care across settings."[2] The concept of health care professionals working together to deliver high-quality, comprehensive care is also sometimes called "collaborative care" or "interprofessional collaborative care," each of which can be thought of as a type of IPP that involves "intentionally created work groups that have a collective identity and shared responsibility for a patient or group of patients" — for example, a primary care or palliative care team.[3] The term "interprofessional practice" — or IPP — will be used throughout this paper to describe both IPP and interprofessional collaborative care.

The World Health Organization (WHO) presents an early linear model wherein the present and future health workforce is trained to engage in IPP through interprofessional education (IPE), resulting in a collaborative practice–ready health workforce (Figure 1).[2]

Figure 1. World Health Organization Model of Interprofessional Education and Practice[2]

IPE is defined by the WHO as a pedagogical approach that enables students of health professions to "learn about, from, and with each other," thereby equipping them to deliver integrated and collaborative care.[2] This workforce, in turn, is optimally situated to provide optimal health services. Readers interested in learning more about IPE, particularly related to oral health education, are recommended to review a 2025 IPE white paper with accompanying use cases published by CareQuest Institute for Oral Health.[4, 5]

Oral health is inextricably linked to overall health. As will be discussed throughout this paper, poor oral health is associated with several systemic health conditions, most notably diabetes mellitus[6–8] and cardiovascular disease.[9, 10] These oral-systemic connections and others require oral health professionals to work closely with primary care physicians (PCPs) and other medical specialists to help patients maintain optimal oral and overall health. Furthermore, poor oral health is linked to mental health conditions such as major depressive disorder[11, 12] and eating disorders,[13, 14] requiring oral health providers to work closely with behavioral health professionals to ensure that their patients' oral and mental health are managed effectively.

This connection between oral health and systemic health is not restricted to any single phase of life. It begins in the prenatal period, with the links between periodontal disease in birthing parents[15, 16] and premature birth of and low birth weight in their infants.[17–19] It extends to an increased risk of dementia in older adults with periodontal disease.[20, 21] As a result, it is critically important for oral health providers to collaborate closely with their medical and behavioral colleagues to provide optimal, comprehensive care to patients through all life stages. This paper will examine the need for, and models of, IPP, using a life-course perspective.[22]

A particular strength of IPP is the diversity of settings in which care can be provided. At integrated care clinics, including *federally qualified health centers* (FQHCs), PCPs and other non-dental health professionals can provide oral health screenings, fluoride varnish, and referrals to a dental provider.[23, 24] Integrated *school-based health centers* can provide preventive dental care (e.g., oral health screenings and referrals, application of fluoride varnish and sealants) as well as primary care services, behavioral health services, nutrition counseling, reproductive health services, and referrals, among other services.[25] Oral health professionals may provide care at *long-term care facilities* to work alongside facility staff to deliver care to older adults and/or adults with disabilities.[26]

Mobile integrated care clinics deliver comprehensive care, including oral health care, primary care, vaccinations, and other screenings[27] to individuals in rural and other underserved communities using mobile health equipment (e.g., vehicles).

The purposes of this white paper are to define IPP as it relates to the oral-systemic connection and the integration of oral health with other health care professions in providing whole-person, comprehensive care; describe the role of IPP in providing such care across the lifespan; describe different possible practice settings for IPP; discuss the importance of sustainable IPP models and various financial models to support such practices; review some common barriers to and facilitators of implementing IPP programs; and discuss potential future directions for oral health–related IPP programs. This white paper is also accompanied by use cases from 11 organizations across the US that serve as examples of oral health–related IPP programs and activities that are currently ongoing. The hope is that this paper and the accompanying use cases will serve as resources, highlighting the importance of incorporating oral health into IPP efforts and providing both current examples of such efforts and a foundation upon which future IPP initiatives may be built.

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Background

Evolution of IPP in Oral Health

IPP in health care, including oral health, has evolved as part of a broader movement toward team-based care. This shift recognizes the importance of collaboration across health care disciplines to improve patient health outcomes. Over time, the concept of IPP in oral health has grown from early professional isolation into a model that encourages collaboration among dentists, dental hygienists, dental therapists, nurses, physicians, social workers, and other health care professionals. Below is a description of how IPP in oral health has evolved over time:

Early 20th Century: Historically, dental care was siloed from other health disciplines. Dental professionals primarily worked independently, with limited interaction with other health care professionals. This isolated model began to show limitations, especially as awareness grew about the impact of oral health on overall health. Despite evidence suggesting improved patient outcomes and reduced health care costs when dentists are integrated into primary care teams,[28] dentists were often not considered part of the health care team by primary care providers (PCPs) and staff. This perception of separation was largely due to structural barriers such as separated medical and dental insurance, non-interoperable electronic health records (EHRs), and the lack of interprofessional training.

Interestingly, practices with more integrated diabetes care management were more likely to view dentists as part of the health care team,[29] suggesting that integrated care models can positively influence collaboration.

Mid-20th Century: The shift toward more integrated care began to take shape. Various health organizations started recognizing the links between oral health and general health. The American Dental Association (ADA) and other dental organizations began promoting the idea that oral health is critical to overall health, thus encouraging collaboration with other medical fields.[30]

1970s–1990s: Interprofessional education (IPE) started gaining traction in health care education, including dentistry. IPP in oral health aimed to enhance patient care by fostering collaboration and ensuring oral health was no longer treated as a separate entity. During this period, dental professional education programs began incorporating IPE into their curricula to promote teamwork between dentistry and other health care disciplines. This shift was part of a broader health care reform, recognizing that comprehensive care requires input from multiple professions to address the full spectrum of patient needs.[31]

Early 2000s: The WHO began formally recognizing the importance of IPE and collaborative practice. The WHO's support for IPP in health care, including oral health, reinforced the idea that diverse health professionals should work together to address the full range of patient needs. As part of this shift, dental professionals began collaborating more with physicians and other health care providers in managing systemic diseases, particularly those that have oral manifestations, such as diabetes, cardiovascular diseases, and pregnancy-related complications.[2] Furthermore, the growing recognition of oral-systemic health connections prompted greater collaboration.[32]

Present Day: Today, IPP is an integral component of oral health education and practice. Dental schools around the world now emphasize interprofessional learning, where students from different health disciplines are trained together, and there is a greater focus on collaboration within dental clinics and public health programs. Moreover, the growing recognition of oral-systemic health connections, such as the relationship between periodontal disease and cardiovascular disease, has driven the importance of interprofessional collaboration.[33] As a result, dentists collaborate with medical professionals to manage patients' holistic health needs, reflecting a broader, more integrated health care approach.[34]

The Oral-Systemic Connection

The importance of IPP is rooted in the connection between oral and systemic health. Oral health and overall health are inextricably linked,[22, 35] and IPP between health professions is necessary to be able to provide comprehensive, whole-person care, which takes this connection between overall and oral health into consideration. As will be described in more detail in this white paper, these links extend throughout the entire lifespan, necessitating interprofessional collaboration for all patients at all ages.[22]

Links between oral health and overall health begin during pregnancy. Poor oral health of the parent can be linked to adverse birth outcomes such as preeclampsia (i.e., hypertension during pregnancy),[15, 16] preterm birth,[17, 19] and low birth weight.[18] Preterm birth and low birth weight specifically can affect a child's development throughout their entire life, including cognitive[36] and cardiovascular issues.[37] Consequently, the birthing parent's obstetrician and health care team should be in close communication with their oral health provider to screen for and address oral health problems that may exist prior to and during pregnancy.[38, 39]

In adulthood, periodontal disease is linked with both diabetes and cardiovascular disease. Periodontal disease and diabetes have a bidirectional relationship, in that individuals with diabetes are at increased risk of developing periodontal disease, and individuals with periodontal disease are more likely to have uncontrolled glucose levels.[6–8] Adults with periodontitis, a severe stage of periodontal disease, are at a significantly increased risk of stroke, ischemic heart disease, and peripheral artery disease compared to adults without periodontitis.[9, 10] This connection highlights the critical need for oral health providers to be in close contact with PCPs, endocrinologists, cardiologists, nurses, and other health professionals.[40–43]

Throughout the lifespan, poor oral health is linked with mental health conditions such as major depressive disorder and eating disorders. Individuals with depression have been found to have more unmet dental needs (e.g., dental caries/decay) and to be less likely to seek oral health care than individuals without depression.[11, 12] Additionally, oral health professionals are in an ideal position to detect signs of eating disorders, such as lingual erosion associated with bulimia nervosa.[13, 14] Oral health providers, while not trained to provide behavioral health care for conditions like major depressive disorders or eating disorders, are in an excellent position to screen for such conditions and to refer to and collaborate with medical and/or behavioral health providers as appropriate.

In older age, poor oral health, specifically periodontal disease, has been linked with an increased risk of Alzheimer's disease and related dementias.[20, 21] With older age also comes a higher hospitalization rate for any number of health conditions.[44] Individuals who are hospitalized and have missing teeth and/or heavy dental plaque are at increased risk of developing hospital-acquired pneumonia.[45] As approximately 67 million adults in the United States rely on Medicare to help pay for their health care,[46] and traditional Medicare does not cover dental treatment,[47] the integration of oral health care (e.g., screenings for periodontal and other oral diseases) with other forms of health care becomes even more important.

Importance of IPP in Oral Health

Interprofessional programs in oral health are crucial for several reasons:

Improved Patient Outcomes: Collaborative care improves the quality of patient care. For instance, early detection of oral disease in medical settings or systemic conditions in dental clinics can result in better health management and disease prevention. Effective collaboration between health professionals ensures better monitoring and management of both oral and systemic health.[4, 48, 49]

Better Management of Complex Health Conditions: Many medical conditions, such as diabetes, hypertension, and cardiovascular diseases, have significant oral health implications. By fostering collaboration between dental

professionals and other health care providers, IPP can lead to more effective management of these complex conditions. The management of conditions like diabetes, which has known oral manifestations, is significantly improved when dental professionals and endocrinologists work together.[50]

Enhanced Education for Health Care Providers: IPP allows for a more holistic approach to training, in which dental professionals learn about the roles of other health care providers. This can improve communication and the ability to address patient needs in a coordinated manner.[33] Students and professionals alike benefit from understanding how collaboration can streamline treatment and improve patient care outcomes.

Advancement of Public Health Goals: Interprofessional collaboration is critical in public health initiatives, such as reducing oral health disparities in underserved populations. Team-based care can reach more individuals, ensuring that preventive care, such as dental screenings, is included in broader health care programs.[51] Collaborative care teams can better address the needs of underserved communities by combining resources and expertise.

The evolution of IPP in oral health reflects a shift toward more integrated care models that prioritize collaboration among health care providers. By continuing to foster interprofessional education and practice, the oral health field can enhance patient outcomes and contribute to the broader goal of improving global health.[52]

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Examples Highlighting Oral Health IPP Programs

A comprehensive review of all successful and effective IPP programs that include oral health is well beyond the scope of this white paper. Indeed, each year, more programs are applying innovative methods of integrating oral health with other health care professions, and the use cases that will accompany this white paper showcase several of these programs. Additionally, the scientific literature contains examples of such IPP programs, which can serve as models for those wishing to implement their own IPP activities across the lifespan.

In IPP programs aimed at improving the oral health of children, medical professionals (e.g., pediatricians and PCPs) often provide oral health assessments and fluoride varnish, among other oral health services. The Medical Oral Expanded Care (MORE Care™) program integrates oral health assessments, fluoride varnish applications, and patient oral health–related self-management goals into primary care settings.[24, 53] After three collaborative learning sessions with participating clinics across four states, the percentage of pediatric patients receiving oral health assessments from their medical providers increased from 47% to 77%, fluoride varnish applications across dental visits increased from 25% to 40%, and the percentage of children with oral health self-management goals increased from 25% to 62%. The Rocky Mountain Network for Oral Health Integration tested three models of integrating preventive oral health services (POHS) into community health centers.[54] Model 1 involved the delivery of POHS by medical providers; Model 2 involved the delivery of POHS by embedded dental hygienists; and Model 3 was a hybrid of Models 1 and 2, involving both medical providers and dental hygienists. All three models consisted of increased oral health services, dental referrals for children at high risk of caries, and the establishment by parents/caregivers of an oral health goal for their child. The greatest improvement was seen with the hybrid Model 3. Both MORE Care™ and the Rocky Mountain Network for Oral Health Integration demonstrate how oral health services can be integrated into primary care settings to improve children's oral health.

The Virtual Dental Home project in California utilized teledentistry to triage and provide treatment for children in elementary schools and Head Start centers, adults with developmental disabilities living in residential facilities, and vulnerable older adults living in long-term care facilities, as well as children and adults in community centers.[55] In this project, dental hygienists use portable imaging equipment and electronic dental records to gather clinical information on children and adults in community settings, which they then share with collaborating dentists.

The dentists then create treatment plans, and at the community locations, dental hygienists complete the aspects of the treatment plans that are within their scope of practice under the general supervision of a dentist, eliminating the need for patients to travel to dental clinics for preventive care. This program demonstrates effective collaboration between dentists, dental hygienists, and facility staff at these diverse locations to provide triage and oral health treatment for children and adults who otherwise lack access to adequate oral health care.

Another approach is to integrate health screenings into dental settings to help reach adults who visit a dentist but not a physician. For example, in 11 dental offices and one community health center, more than 1,000 adult dental patients who were unaware of their diabetes status were screened using a chairside HbA1c (blood glucose) testing protocol and referred to physicians for follow-up as needed.[56] Of those screened, 12.3% were ultimately diagnosed with diabetes and 23.3% with prediabetes. In another study, adults with no previously known hypertension had their blood pressure measured at regularly scheduled dental appointments.[57] One in five (20.6%) adults screened had blood pressure readings of 160 mmHg systolic and/or 90 mmHg diastolic and were referred to their primary care provider for follow-up. Of those who were referred for follow-up, 32.1% received a diagnosis of hypertension. Both studies highlight the importance of screening for systemic health conditions in the dental setting to identify at-risk individuals who may not receive regular medical care.

One study examined integrating oral health screenings and dental referrals into a primary care setting for Medicaid-enrolled adults aged 55 and older.[58] Medical providers were trained in screening for oral health problems and referring for dental care when appropriate. Of the 80 adults treated by the participating medical providers, 94% reported that their medical provider spoke to them about oral health, 60% had not seen a dentist in the past year, and 66% requested a referral to a dentist from their medical provider. Seventy-five percent of those receiving referrals then scheduled dental appointments. Another study enrolled dentists, dental hygienists, speech therapists, and nurses in an interprofessional collaboration to care for elderly patients living in a residential facility.[59] The interprofessional team developed personalized treatment plans for each resident. The nurses on staff then completed daily tailored oral health care practices for each patient, and the dental hygienists completed weekly dental cleanings. After 12 weeks, the microbe counts on residents' tongues were significantly lower than at baseline. These studies emphasize the importance of interprofessional collaborative care in improving and maintaining oral health in older adults.

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IPP programs like the ones described here are increasingly integrating oral health into broader health care systems to improve access and outcomes across all age groups. Whether oral health assessments are conducted in primary care settings, or systemic health condition screenings are implemented in dental settings, these examples highlight the effectiveness of integrating oral health into diverse health care environments for patients across the lifespan.

Interprofessional Education as a Foundation for Interprofessional Practice

Understanding the oral-systemic connection throughout the lifespan is key for implementing successful IPP models. For many oral health care professionals, an introduction to the oral-systemic connection and IPP comes during their training years. Dental students and dental hygiene students often engage in interprofessional education (IPE) activities with other health profession students, such as those from medicine, nursing, pharmacy, social work, and others. As noted in the Introduction, the WHO defines IPE as a means of learning in which health professions students "learn about, from, and with each other."[2] The goal of IPE is to prepare upcoming generations of health care professionals to provide high-quality, comprehensive, integrated health care by collaborating seamlessly with those in other health professions.

IPE standards for dental and dental hygiene education are set forth by the Committee for Dental Accreditation (CODA) for both predoctoral dental[60] and dental hygiene programs.[61] Dental students must demonstrate competence "in communicating and collaborating with other members of the health care team to facilitate the provision of health care."[60] Similarly, dental hygiene students "must be competent in interprofessional communication, collaboration, and interaction with other members of the health care team to support comprehensive patient care."[61] Key to both sets of competencies is effective *communication* and *collaboration* with other members of the health care team.

In addition to IPE standards for dental and dental hygiene students put forth by CODA, the Interprofessional Education Collaborative (IPEC) provides core competencies for 22 professional education associations that represent most of the health education programs in the United States.[62] The American Dental Education Association (ADEA) was one of the six original health profession organizations to help establish IPEC in 2009.[63] Updated most recently in 2023, the IPEC standards include the core competencies of Values and Ethics, Roles and Responsibilities, Communication, and Teams and Teamwork, along with 33 subcompetencies distributed across the four core competencies.[4, 62]

The white paper titled "Transforming Oral Health Care Through Interprofessional Education" by CareQuest Institute for Oral Health explores how integrating oral health into IPE can improve collaborative, patient-centered care.[4] It highlights the importance of including oral health in broader health education due to its strong links with systemic conditions such as diabetes mellitus[6–8] and cardiovascular disease,[9, 10] as will be discussed below. This white paper outlines current IPE practices, challenges such as curriculum constraints and lack of standardized assessments and offers recommendations for sustainable implementation. Through use cases from 19 institutions,[5] it emphasizes the need for institutional support, faculty engagement, and standardized yet flexible IPE frameworks.

As has been described, a life course approach to IPP ensures that individuals receive whole-person, comprehensive, and integrated health care from birth through older age. As each life stage presents its own unique developmental and environmental challenges to oral health, it is important for all health professionals to understand these challenges and be prepared to screen, refer, and treat all individuals throughout the course of life as appropriate. Examples of these unique challenges by life stage and how these challenges can be addressed through IPP are described in greater detail below.

The goal of interprofessional education is to prepare upcoming generations of health care professionals to provide high-quality, comprehensive integrated health care by collaborating seamlessly with those in other health professions.

A Lifespan Theoretical Perspective in Oral Health

A life course approach encompasses everything — the individual, their health behaviors, genetics, experiences in utero, social environment, life trajectories, and the historical events that happened during their lifetime. This approach looks at families, neighborhoods, nations, and all the exposures and experiences that accompany these larger entities. A life course approach also looks forward and backward in time, focusing on trajectories and transition points.[64, 65]

In this way, a life course approach mirrors complexity science[66] more broadly — it is no longer about the association between X and Y but rather about creating a map of this association across the additional dimension of time. A life course approach can also be considered analogous to the Human Genome Project, where the goal is not to look at how just one gene or one set of genes influences a specific outcome but to try to map the entire genome and all possible relevant outcomes.[67] A life course approach takes the Human Genome Project a step further. This ambitious approach examines both the genome and everything else — i.e., the exposome.[68]

This ambition is justified because this is also the era of Big Data.[69] Researchers now have access to data sets upon data sets — administrative data sets, longitudinal data sets, nationwide data sets, and historical data sets. Data sets can also be integrated by linking individuals across data sets or creating "statistically probable" individuals based on shared characteristics within different data sets. Researchers can then construct very complicated models with these massive data sets in ways that were never before possible, enabling even more novel methodologies.[70, 71]

As befitting an approach this all-encompassing, the experts working on life course approaches come from all scientific backgrounds: sociology, developmental psychology, epidemiology, genome research, microbiome research, etc. This collaboration allows for the interaction of all these other disciplines and each's unique contributions. A life course approach asks, "How do we integrate these disciplines and their various approaches to understanding particular phenomena?"

Key Concepts in a Life Course Approach and Oral Health Applications

While a life course approach is meant to be, in general, all-encompassing, researchers have found that the following concepts help ensure that their efforts have this broad perspective. The following section details these key concepts and their applications in oral health.

1. *Lifespan*

   The lifespan approach looks at how disease presents across an individual's entire life, from prenatal exposures to death, and can be broken into distinct life stages. For most chronic diseases, including caries and periodontal disease, it is straightforward to see how these diseases evolve over time. A lifespan approach, particularly from a policy perspective, prompts the question, "What can we do earlier in an individual's life course to prevent or lessen the disease we see later in life?" For example, in dentistry, the Restorative Cycle concept, where each sequential dental restoration is larger and more aggressive than earlier interventions, argues for the importance of preventive and minimally invasive approaches earlier in life.[72] From the perspective of interprofessional practice, certain health care professionals are more or less involved in an individual's life course at different life stages. So, for example, pediatricians and child health care providers need to understand dental diseases in childhood, obstetricians/gynecologists (ob-gyns) and emergency medicine physicians should identify dental diseases in early adulthood, and geriatricians benefit from knowledge of oral health conditions in later life. Oral health care professionals see individuals across their life course, so they should also be aware of the medical issues that may present at specific points in individuals' lives.

2. *Trajectories*

   The concept of trajectories acknowledges that some lives that start out less fortunate, with fewer resources or a genetic predisposition for a certain type of illness, can stabilize over time, and the risk factors that were present early in life do not manifest later in life. An alternative trajectory would be to have been born with many resources or genetic strengths, but then through the course of hardships in life end up with a worse outcome than would have been predicted at the start. For example, while certainly many children with early childhood caries go on to develop adult caries, this is not uniformly true for all.[73] Trajectories also look at the progress of a health state or disease; some diseases have a linear progression, others exponential, and still others have cyclic manifestations. Oral health most neatly fits within a linear framework, but it can be argued that once an individual becomes edentulous, their oral health stabilizes even if other conditions that are affected by edentulism, such as sleep apnea, progress.[74, 75]

3. *Transitions*

   Transitions are moments of dramatic change. The first day of school, graduation from college, buying a house, marriage, the death of a parent, retirement — all of these transitions are recognized by society as affecting how daily life is organized and entailing a sense of a discontinuity, with a distinct "before" and "after." A life course approach recognizes that health can be particularly vulnerable at these transition points, when new habits must be adopted and new ways of being accommodated. Dramatic changes in states of health may also be considered transitions: the moment of a heart attack, a cancer diagnosis, or a car accident marks time into discrete segments. In oral health, access to oral health care often changes with the transition of retirement, which is marked by both changes in daily routines and a loss of insurance benefits.[76]

4. *Critical/Sensitive Periods*

   The theme of critical and/or sensitive periods (some theorists use the term "critical," others "sensitive," both with the same intent) focuses on certain periods in an individual's life when the magnitude of impact is greater than during other periods. In oral health, the time of late adolescence is a moment in time where wisdom teeth are most easily extracted — they are formed enough to be taken out, but not so formed that the surgery is more difficult. At the same time, however, adolescence is also a critical period for exposure to opioids, a potentially addictive substance.[77, 78]

5. *Cumulative Impact*

   Exposures that add up over time from birth onward can contribute positively or negatively to health, such that someone who is older is going to have more accumulated risk than someone who is younger. At the same time, someone who is older will have more agency and ability to control their own environment. Cumulative impact looks at the combination of both risk factors and protective elements that, over time, cause a person's health trajectory to move in one direction or another.

6. *Agency and the Capacity for Change*

   The theme of agency acknowledges that individuals can influence their own health and change their trajectories. An oral health example could be that of a twenty-something individual who did not have regular access to dental care as a child because of economic and social hardship. As an adult who now has a regular income, insurance, and the ability to independently attend appointments, they want to take better care of their teeth so they can avoid the outcomes they saw afflict their older relatives.

7. *Linked Lives*
   The idea of linked lives recognizes that individuals know others in their social networks of families, friends and coworkers, and those who are "linked" tend to eat similar foods and share similar habits. Particularly within households, shared diets are common, and when diets include packaged foods and snacking between meals, the whole family will have a higher caries risk than families who eat more fresh produce and have meals at designated intervals.

8. *Historical Time*
   The theme of historical time looks beyond the individual and their immediate family and environment to the broader historical trends of the time. Historical time also considers the influence of being part of a generational cohort, such as the Baby Boomer generation or Generation Z. The prevalence of smoking, the expansion of automobiles and proliferation of fast-food restaurants… even the presence of war and its associated violence and deprivation all affect each historical cohort as a group, and each cohort as a group differs from those who came before and after. Patterns of infectious illness, including the COVID-19 pandemic, and transformations in medical care should also be considered part of historical time. An oral health example is that of community water fluoridation. The Baby Boomer generation did not have the same level of access to fluoridated water as subsequent generations and therefore had higher levels of decay. Subsequent generations, meanwhile, did have fluoridated water and healthier teeth. As some states are beginning to move away from community water fluoridation, the impact on the oral health of future generations is not yet known.

Building on the foundational concepts of a life course approach, it becomes essential to examine how oral health evolves throughout the various stages of life. From infancy through old age, each life stage presents unique challenges, opportunities, and interventions that shape oral health outcomes. The following section explores these stages in detail, highlighting how oral health needs and care strategies shift across the lifespan and the importance of IPP in addressing those oral health needs.

Early Childhood

Unique Oral Health Needs During Early Childhood Development

Oral health plays a critical role in the overall well-being and development of children. From infancy through early childhood, the oral cavity undergoes rapid changes as primary teeth emerge, supporting essential functions such as eating, speech, and facial development. However, the thin enamel of primary teeth, coupled with immature oral hygiene habits and developing dietary behaviors, leaves young children particularly susceptible to dental disease. Recognizing these developmental vulnerabilities is essential for timely and effective preventive care.[79]

IPP is critical for early prevention among young children. While current practice guidelines emphasize the safety and importance of dental visits by the time of eruption of the first tooth or by the first birthday, many parents/caregivers and dental providers are still uncomfortable, misinformed, or do not see the value of dental care for primary teeth that children will not retain for a lifetime. Education of dental and medical health professionals and parents/teachers is needed to communicate the importance of routine preventive dental care for young children. Oral health screenings and preventive services such as fluoride varnish are already permissible in most states for application by medical care providers, and medical billing codes include dental procedures. Awareness of the prevalence of oral disease among children and its negative impact on child development can promote a unified IPP approach to oral health among young children.

Oral Health Challenges in Early Childhood: Focus on Early Childhood Caries (ECC)

Early childhood caries (ECC) is the most common chronic disease of childhood, affecting millions of children worldwide — particularly those from low-income, minority, and medically underserved backgrounds.[80] ECC often begins before a child's first birthday and, without intervention, progresses rapidly. It can lead to pain, infection, impaired growth, poor academic performance, and a diminished quality of life. Decades of research on ECC prevention underscore the importance of early risk assessment, anticipatory guidance, and upstream prevention strategies as vital tools in combating ECC.[81] ECC is strongly influenced by the social drivers of health (SDOH), including food insecurity, lack of oral health literacy, and limited access to culturally competent dental care.[82]

Role of IPP in Early Prevention of ECC

IPP brings together a range of health care professionals — including pediatricians, pediatric dentists, nurses, and community health workers (CHWs) — to deliver integrated, family-centered care. IPP models enable providers to share responsibility for early oral health interventions, breaking down traditional silos between medicine and dentistry. Many academicians and experts have championed IPP as a strategy to close equity gaps in oral health, highlighting the success of programs where pediatricians apply fluoride varnish and CHWs provide culturally relevant oral health education.[81, 83] These models have been shown to reduce ECC incidence, improve referral pathways, and create dental homes for young children.

Collaboration Between Pediatricians, Pediatric Dentists, and Community Health Workers

Effective ECC prevention depends on coordinated teamwork across sectors. Pediatricians often serve as the first point of contact for infants and toddlers, offering repeated opportunities to assess oral health risks and deliver key preventive services during routine well-child visits. Pediatric dentists offer specialized care and are essential in establishing early dental homes. CHWs contribute uniquely by addressing social barriers, facilitating education, and connecting families with needed resources. The Infant Oral Care Program (IOCP), in which children from low-income families are provided with early and ongoing oral health care in community health clinics in conjunction with wellness visits with pediatricians, exemplifies this collaborative model, offering a comprehensive, interdisciplinary approach to oral health promotion and disease prevention in infants and toddlers — particularly those in high-risk populations.[84]

Integrating Oral Health into Well-Child Visits and the "Age One Dental Visit"

Both the American Academy of Pediatrics (AAP) and the American Academy of Pediatric Dentistry (AAPD) recommend that children establish a dental home and attend their first dental visit by age 1.[85, 86] This "Age One Visit" policy is rooted in evidence demonstrating that early dental visits are associated with lower rates of ECC, reduced dental treatment costs, and improved long-term oral health outcomes.[79, 86] Integration of oral health services into pediatric well-child visits supports this policy, enabling early screening, caregiver education, and preventive interventions such as fluoride varnish. Medicaid covers fluoride varnish and oral health examinations for infants and toddlers when provided during medical visits.[87] The efforts of the IOCP have demonstrated the real-world impact of operationalizing this policy, reducing ECC rates and promoting oral health equity from the very first year of life.[81]

IPP brings together a range of health care professionals — including pediatricians, pediatric dentists, nurses, and community health workers — to deliver integrated, family-centered care.

Another successful IPP program that includes oral health promotion is within the federal program Head Start, which serves children from families who have lower income, experience housing instability, are connected to Child Protective Services, or experience other societal inequities.[88] Head Start provides a safe learning environment for preschoolers, which includes an emphasis on healthy food, exercise, emotional regulation, and kindergarten readiness. There is a whole-student and whole-family approach to Head Start services, including connecting families to food or housing assistance and ensuring that kids are completing routine medical and dental visits and any related care. Some oral health programs, such as Apple Tree Dental in Minnesota, have established outreach relationships with Head Start programs to provide oral health screenings, preventive services, and care coordination.[89]

School-Aged Children and Adolescents

Unique Oral Health Needs During Childhood and Adolescent Development

Children typically start losing their primary/deciduous teeth around the age of 6, with permanent first molars erupting around 10–11 years old and second molars erupting around 12–13 years old.[90] This period — from early childhood through late adolescence — represents a dynamic and transitional phase marked not only by significant dental and skeletal development, but also by rapidly evolving social and emotional needs. Accordingly, the oral health of children in this stage is a "moving target," involving unique challenges that require oral health care approaches attuned to both their developmental physiology and their changing psychosocial environment.

Children and adolescents aged 6–18 years old who experienced ECC before the age of 6 are three times as likely to develop caries in their permanent teeth than children without ECC.[91] This discrepancy underscores the notion that the oral health trajectory is often established well before children reach school age, highlighting the critical importance of preventive efforts in the earliest years of life.

Children's ability to brush their own teeth effectively develops with age. Studies consistently demonstrate that 6-year-old children are less effective in removing plaque from their teeth than 12-year-olds; younger children also brush for less time than older children[92, 93] and often use more toothpaste than recommended by the Centers for Disease Control and Prevention (CDC).[94] Due to developmental changes in children's ability to brush their teeth effectively, it is recommended that parents/caregivers assist with and supervise their children's brushing until approximately the age of 10.[92]

A Cochrane systematic review found that fissure sealants placed on the occlusal surfaces of first permanent molars in children and adolescents aged 5 to 10 years old reduced caries incidence by 11%–51% when measured at 24 months and against no sealants.[95] In another Cochrane review, researchers found that fluoride varnish provided "a substantial caries-inhibiting effect" when applied to both primary and permanent teeth in children and adolescents up to age 16.[96] A third Cochrane review compared sealants to fluoride varnish and found no notable differences between the two methods in terms of reducing caries rates.[97] Research to date emphasizes

the importance of proactive measures by oral health providers — whether through application of sealants, fluoride varnish, or both — to reduce caries incidence in children and adolescents as their patients transition from primary to permanent dentition.

The pre-adolescent and adolescent years represent a unique window of opportunity for orthodontic intervention — both biologically, before palatal sutures begin to fuse, and psychosocially, as dental aesthetics can significantly affect self-esteem and social development during this formative period. The American Association of Orthodontists estimates that approximately 3.15 million children and adolescents between the ages of 8 and 17 were receiving orthodontic treatment in 2022, based on a survey of their members.[98] Children and adolescents in orthodontic treatment are at an increased risk for white spot lesions (WSLs), or areas of chalky enamel demineralization that are a result of plaque buildup, particularly around orthodontic brackets, ligatures, and arches.[99] WSLs can be aesthetically problematic and can increase caries risk in these areas of demineralization.[100] While WSLs are less common among patients receiving orthodontic treatment with clear aligners compared to fixed appliances,[101] a systematic review found that more than one third (35%) of adolescent patients treated with clear aligners developed WSLs.[102] While WSLs are sometimes reversible with intervention,[103, 104] preventive methods during orthodontic treatment include good oral hygiene with fluoridated toothpaste use and regular prophylaxis with topical fluorides.[105]

Late adolescence represents a pivotal period for evaluating third molars ("wisdom teeth"), as this is typically when these teeth begin to emerge and can be assessed for positioning, impaction risk, and potential complications. Early identification at this stage allows for proactive decision-making before root development is complete or pathology arises. Approximately 10 million individuals have their third molars removed each year, most of them adolescents and young adults.[106] Most general dentists who recommend that their adolescent patients have their third molars removed do so to prevent future problems, rather than due to symptomatology or signs of pathology.[107] Yet surgery to remove third molars is not without risks, including damage to the inferior alveolar nerve,[108, 109] which may be temporary or permanent. The decision to extract third molars is ultimately up to the patient, their parents/caregivers (in the case of minors), and their oral health provider, and should take into account whether the third molars show signs of disease such as periodontal disease and non-restorable caries.[110]

Oral Health Challenges in School-Aged Children and Adolescents: A Growing Public Health Concern

Oral health is a fundamental aspect of general health and well-being, yet it remains one of the most neglected areas in pediatric populations, particularly among school-aged children and adolescents.[111] The increasing availability of sugary foods, lack of adequate home care supervision, and broader social drivers such as socioeconomic status and access to dental care collectively contribute to an alarming rise in oral health issues among this vulnerable age group.

With the widespread availability of sugar-laden snacks and beverages in schools and homes, and through marketing campaigns targeting youth, there is a marked increase in the risk of dental caries.

Increased Access to Sugary Foods and Beverages

Diet plays a critical role in the oral health outcomes of children and adolescents. With the widespread availability of sugar-laden snacks and beverages in schools and homes, and through marketing campaigns targeting youth, there is a marked increase in the risk of dental caries. Frequent consumption of sugar facilitates the proliferation of acidogenic bacteria such as *Streptococcus mutans*, which contributes to demineralization of tooth enamel.[112] The Centers for Disease Control and Prevention (CDC) report that approximately 13% of children aged 5 to 19 have untreated dental caries, a statistic closely linked to dietary habits.[113]

Moreover, school environments often provide a dearth of healthy food options. Vending machines and cafeterias are frequently stocked with sugary sodas and snacks that offer little nutritional value and significant cariogenic potential. This exposure, combined with inconsistent oral hygiene practices, exacerbates the burden of dental decay in this population.

Oral Hygiene Practices and Parental Supervision

Another key factor that can contribute to poor oral health outcomes in children and adolescents is changes in oral hygiene practices as parental/caregiver supervision relaxes.

Younger school-aged children typically require assistance or reminders to brush effectively, especially before bedtime. However, studies show that many children brush for less time than the recommended two minutes and may not use fluoridated toothpaste consistently.[114, 115] Adolescents, seeking independence, may neglect daily routines such as brushing and flossing,[116] leading to an increase in plaque accumulation and gingival inflammation.

Parental knowledge and modeling of oral hygiene also play a critical role. When parents/caregivers have lower oral health literacy levels, their children may experience poorer oral health, such as increased prevalence of dental caries.[117] A lack of awareness or prioritization of dental care by parents/caregivers can inadvertently shape poor lifelong habits in children. This can be particularly true in low-income households, where competing priorities and limited resources may place oral hygiene lower on the list of concerns.[82]

Socioeconomic and Access-Related Disparities

Socioeconomic factors remain among the strongest predictors of oral health disparities in children. Children from low-income families are more likely to experience untreated caries, less likely to visit a dentist regularly, and less likely to have access to preventive services such as sealants and fluoride varnish.[118] Geographic disparities also exist; rural and underserved areas often face a shortage of dental providers who accept Medicaid, leading to long wait times or travel distances that deter regular care.

Children from low-income families are more likely to experience untreated caries, less likely to visit a dentist regularly, and less likely to have access to preventive services such as sealants and fluoride varnish.

In school settings, while some institutions have integrated oral health screening and fluoride programs, these initiatives are far from universal. A more structured and policy-driven integration of school-based oral health programs, particularly in Title I schools, could play a pivotal role in addressing these gaps.

Identifying Sleep Health Issues

Oral health professionals are qualified to identify poor sleep health in children through the development of the oral and maxillofacial complex, which includes the hard and soft palates, tongue, teeth, and surrounding soft tissues.[119] Signs of bruxism — wear on the teeth from grinding them together — and acid erosion on the teeth can also be indicators of poor sleep health.[120] Poor sleep health, which includes obstructive sleep apnea, can further be identified by enlarged tonsils and frequent infection of the tonsils.[121] Acid erosion, in addition to signaling poor sleep health, could also be an indicator for another health issue called gastroesophageal reflux disease (GERD).[122]

Adolescents, seeking independence, may neglect daily routines such as brushing and flossing, leading to an increase in plaque accumulation and gingival inflammation.

Psychosocial Impacts and Academic Performance

The implications of poor oral health extend beyond the dental chair. Pain, infection, and social embarrassment due to visible caries or bad breath can affect a child's quality of life and school performance. Dental problems are among the leading causes of school absences in children, which can hinder academic achievement and social development.[123] Additionally, untreated oral disease can affect self-esteem and social interactions, particularly during adolescence, a critical period of emotional and psychological development. Adolescents with visible dental problems may face bullying or exclusion, which can exacerbate mental health challenges already prevalent in this age group.

The Importance of IPP in Childhood and Adolescent Oral Health

The school setting presents a unique platform for harnessing community resources, incorporating a diverse range of health care professionals, educators, social workers, and families from various backgrounds. Consequently, contemporary practice underscores the importance of establishing healthy schools, which prioritize the creation of environments that foster the physical, emotional, and social well-being of students. IPP within healthy schools serves as a robust framework for early preventive oral health care, uniting diverse professionals to effectively address the oral health needs of school-aged children and adolescents. By utilizing the school context, IPP can instill lifelong oral hygiene habits and mitigate oral health

disparities. Collaboration among health care professionals, educators, social workers, and parents/caregivers is vital for identifying and addressing oral health challenges.

Specific Approaches to IPP for Early Prevention of Oral Disease

Preventive education delivered by teachers, school nurses, and other professionals plays a crucial role in promoting positive behavior change regarding oral health. Disseminating oral health messages through multiple channels, including educators and school health personnel, aligns with the social-ecological model of health promotion. It is essential to provide children and families with consistent oral health resources through interpersonal, organizational, community, and, significantly, "healthy schools" policies.

Early detection of oral health risks can be overseen by pediatricians and school nurses, who are often more accessible to children than dentists.

Early detection of oral health risks can be overseen by pediatricians and school nurses, who are often more accessible to children than dentists. With appropriate support, these professionals can function as early screeners and administer preventive therapies such as fluoride varnish.[124] This early intervention can lead to significant positive outcomes when complemented by a well-defined care pathway and adequate social support.

In cases where barriers hinder access to optimal oral health behaviors or early detection in the school setting, psychologists, counselors, and social workers can support families in overcoming social, behavioral, or environmental obstacles.

Challenges and Solutions

While numerous evidence-based strategies exist for early intervention in oral disease, significant challenges remain. For school-aged children, optimal nutrition, physical activity promotion, mental health support, and chronic disease prevention are interconnected, sharing common social, structural, and commercial drivers of health. Thus, IPP must strategically address these overlapping concerns in health initiatives to maximize community engagement, encourage collaboration across disciplines, and facilitate effective communication.

According to the health-promoting schools philosophy, "a health-promoting school is one that constantly strengthens its capacity as a healthy setting for living, learning and working."[125, 126] Along with emphasizing a common risk factor approach,[127] health-promoting schools serve as a key location for IPP activities. Furthermore, dedicated efforts are required to overcome inadequate funding for oral health initiatives and to advocate for the recognition of oral health as a critical component of overall well-being, essential for alleviating pain, enhancing social interactions, and improving children's self-esteem.[128]

Strategies for Implementing IPP in Schools

Due to the complexity of oral health challenges, IPP initiatives aimed at the early management of oral disease must not be overly simplistic or reductionist. These approaches should not be viewed as isolated solutions, but rather as interconnected entry points tailored to each community's unique characteristics.

Potential strategies for enhancing IPP in schools may include:

- Oral health workshops led by licensed dentists or dental hygienists, tailored for educational settings
- Incorporating oral health education into existing school curricula to reinforce key messages[129]
- Training school staff to recognize and address oral health issues proactively[130]
- Integrating dental teams into school environments to deliver preventive and early intervention services within school-based oral health clinics[131]

The selected strategy should reflect the specific needs and comfort level of each school setting, with the understanding that these strategies are part of a comprehensive approach to build effective IPP frameworks for early oral disease prevention. Embracing IPP as a vital philosophy is crucial for integrating oral health into the broader spectrum of care that supports the optimal health of school-aged children.

Addressing the oral health challenges of school-aged children and adolescents requires a multifaceted approach that includes dietary regulation; oral health education, particularly through motivational interviewing;[131, 132] increased supervision; and systemic changes in access to care. Health promotion initiatives should involve schools, families, and communities working in tandem to instill preventive behaviors early on. Expanding school-based dental programs, increasing awareness campaigns, and advocating for policy-level change remain essential strategies to reduce oral health disparities and promote lifelong wellness.

Young Adults and Adults

Oral Health Challenges in Adulthood

As individuals transition from adolescence into adulthood, their reliance on their parents/caregivers for good oral health habits falls away and they become responsible for their own oral health. With this new responsibility and stage of life come new oral health risks. Some of these risks to oral health relate to behaviors, such as tobacco and alcohol use. Other risks relate to physiological changes, such as pregnancy. Still others involve barriers to oral health care, such as lack of dental insurance and anxiety related to receiving dental care. While some of these challenges overlap with those faced by individuals in the earlier and later stages of life, some are more distinctive to the young and middle-age adult years, requiring particular types of interprofessional collaborations.

Periodontal Disease and Chronic Health Conditions

As noted in the Introduction, periodontal disease, which is seen in over 40% of US adults aged 30 or older,[133] is linked to several chronic health conditions that become significant considerations in adulthood. For example, adults suffering from periodontitis face a significantly higher risk of stroke, ischemic heart disease, and peripheral artery disease.[9, 10] Additionally, periodontal disease and diabetes have a bidirectional relationship, wherein individuals with diabetes are more likely to develop periodontal disease, and those with periodontal disease often experience uncontrolled glucose levels.[6–8] Periodontal treatment has been linked with lower overall health care costs in adults with diabetes.[134, 135] This link between periodontal disease and other chronic health conditions underscores the importance of close collaboration between oral health providers and PCPs, endocrinologists, cardiologists, nurses, and other health care professionals to ensure that patients' chronic conditions are effectively treated and managed for optimal health.[40–43]

Oral Health Effects of Medications

As individuals enter adulthood, they are likely to start using prescription medications for various chronic health conditions. The National Center for Health Statistics (2019) estimates that 47% of adults aged 20–59 currently use prescription medications, with women (56%) more likely to report taking prescription medications than men (38%).[136] The most used medications in this age group are antidepressants (11%), prescription analgesics for pain relief (8%), and lipid-lowering medications for high cholesterol (8%).[136] These medications and many others are known to cause a side effect of xerostomia (a feeling of "dry mouth" due to low salivary flow),[137–139] which worsens when individuals take multiple medications.[140] A case-control retrospective study of more than 1,200 adults aged 18–65 found that those with xerostomia were more likely

Another challenge that young adults may face when seeking dental care is their own fear and anxiety related to receiving such care.

than those without xerostomia to be taking dry mouth–causing anticholinergic medications and had higher caries rates than those without xerostomia.[141] Xerostomia is linked with a higher risk of caries[142] and oral candidiasis and oral fungal growth.[143]

Tobacco and Alcohol Use

Although some adolescents begin using alcohol and nicotine products — including cigarettes, electronic cigarettes (e-cigarettes), and smokeless/chewing tobacco — individuals can start buying these legally at the age of 21. With increased use of both alcohol and tobacco comes an increased risk of oral cancer.[144, 145] Tobacco use is also linked to periodontal disease.[146, 147] Meanwhile, the evidence for a link between chronic alcohol use and periodontal disease is mixed.[148, 149] Individuals who frequently consume alcohol often have poorer oral hygiene, less frequent dental care, and poorer oral health overall.[150] Oral health providers, PCPs, and other health professionals should be proactive in discussing tobacco and alcohol use with their patients to help patients improve their oral and overall health.

Pregnancy

As noted in the Introduction, pregnant individuals are at an increased risk of gingival inflammation and periodontal disease, particularly later in the pregnancy,[151] due in part to interactions of pregnancy hormones with factors such as increased plaque levels.[152] Periodontal disease is linked to adverse birth outcomes such as preeclampsia (pregnancy-induced hypertension),[15] preterm birth,[17] and low birth weight.[18] Receiving periodontal treatment during pregnancy may improve birth outcomes, although the evidence in this area is mixed.[153–155] However, pregnant individuals may also be hesitant to receive dental care during pregnancy due to concerns that dental treatment is not safe during pregnancy; both patients and dentists may have these concerns,[156–159] even though dental care is safe and encouraged during all stages of pregnancy.[160] In fact, several states have extended their Medicaid adult dental coverage to include care for pregnant and postpartum persons,[161] emphasizing the importance of maintaining good oral health care for both birthing parents and their infants.

Access to Care Issues

With increased independence from their parents/caregivers comes the need for young adults to take responsibility for their own oral health care. However, as these individuals enter adulthood, they may encounter unique challenges in seeking oral health care on their own, even if they were taken regularly to the dentist by their parents/caregivers as children and adolescents. For example, adults with lower incomes who do not have dental insurance or have Medicaid health coverage may have no or limited dental coverage. While many states have enhanced their Medicaid dental coverage to cover more adults,[161] dental coverage is usually one of the first benefits eliminated for adults when state budgets are cut.[162] Additionally, adults living in dental provider shortage areas (DPSAs), defined as areas with one dentist or fewer per 5,000 population, have more difficulty finding care that is easily accessible and may have to travel long distances to find care.[163, 164] For example, about 1.7 million people in the US do not have access to a dentist within a 30-minute drive, and 24.7 million live in a DPSA; those living in areas of lower socioeconomic resources and those living in rural areas are more likely to live in a DPSA.[165]

Another challenge that young adults may face when seeking dental care is their own fear and anxiety related to receiving such care. Individuals who were brought to the dentist by their parents/caregivers may, as adults, avoid necessary dental treatment due to their own fear and anxiety. Adults who avoid dental treatment often report that difficult or traumatic dental experiences as children made them less able to tolerate dental appointments as adults.[166, 167] Adults with high dental anxiety are more likely to avoid dental care than those with low dental anxiety.[168] Furthermore, adults may find themselves in a cycle of avoidance of dental care.[169, 170] In such a cycle, they avoid dental treatment due to fear and anxiety, and their oral health begins to deteriorate. By the time they seek dental care, they are often in pain and require more invasive dental treatment. This invasive dental treatment, in turn, reinforces their perceptions of dental care as painful and frightening, which then leads them to avoid further dental care until the next dental emergency.[169, 170] Perhaps not surprisingly, individuals with higher dental anxiety and less frequent dental attendance have more caries lesions,[171] more bleeding on periodontal probing,[172] and poorer self-reported oral health–related quality of life.[173]

Role of IPP in Care for Adults

The integration of oral health into primary care settings through IPP is a crucial step in delivering comprehensive health care for adults. The link between oral health and systemic health is well established, with studies highlighting the connection between periodontal disease and conditions

such as diabetes, cardiovascular disease, and respiratory infections.[4, 30] Consequently, integrating oral health into primary care allows for more effective and coordinated management of a patient's overall health.

Transforming oral health care through interprofessional education is vital to improving health care delivery.[4] This transformation emphasizes the importance of collaboration between dental and medical professionals to comprehensively address patients' health. One key recommendation is to incorporate oral health screenings into routine medical visits, which helps identify early signs of dental issues such as caries, periodontal disease, and oral cancer. Such screenings can lead to earlier interventions, preventing the escalation of oral health issues that may affect general health.

Medical professionals, including PCPs, are often the first point of contact for patients and can play a significant role in the prevention and management of oral diseases. Equipping PCPs with the knowledge and tools to conduct basic oral health screenings will enhance the early detection of oral diseases and improve referral rates to dental professionals when needed. Furthermore, when oral health is integrated into the primary care setting, patients are more likely to receive a holistic treatment plan that addresses both their medical and dental needs, improving overall outcomes.[2, 4]

Research has demonstrated that integrating medical and dental care results in better patient outcomes.

Research has demonstrated that integrating medical and dental care results in better patient outcomes. For instance, a study by Reeves and colleagues found that when medical and dental professionals work together, patients are more likely to adhere to preventive care and treatment regimens.[174] The integration of oral health into primary care is particularly beneficial for patients with chronic conditions like diabetes, where oral health issues can worsen disease management. Medical-dental integration not only improves the management of oral diseases but also reduces the long-term costs of health care by preventing more severe systemic conditions associated with poor oral health.[4]

Collaboration with Mental Health Providers, Pharmacists, and Chronic Disease Teams

In addition to collaborating with PCPs, it is critical for oral health providers to collaborate with other health professionals to provide their adult patients with comprehensive, whole-person care. A detailed description of how various health care professionals can engage with oral health providers can be found in the CareQuest Institute white paper and use cases describing interprofessional education.[4, 5] Examples include:

- Oral health providers can collaborate with behavioral health professionals to help patients reduce their dental fear and anxiety,[175–177] address mental health conditions like anxiety and depression related to chronic oral facial pain conditions,[178, 179] and help screen patients for substance use disorders and refer them for treatment as needed.[180]
- Social workers are instrumental in coordinating patient care needs related to social drivers of health, including housing, transportation, and dental insurance.[181, 182]
- Pharmacists are key collaborators with oral health providers due to their extensive knowledge of medication side effects and interactions between drugs, including those that are prescribed by oral health professionals.[183–185] Furthermore, pharmacists can consult with oral health providers about patients who have extensive medical histories and take multiple medications, putting them at increased risk for xerostomia.[186]

Oral health providers should also be key players in teams that manage adults' chronic health conditions such as diabetes, cardiovascular disease, oral cancer, and those faced by individuals with organ transplantation history.[40–43, 187] While much attention is paid to the oral health needs of children and older adults, the oral health care needs of adults in the younger and middle stages of life require the same attention and care.

Adults in the younger and middle stages of life face specific challenges to their oral health that overlap with, but are often distinct from, those faced by individuals in the younger and older phases of life — for example, orthodontic issues and early childhood caries in younger stages of life, and the development of periodontal disease and managing a work-life balance for regular dental visits in the middle stages of life. Interprofessional collaboration between oral health providers and other health professionals is key to maintaining good oral and overall health from childhood and adolescence through the transition to older age.

Older Adults

Oral Health Challenges Associated with Aging

As people age, their oral health needs evolve significantly. The aging population is particularly vulnerable to a variety of prevalent oral health challenges including xerostomia (dry mouth), tooth loss, and oral cancer. These conditions are often compounded by systemic diseases and polypharmacy, making comprehensive care essential.

Xerostomia is frequently caused by medications used to manage chronic diseases. Antihypertensives, antidepressants, and antihistamines are particularly notorious for reducing salivary flow. Saliva is essential for maintaining oral pH, facilitating digestion, and protecting against dental caries and oral infections. The effects of dry mouth can include difficulty eating and speaking, an increased risk of fungal infections, and accelerated dental decay.[188] One systematic review highlighted that approximately 60% of older adults experience dry mouth associated with polypharmacy, adversely affecting their quality of life and psychological well-being.[33]

Tooth loss remains a significant problem, even though oral health awareness has improved over time. Tooth loss is often a result of advanced periodontal disease, caries, or trauma. Beyond aesthetics, missing teeth affect speech, self-confidence, and the ability to eat a balanced diet. Malnutrition is a real consequence, particularly when denture fit is poor or access to prosthetic rehabilitation is limited.[30] Older adults who are edentulous (having lost all their permanent teeth) demonstrate signs of physical and cognitive decline.[189] While dental implants offer a solution, they are often inaccessible to older patients due to cost or other systematic barriers.

Oral cancer risk increases with age, especially among those with a history of tobacco or alcohol use. Squamous cell carcinoma, the most common type, often presents late in older adults due to missed opportunities for early screening. Human papillomavirus (HPV) and prolonged UV exposure (for lip cancers) are also contributing risk factors for oral cancer. Early detection remains critical, but many older adults do not receive regular oral cancer screenings, especially in institutional settings.[32, 34] Regular dental visits have been associated with earlier detection and improved survival rates in patients with head and neck cancer, including oral cancer.[52]

Addressing Oral Health Challenges in Older Age

Managing oral health in older adults requires a multidisciplinary approach involving dental professionals, primary care providers, and caregivers. Strategies include regular dental checkups, medication reviews to minimize xerogenic drugs, patient education on oral hygiene practices, and integration of oral

health into overall health care planning. Policy initiatives aimed at improving access to dental care for the elderly, especially those in long-term care facilities, are essential for addressing these challenges.[51]

Management of oral health in aging populations requires a multidisciplinary approach. Dental professionals must work closely with primary care providers and caregivers to monitor drug interactions, systemic health status, and oral function. Regular oral exams, individualized prevention strategies, and education about home care are crucial for maintaining oral and systemic well-being in the elderly.

In conclusion, xerostomia, tooth loss, and oral cancer represent significant yet manageable oral health challenges in older adults. When compounded by polypharmacy and systemic illness, these issues require careful coordination of care. With increased awareness, routine screenings, and personalized interventions, providers can improve both the quality of life and health outcomes for our aging population.

Importance of Interprofessional Care for Older Adults

Older adults who develop functional dependency or frailty depend on family and professional caregivers and may reside in long-term care facilities (LTCFs). To provide accessible and high-quality dental care, oral health professionals must collaborate with those support entities to promote routine dental care and to address emergent dental needs. Care coordination between dental and LTCF staff is essential to enabling safe and timely care provision. Innovative models such as mobile or community-based care and telehealth technologies can reduce barriers to oral care.

For example, Apple Tree Dental engages with LTCFs in the role of a Dental Director, which includes consulting on facility protocols, educating staff, and providing routine screening/triage/referral services. Some facilities host Apple Tree's on-site mobile dental program for comprehensive and continuous dental care, eliminating the need to transport residents with identified needs outside of the facility for dental care. In this program, dental professionals can also easily communicate with nursing and medical staff about dental care and overall health topics.

Older adults have a higher risk of experiencing comorbid health conditions, increasing their risk of functional limitations impeding dental homecare. These conditions potentially affect oral function and the ability to sense or communicate dental problems.[34] Patients who take more than five medications are defined as experiencing polypharmacy, which is associated with various oral health conditions such as dry mouth (xerostomia). Without proper salivary flow, oral health complications can occur, such as painful mucosal tissues; excessive friction from dental prostheses, which can lead to open sores in the mucosal tissues; insufficient cleansing of dental tissues, which can lead to higher risk of dental caries; increased risk of bacterial and fungal oral infections; and difficulty with oral functions (speaking, chewing, swallowing). Oral and systemic health professionals should collaborate to ensure that patients are on as few medications as necessary and determine if a patient would benefit from a salivary substitute or medication to induce salivary flow. Additionally, some medications have adverse oral mucosal side effects that should be collaboratively managed.

Older adults have a higher risk of experiencing comorbid health conditions, increasing their risk of functional limitations impeding dental homecare.

Interprofessional Care for Patients with Complex Medical Needs and Individuals with Disabilities

Adults with intellectual and developmental disabilities (IDD) face unique barriers to accessing high-quality care. Due to the bio-psycho-social complexity of this population, interprofessional collaboration is critical to safely provide them with clinical dental care. As a result, providers who care for these individuals often become fluent in IPP. This often involves collaborating directly with community support agencies, direct support staff, and specialty health care providers. Innovative models of care delivery may include mobile or community place-based care or services utilizing telehealth technologies. On the payment system level, some managed care or accountable care organizations create financial incentives for collaboration between specialty care providers to ensure a patient-centered, whole-person approach to care for this population.[190] In situations where adults with IDD require sedation and specialty behavioral management services to receive oral care, collaboration between oral and other health professionals occurs by necessity.

For example, Apple Tree Dental's Community Collaborative Practice model serves day programs and group homes for adults with IDD through a comprehensive mobile dental program, enabling collaborative care provision with direct support and medical staff. Apple Tree's Pediatric and Special Care Teams provide dental care to adults with IDD in outpatient settings with behavioral modifications or light (oral or nitrous oxide) sedation, in collaboration with nurse anesthesia providers for moderate conscious (intravenous) sedation, and with hospital-based operating rooms to provide dental care under general anesthesia.

For individuals who receive inpatient mental health care services, innovative models such as mobile or community place-based care and telehealth technologies can reduce barriers to dental care. Such outreach to inpatients facilitates collaboration with facility staff and coordination of health care services across disciplines. For example, Apple Tree Dental collaborates with Zumbro Valley Health Campus in Rochester,

Minnesota, to provide dental care to individuals who are receiving inpatient and outpatient mental health services at the facility; consultation with medical and mental health providers can occur more quickly and directly in this colocated setting.

Access to routine preventive and therapeutic dental care is very important for individuals who are struggling with substance use disorders (SUDs), in treatment for SUDs, or in recovery. Unfortunately, traditional dental settings pose several challenges for this population, including the lack of trauma-informed/nonjudgmental care approaches, lack of screening and referral resources for SUDs, the rarity of accepting public insurance, and potentially long wait times for treatment (as is the case in many safety-net clinics). Collaboration with health service organizations and professionals who screen for and treat SUDs is an important opportunity for oral health professionals to engage in an interprofessional manner to provide dental care to this population.

For example, Apple Tree Dental receives referrals from agencies like Minnesota Adult and Teen Challenge that support individuals with SUDs through residential treatment. Care coordination with this agency allows individuals who are in a recovery program to progress in their treatment plans in a timely manner that embeds oral health care into their overall recovery program timeline. This kind of care coordination allows dental providers to receive clear communication regarding pain management strategies for patients in treatment for SUDs, and dental providers can provide detailed reports to the agency on dental treatment status and outcomes.

Desensitization in Oral Health Care

In 1920, psychologist Albert B. Watson conducted a controversial experiment where he conditioned a 9-month-old baby boy, Albert, to fear a rat by pairing a loud noise with the presence of a rat.[191] In a counter-response to Watson's ethically questionable experiment, psychologist Mary Cover Jones decided that she would teach a child, Peter, to unlearn a fear of rabbits through gradual exposure and positive reinforcement. Jones is considered the pioneer of desensitization techniques.[192] In her 1924 "Peter" case, she describes how she taught the young boy to unlearn a phobia.[193] This case laid the foundation for future structured approaches to desensitization therapy aimed at gradually reducing emotional reactions to previously distressing situations. Mary Cover Jones's early work in desensitization paved the way for future work in the use of desensitization procedures with various environments and diagnoses.

Many individuals with IDD experience fear or distress during everyday care routines. Dental appointments, doctor visits, and haircuts can all present sensory or emotional challenges to individuals with developmental disabilities. One effective strategy used by behavior analysts and caregivers is desensitization. Desensitization is a gradual exposure technique that helps individuals become more comfortable with a feared situation by breaking it into small steps and reinforcing calm behavior at each stage. Desensitization techniques in the dental setting have been proven to be effective with populations exhibiting severe and profound intellectual disabilities,[194] as well as with autism spectrum disorder (ASD).[195] Altabet found that using dental desensitization procedures resulted in a 54% increase in completing dental procedure steps vs. 21% in the non-treatment group.[194] Carter and colleagues found that a combination of the following three desensitization techniques were effective in getting a child with ASD to attend dental cleaning appointments and to comply with all dental procedures:[195]

- **Gradual exposure:** presenting the child with aspects of a dental procedure in a systematic and stepped way to increase the child's comfort with each aspect. Aspects could include, for example, the child walking toward a dental chair, sitting in the chair, leaning back in the chair, then opening their mouth when asked.
- **Positive reinforcement:** giving the child a reward for successfully completing each exposure step. Rewards are identified at the beginning of treatment as what is most reinforcing for each child (e.g., verbal praise, a piece of a favorite food).
- **Reinforcement fading:** gradually delivering reinforcement less often for each successful exposure step, ultimately eliminating the reinforcement as the exposure behavior (e.g., the child opening their mouth when asked) is done consistently.

Medical appointments can also be frightening for many people, especially when they involve vaccines, blood draws, or even physical examinations. Applied behavior analysts (ABA) often use systematic desensitization, which involves exposing the person to less stressful parts of the procedure first, such as looking at a Band-Aid or hearing the alcohol wipe tear open. The goal is to move slowly through each part of the procedure until the individual can complete the task calmly. In a study by Shabani and Fisher, a child was taught to tolerate needle procedures using a combination of exposure and reinforcement.[196] They broke down the experience into small parts and gave the child praise and small rewards for staying calm. This approach reduced behavior problems and allowed the child to successfully complete medical tasks that had previously caused distress.

Haircuts often involve sensory sensitivities such as loud clippers, water sprays, and the feeling of scissors. For individuals with ASD or related conditions, ABA-based desensitization has been used successfully to help increase

tolerance. This might include showing the tools first, touching them to the head briefly, and then slowly increasing the amount of time they are used. Reinforcement is given for each successful step. Scattone and colleagues used video modeling and reinforcement to help children with autism become more comfortable with haircuts.[197] The children watched videos of others getting a haircut and were rewarded for participating in each step themselves. Over time, their anxiety decreased and they were able to complete a full haircut.

Desensitization is a key example of IPP in which ABA professionals collaborate with dental, medical, and other health care professionals to help individuals with special health care needs participate in important daily routines like doctor visits, dental checkups, and grooming. By breaking tasks into small, manageable steps and providing reinforcement, individuals with developmental disabilities can build confidence and reduce fear. With patience and consistent support, many clients learn to complete these tasks independently and without distress.

Practice Settings for IPP

One of the strengths of IPP is the diverse nature of clinical settings in which integrated care may be delivered. Just as the need for IPP is critically important across the lifespan, so is the need to deliver integrated care across several different kinds of traditional health care settings and non–health care settings.

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Integrated Care Clinics

Integrated care clinics are settings, including federally qualified health centers (FQHCs), where multiple types of health care professionals deliver care. These clinics are often based in primary care and include other health professionals providing care in oral health, behavioral health, pharmacy services, and/or addressing social drivers of health through public health professionals.[198] In addition to the clinical health care providers, these integrated clinics also frequently employ nurse managers and case managers to help patients access care. For example, the Southcentral Foundation is an organization that provides integrated care Alaska Native and American Indian communities near Anchorage, Alaska.[199] Such clinical settings are often based in primary care because "primary care is where most people seek any health care and where they are most likely to develop sustained, healing relationships focused on well-being that can contribute to overall population health."[198] This model aims not only to provide comprehensive care to its patients, but also to reduce the burden on PCPs and facilitate referrals to non–primary care health providers.[200] Patients express high levels of satisfaction overall with care in integrated clinics, particularly those with mild or moderate health conditions; patients with more severe or multiple health conditions express lower levels of satisfaction with their care and may benefit from higher levels of care.[201] Integrated care clinics can incorporate oral health in several ways, including training PCPs to do oral examinations and apply fluoride varnish,[23, 24] as well as integrating dental hygienists into obstetrics-gynecological care to care for pregnant patients.[202]

School-Based Health Centers

School-based health centers (SBHCs) extend beyond the traditional model of school-based health services (e.g., school nurses, counselors) to deliver primary care services as well as dental care, behavioral health services (including substance use disorder care), nutrition counseling, reproductive health services, and referrals, among other services.[25] One example of a SBHC system is the Washington School-Based Health Alliance, which consists of health centers in approximately 80 schools across Washington state.[203] There are approximately 3,900 SBHCs in the United States currently,[203] and oral health care services in SBHCs include oral health screenings, referrals, and application of fluoride varnish and sealants.[204]

Long-Term Care Facilities

Individuals living in long-term care facilities, including older adults and some individuals with disabilities, face risks to their oral health as described in the section on oral health in those

with special health care needs. Many individuals residing in long-term care facilities experience significant difficulty performing adequate oral hygiene practices and receiving care in traditional dental offices due to issues with mobility and other challenges.[205] Incorporating oral health care into long-term care facilities typically involves enlisting dental hygienists, in collaboration with the facilities' medical staff, to provide oral health screenings, prophylaxis, and formulation of treatment plans where possible.[26] Some dental organizations, such as Access Dental Care in North Carolina and Apple Tree Dental in Minnesota either bring mobile dental equipment to, or have established permanent dental operatories in, long-term care facilities to provide more comprehensive dental care to facility residents.[89, 206]

Mobile Health Clinics

Mobile health clinics bring integrated care to the communities in which the individuals in greatest need of care reside. While many people may be familiar with mobile dental clinics in which oral health professionals provide care,[207] integrated clinics include oral health care along with other services such as primary care, vaccinations, laboratory service, and other health screenings.[27] An example of such an integrated mobile clinic is the one run by Evangelical Community Hospital in Lewisburg, Pennsylvania, which provides "primary care visits, vaccinations, laboratory services, dental care services, and specialty care visits… blood pressure and blood glucose screenings, bone density heel scans, varying modes of point-of-care testing, and COVID-19 testing services" in a 38-foot mobile home across 37 zip codes. This mobile clinic focuses on bringing integrated care to individuals in underserved populations.[27, 208]

Sustainable Models for IPP

The time, effort, and infrastructure required for IPP can be demanding and not always consistent with traditional health care systems, threatening the sustainability of IPP. To effectively create, sustain, and evolve IPP models, continuous learning across disciplines and system levels is essential. In 2007, the Institute of Medicine (US) Roundtable on Evidence-Based Medicine created a learning healthcare system framework. This framework lays out important components of program improvement and evaluation, such as using evidence-based best practices, using meaningful data collection, collaborating with allied health care providers, and engaging in continuous learning and process improvement.[209] The sustainability of IPP models depends on evaluating the various contributors needed to implement IPP. This section will discuss how evaluation can be used to determine if key areas of IPP are successful. Criteria for the sustainability of IPP can be grouped into several important categories related to health care systems, organizations, and individuals. Each of these areas has been identified in the literature through formal and informal evaluation processes.

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Systems-Level Factors for IPP Sustainability

Systems-level factors can be thought of as large industry-wide influences such as historical health care constructs, health care policy, educational systems, and payment models. These are important to consider because larger systems can be the most difficult to influence when adapting patient care delivery models. It is often difficult to convince others to change the status quo, especially if they don't agree with the need for change.[210]

Historically, there has been a siloing of health care within care systems and between health care and oral health care.[211] Siloing of care often refers to health care providers only focusing on their area of expertise and not considering other factors that could be affecting a patient's oral or systemic health condition.[212] Siloing of care systems can occur at many levels, including oral and systemic health education, oral and systemic health policy, and payment models.

Interprofessional education (IPE) is an important way to bridge oral and systemic health care silos.[211–213] As indicated by CareQuest Institute for Oral Health and colleagues, there are many great health care and oral health care educational programs that include interprofessional curricula.[4] This is an area that students should look at closely when deciding which dental or medical school to attend in order to ensure they are receiving a person-centered education.[214]

Policies are the rules and regulations that guide and regulate specific behaviors or practices. Policies can be found at all levels of patient care, including medical or dental scope-of-practice laws, patient care organizations, and community, state, and national legislation. Policy should support each level of integration, such as IPE and collaborative practice and reimbursement models. Just wanting policy change is not enough. It is essential for providers and advocates to take an active role in creating policy, influencing legislation, and funding the collaboration process.[211–213]

Payment models are how providers are reimbursed for the services they provide to a patient.[211, 212] These can include direct payment from the patient, reimbursement from a third-party payer, or alternative payment models. Many payment models address either oral health or systemic health care reimbursement but not both.[87]

Organizational-Level Factors for IPP Sustainability

Organizational-level factors relate to the geographic location and operational structure of medical and dental care. Geographic location can refer to whether the care is provided in separate locations, how far away these locations are from each other, or if the care is colocated.[211] Colocation of services can also affect the ability to share patient records and the logistics surrounding health referrals. These are important factors to consider with IPP, because integrated care or collaborative practice models require teamwork, shared responsibilities, and open communication between health care teams.[215] It is important to have clear communication pathways and shared patient care expectations among all providers within an organization and within a health care system.[211–213] These factors need to be supported, modeled, and funded by organizational leadership.[213] Also, when implementing new concepts and workflows, clinicians need to receive optimal training and the necessary time and resources to carry out the change in patient care logistics.[215]

When working in collaborative teams, allied health care providers need to have a clear understanding of how and why each team member makes decisions about the patient's care.[215] This can be done through IPE, job-specific training, and additional resources, such as the time needed to learn and implement new workflows and collaborations.[213]

Individual-Level Factors for IPP Sustainability

Individual-level factors refer to provider and patient knowledge of, beliefs toward, and experiences with integrated care. Health care providers and patients may have professional and personal beliefs that perpetuate siloed health care delivery.

Provider beliefs and practices toward IPP can improve through continuing education as required by their professional licensure.[212] Sharing newfound knowledge and workflows with colleagues is another way for providers to advocate and promote IPP.[213] Adeniyi and colleagues explored health care providers' perspectives on IPP through qualitative interviews.[212] In these interviews, providers confirmed a lack of knowledge about oral-systemic health links and challenges with support for interprofessional collaboration. The providers expressed a desire for person-centered care and indicated that systems change would be needed for them to be able to adequately provide this type of care. Providers could help advocate for the resources they need in their respective health care organizations to improve person-centered care.

Patient and caregiver beliefs about the care they or their children receive can affect their engagement with the health care system and determine whether they follow through with recommendations for additional care.[211, 213] Community engagement efforts to educate patients and caregivers about interprofessional care practices can help improve acceptance of interprofessional care and referrals.[211, 213] To further improve IPP, providers and patients need to work together to find the best solution or next step in the care continuum that is meaningful to the patient.[215]

Although these system-, organization-, and individual-level factors are presented separately, they are intimately interconnected. Without conducting formal evaluations to understand strengths and weaknesses, it makes it difficult to determine how IPP sustainability can be best supported.[216] Additionally, identifying areas that cane be scaled up throughout the program contributes to program sustainability,

Program Evaluation and Scalability

Program evaluation is a systematic process of determining a program's strengths, weaknesses, and opportunities. Formal evaluation can help identify and standardize best practices in IPP within programs, across organizations, and among industries.[215] Formal evaluation consists of establishing clear objectives and criteria, applying industry norms and values, and drawing conclusions about program strengths, weaknesses, and opportunities as evidenced by outcomes and impacts.[217] Any program or intervention requires clear objectives and expectations of outcomes. Without these two components, it is difficult to know whether what is being done is effective.

Persson Kylén and colleagues proposed an evaluation plan for a person-centered, in-home care IPP.[215] In their plan, they emphasize the need to clearly identify the interprofessional care issue that needs to be addressed. Next, they recommend assessing the barriers to the solution, creating and implementing knowledge interventions, monitoring the

knowledge use, evaluating the outcomes, and sustaining knowledge use. Clearly defined measures and the details surrounding data acquisition, analysis, and dissemination are important parts of the evaluation process and crucial to determining if a program is sustainable.[23, 215]

Ideally, evaluation should occur often to help identify program strengths and barriers and make changes as needed, allowing for quality control and continuous improvement.[23, 215] Identifying barriers allows stakeholders to develop targeted solutions grounded in evidence-based data to overcome the IPP challenges. Areas previously identified for a sustainable IPP program include systems-related factors, organizational factors, and person-centered factors.

Once the components of a successful IPP program have been identified, continuous evaluation helps to understand what is working and what is not. This evaluation allows for adaptability and sustainability, but can also contribute to standardization of best practices, scalability of programs, and continued influence on political and systems change.[218] Important components for scalability include standardizing training protocol and tools, merging health care model logistics, utilizing data for decision-making, funding policy and IPP supports, and including stakeholders in decision-making.[23, 218] In addition to these tools, there are also behaviors and skills that all IPP stakeholders need for the sustainability and scalability of IPP programs. These include confident leadership, effective communication, willingness to adapt, engaging community, thinking evaluatively, and allocating resources.[218]

Important components for scalability include standardizing training protocol and tools, merging health care model logistics, utilizing data for decision-making, funding policy and IPP supports, and including stakeholders in decision-making.

Financing Interprofessional Oral Health Practice

Overview of Funding Mechanisms for Interprofessional Oral Health Practice

Like health care in the US in general, IPP is funded through a variety of public (government-run) and private mechanisms. Health practitioners most often get paid for the services they provide by the health insurance plans of their patients. Insurance companies decide which health services will be paid for through assessment of cost-effectiveness, emerging evidence on care standards, government regulations, and patient needs.[219] The design of coverage mechanisms often informs how practitioners deliver care.[220] For example, if an insurance plan pays for care coordination services, providers are more likely to support provision of these services to their patients.

Furthermore, insurance plans are either publicly administered through the Centers for Medicare and Medicaid Services (CMS) or by a private health insurance company. The latter is often obtained through an individual's employer as group coverage or through the Affordable Care Act marketplace as individual coverage.[221] When considering how insurance coverage financially incentivizes practitioners to work together, it must be recognized that dental practitioners, and by extension most oral health services, are paid by dental plans that are typically separate from the medical plans that cover primary care, behavioral health, medical specialty care, etc. This separation in payment creates a financial disincentive for interprofessional oral health practice.

On the public side, Medicaid provides health coverage for low-income adults, children, pregnant women, elderly adults, and people with disabilities and is administered by each state individually.[222] While some states offer dental coverage as a subsidiary of Medicaid managed care plans, most often dental care is paid for by dental plans, separate from medical coverage.[222] Additionally, Medicare provides health coverage primarily for individuals 65 or older and younger people with disabilities.[223] Generally, Medicare does not cover

dental services, with exceptions for limited services that are inextricably linked to the success of other medical services such as an organ transplant or cancer treatment.[222, 223] This design of public benefits, in which dental services are not covered (Medicare) or each state decides how to cover oral health services (Medicaid), creates barriers to reimbursement for interprofessional oral health practice. Practitioners encounter administrative and financial challenges with separate billing for services, lack of coordination between insurance systems, and lack of financial incentive to provide services collaboratively.

With the increasing realization that oral health is connected to overall health, there is a push to finance interprofessional, comprehensive care.[224–226] Many states have pursued grants to test interprofessional care models and are working on improving oral health within their Medicaid managed care programs.[227, 228] Additionally, over the last decade, CMS has tested alternative payment models (APMs) aimed at improving health outcomes and costs. These models move away from a fee-for-service system, which incentivizes a high volume of service delivery, to a system that rewards quality care that is coordinated and integrated.[229] While these payment models have not generally involved dental practitioners and oral health services, there is an opportunity to build on other models that have done so (discussed below), work to transform current funding mechanisms, and stimulate more widespread interprofessional oral health practice.

With the increasing realization that oral health is connected to overall health, there is a push to finance interprofessional, comprehensive care.

Financial Barriers to Implementation of IPP

The aspiration of practicing interprofessionally is challenged by logistical barriers. Medical and dental health plans often operate independently, with separate provider requirements. Technology systems between the two are also disconnected, hindering the ability to share information between plans and providers. Additionally, while there are federal regulations in place aimed to improve access to oral health services (e.g., the Early and Periodic Screening, Diagnostic, and Treatment (EPSDT) mandate), they are often limited to certain populations. These core issues prevent large-scale funding to incentivize IPP.

As an example of disparate requirements, billing restrictions at FQHCs and rural health clinics often create conflicts between medical and dental plan requirements. While CMS and the Health Resources and Services Administration (HRSA) allow same-day billing for both visits, some states limit reimbursement. For example, California Medicaid permits payment for a medical or behavioral health visit alongside a dental visit, but other states prohibit billing for multiple services, such as dental and behavioral health, on the same day.[230, 231] These restrictions stem from the "per-visit" payment model, which often limits reimbursement to a single encounter per day, potentially discouraging integrated care delivery.

Medicine and dentistry also utilize different coding systems to record, track, and bill for provided services. Medicine uses Current Procedural Terminology (CPT) codes while dentistry uses Current Dental Terminology (CDT) codes. This divide creates "separate languages" between disciplines, making communication about patients, care provided, and opportunities for referral and collaboration difficult. Additionally, unlike medicine, dentistry does not widely use diagnostic codes to classify diseases and conditions, which are known to support accurate billing and insurance claims, standardize information for better health care management and decision-making, and be useful in value-based payment.[232, 233] Lack of reimbursement for existing codes that can promote IPP disincentivizes providers from delivering those services. For example:

- While dental professionals can perform in-office tests for blood glucose and HbA1c levels for patients with signs of uncontrolled diabetes using CDT codes D0412 and D0411,[234] reimbursement varies widely by state and payer, and some dental plans do not cover it at all. In comprehensive care settings, these tests are often performed by the medical side, where reimbursement is more consistent using CPT codes such as 82947. As a result, in settings that do not offer comprehensive care, opportunities for IPP may be missed.

- Historically, no specific CPT codes existed for social drivers of health (SDOH) screenings. In 2024, CMS introduced Healthcare Common Procedure Coding System (HCPCS) code G0136, allowing reimbursement for SDOH screenings every six months per beneficiary, but only for certain services and providers.[204, 235] Dentists still lack reimbursable codes, limiting routine SDOH screenings and creating inconsistent implementation. Additionally, not all payers recognize G0136, and when they do, reimbursement often requires inclusion in a broader evaluation and management service. Administrative burdens, including detailed documentation and visit-time requirements, further deter providers from performing SDOH screenings.

Finally, federal regulations like EPSDT mandate states' Medicaid programs to provide preventive and comprehensive care for enrollees under 21 to ensure access to dental, behavioral health, developmental, and specialty services, aiming to detect and treat conditions early.[236] While this regulation supports IPP for children, no similar mandates exist for adults and seniors, leading to missed opportunities for early oral health interventions in the adult population.

Innovative Financing Strategies

While challenges to interprofessional oral health practice should not be underestimated, emerging financial models provide opportunities for enabling such practice within a fractured health care payment system. CMS's reach in covered lives and available taxpayer funds allows it to be the primary driver of innovative payment models:

- State Medicaid programs are testing pay-for-quality designs, primarily for pediatric populations, in which health plans pay dental providers bonus dollars on top of their regular fee-for-service reimbursements for reaching certain quality measure benchmarks. While most provider-level quality measures focus strictly on increasing access to and utilization of specific preventive dental services (e.g., oral examinations, risk assessment, fluoride, sealants, nutritional counseling), *whole-person care* (i.e., the goal of IPP) is accomplished by holistically preventing infections and supporting systemic health, primarily through access to preventive care.[237–241] Additionally, some states encourage direct IPP in these designs through tracking impact on medical cost related to dental emergencies and give bonus dollars to dental plans for decreasing emergency department (ED) utilization for caries-related reasons.[241, 242]

State Medicaid programs are testing pay-for-quality designs, primarily for pediatric populations, in which health plans pay dental providers bonus dollars on top of their regular fee-for-service reimbursements for reaching certain quality measures.

- State Medicaid programs are also increasingly utilizing ACOs to improve patient care coordination and quality, health outcomes, and total costs of care.[243, 244] While the accountable care model incentivizes health care providers to work together to manage their patients' overall health, very few involve dental care as a part of coordination efforts.[244] Several states, however, have tested incorporation of dental care into approaches to accountable care.[244] In these models, states pay health plans a capitated payment rate for each enrolled member. Subsequently, the health plans pay dental providers a fee for each service they provide, with bonus payments for performance on certain quality measures, such as annual dental visit, proactive patient outreach, risk assessment, and patient satisfaction. While challenges to accountable care, as previously discussed, need to be addressed, these dental-inclusive models have shown success in terms of improved access to dental care; care coordination to address dental, medical, behavioral, and social needs; patient outcomes including reduction in ED utilization for non-traumatic dental conditions; and cost savings to the health care system.
- State Medicaid programs also play a critical role in funding medical providers to deliver oral health services and coordinate care with dental providers. Many states (and even most private payers) reimburse for application of topical fluoride varnish by a non-dental practitioner (CPT code 99188) with children.[245] Some state Medicaid programs — for example, Ohio's — go even further, reimbursing medical providers for oral assessment, oral health education, and dental referrals as necessary along with the application of fluoride varnish.[246] Additionally, recording dental diagnostic codes also allows for oral health documentation specificity and improved information exchange between providers.[245] Beyond fee-for-service, some states, such as New York and California, have operationalized APMs focused on rewarding interprofessional care by paying managed care plans and their contracted medical providers to report on pediatric member access to oral health examinations[247] and for reaching a certain threshold for fluoride varnish application at participating FQHCs.[248]

CMS has also historically offered grant dollars and technical assistance to support innovative oral health care model pilots at the state level.[249] Over the last decade, these state-level demonstration programs generated extensive evidence of the effectiveness of IPP models, primarily for children enrolled in Medicaid. Models included training primary care providers to deliver oral health services and coordinate care with dental providers; dental provider delivery of oral health services in primary care settings, including Women, Infants, and Children

(WIC) clinics; use of community health workers to support family health goals; and pay-for-performance incentives for case management and care coordination.

Other programs, such as the Ryan White HIV/AIDS Oral Health Program, support collaboration between dental and medical providers through initiatives including the Dental Reimbursement Program and Community-Based Dental Partnership Program.[250] These programs require dental providers to coordinate care with medical teams to ensure patients can access medications and support services. Lastly, private grants from foundations are designed to enhance access to oral health services and promote integrated care models. They help drive meaningful collaboration between medical and dental care, supporting community-based health solutions.[251–253] FQHCs and other nonprofit organizations can use this funding to enhance IPP and deliver more coordinated, effective care for their populations. While grants offer short-term funding, states and organizations have maximized these dollars within their unique environments to support IPP to meet the needs of their communities.

Cost-Effectiveness and Return on Investment of IPP

IPP presents a compelling strategy to address both systemic health challenges and financial inefficiencies. In 2019, the economic impact of oral conditions was estimated at $710 billion globally — $387 billion for direct dental expenditures and $323 billion for productivity losses.[254] Additionally, most dental spending (87%) benefits 22% of the world's population.[254] Shifting focus from reactive treatment of oral disease to preventive and coordinated care, IPP models support cost reduction through enhanced early disease detection, intervention, and co-management, with the potential to address health inequities. Health conditions such as diabetes and cardiovascular disease have significant relationships with oral disease, and early detection and intervention can reduce complications and costs that would otherwise burden both patients and health care systems.[22] In medical-dental integration models, long-term cost savings are linked to early detection and coordinated management of oral and systemic health conditions:

- Dental screenings for diabetes, hypertension, and hypercholesterolemia in dental settings could save the US health care system between $42.4 million and $102.6 million annually, depending on referral completion rates.[255]
- Treating periodontal disease among persons with diabetes is also associated with reduced overall costs to the health care system.[136, 256]
- Treating periodontal disease is linked to lower inpatient costs for persons newly diagnosed with heart disease.[257]
- Existing evidence also shows that APMs produce cost savings for the health care system, most notably CMS's Medicare Shared Savings Program, which has rewarded medical ACOs for delivering cost savings and quality primary care for more than a decade.[223] A key driver of the program's success is care integration and the ability of providers to share health information and coordinate care.

APMs provide financial incentives for providers who improve patient outcomes, reduce duplicative procedures, and collaborate across disciplines.[258] There is an opportunity to incorporate oral health into these models to support IPP and additional cost savings.

Technology and innovative workflows are essential to supporting successful and cost-effective IPPs. The use of EHRs and secured messaging platforms across providers allows for seamless care coordination with minimal duplication.[259] Centralized systems support improved documentation, continuing care tracking, and both patient-provider and provider-provider communications. As a result, practices reduce errors, manage risks, and provide more personalized care. These benefits can contribute to improved processes and financial outcomes and enhance the patient experience.

A crucial but often overlooked element of care is the patient experience. Interprofessional models create smoother care pathways and foster a sense of attention and advocacy that is vital for patient satisfaction. When patients experience coordinated communication between their various providers, they are more likely to return for follow-up visits, follow treatment plans, complete referrals, and attend preventive visits.[260] These behaviors can translate into measurable cost efficiencies. As health care shifts toward outcome-based reimbursement models, the ability of IPP to improve both clinical and experiential outcomes positions it as a cost-effective, sustainable strategy for addressing oral and overall health inequities.

While the economic benefits of interprofessional oral health practice are clear, investing financially in elements to improve capacity, access, and coordination (e.g., EHR upgrades, new staffing models, technology for health information exchange) can be costly and may prohibit immediate cost-effectiveness.[261–263] The financial burden of these near-term investments, especially on the health care safety net, must not be underestimated. Careful consideration is required to assess how these investments can result in longer-term economic return at the practice and health-system level.

Barriers to and Facilitators of Oral Health Integration in Medical Settings: A Framework-Based Approach

Efforts to integrate oral health into broader health care systems have gained momentum in recent years, driven by growing recognition of the bidirectional relationship between oral and systemic health. Despite this, implementation of IPP models that support true integration remains limited. To better understand the dynamics that enable or hinder oral health integration within medical settings, it is essential to adopt a structured framework capable of capturing the complexity of these interactions across multiple levels of the health care system.

The Rainbow Model of Integrated Care (RMIC) offers a comprehensive framework for examining the multidimensional nature of care integration. It delineates integration across three interrelated levels: clinical (micro level), professional and organizational (meso level), and systemic (macro level). Each domain addresses specific enablers and constraints, ranging from the nature of interprofessional collaboration at the point of care, to the alignment of organizational cultures and workflows, to policy-level incentives or structural barriers.[264]

Harnagea and colleagues applied the RMIC to examine the integration of oral health services into primary care settings.[211] Their analysis identified distinct barriers and facilitators at each level of the model and offered a useful lens through which to evaluate both existing practices and proposed innovations.[211] Subsequent analyses have drawn upon this work to critique and refine models of care aimed at bridging the divide between dentistry and medicine.[265, 266]

In this section of the white paper, the RMIC framework is used to analyze the barriers and facilitators influencing oral health integration within medical settings. By categorizing insights according to the micro (clinical), meso (professional and organizational), and macro (system-level) domains, this section aims to highlight the interplay of factors that must be addressed to achieve meaningful and sustainable integration. This framework-based approach not only allows for a more nuanced understanding of the challenges involved but also supports the development of targeted strategies to overcome them.

Macro- and meso-level IPP challenges were found by researchers to be the most common barrier to IPP.[267] A 2021 review of IPP by Rawlinson and colleagues revealed that macro-/system-level barriers often included financial concerns and the lack of system-level leadership support for IPP.[267] Meso-/organizational-level barriers were found to include lack of professionals with IPP training/experience, fears about territory and scope lines being blurred, and lack of organizational support. Micro-/clinical-level concerns were primarily identified to be doubts about IPP benefits for patients. The earlier review by Harnagea and colleagues identified barriers as lack of leadership support, financial limitations, lack of human resource infrastructure to support new provider types, lack of providers with IPP training and experience, and lack of technology infrastructure to support IPP.[211] Facilitators, meanwhile, included IPE and supportive policies and leadership.

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Macro/Systems Level

Time and Resources Needed for Systems-Level Integration

Systems-level barriers can include lack of integrated health records, billing code integration, and credentialing of new provider types. In a large health system, the time- and resource-intensive nature of overcoming these system-level challenges can present as a barrier. Larger health systems tend to have more resources (e.g., financial) to invest in these things however, even if it takes more time. Conversely, in smaller practice environments, moving through these challenges requires involvement of fewer people supporting a more efficient change. However, smaller practices may not always have the resources to invest in systems-level changes. For example, in a large health system, something as simple as adjusting the health record platform to accommodate entry of dental record data might take years to accomplish, requiring multiple layers of departmental involvement and approval. While this process may be easier in a smaller practice, they may lack the technical expertise/staff to make such a change. The infrastructure factors for the setting of care provision or the types of models of care delivery used can also create opportunities or barriers; these factors include the potential for colocation, collaborative mobile outreach, and referral connectivity. The more integrated the physical and technological practice is across disciplines, the easier it becomes to allow services to be delivered across professions and in a person-centered way.

Lack of Integrated Health Records

Integration and interoperability of EHRs can be a key facilitator of IPP. A shared EHR system allows for coordination of care and communication between teams using secure technologies to ensure protection of health information and patient privacy. In addition, access to the complete health record allows medicine and dentistry to collaborate more efficiently and to facilitate warm handoffs between departments. It also allows for safer prescribing practices. In 2025, the FDI World Dental Federation (Fédération Dentaire Internationale (FDI)) released a consensus statement, including input from groups such as the ADA, calling for integrated health records and the inclusion of oral health indicators into standard EHRs and broader digital health infrastructures.[268]

As noted by FDI President Dr. Greg Chadwick, "The integration of EHRs can improve diagnoses, treatment coordination, medication management, and patient outcomes, while also strengthening interprofessional collaboration." Meanwhile, the lack of an integrated EHR system is likely to perpetuate the siloed status quo of medicine and dentistry as separate entities, rather than collaborators.

Billing/Reimbursement Challenges

Like the recording of health information, medical and dental billing and reimbursement procedures have also historically been siloed. Since each has its own unique set of billing codes and insurance or benefit providers, integration of these systems can be a complex undertaking. This challenge is intensified by the fact that medical EHR systems are not typically designed for easy integration of dental billing codes or addition of dental benefit providers. Adding dental codes into a medical billing system takes both expertise in dental billing and knowledge of the medical billing system, a skill set few people possess prior to engaging in IPP. In addition to simply adding billing codes, the health care billing system needs to be reconfigured to accommodate the dental billing system, which historically requires only a procedure code rather than both a procedure and diagnosis code, as is the norm in medical billing.

Dental benefits function in very different ways than traditional medical insurance, with much lower maximum benefits, different in-network and out-of-network policies, and different deductible and out-of-pocket costs. Variations in provider enrollment processes across dental payers can lead to confusion and challenges for dental providers, ultimately creating barriers to reimbursement for care. As medical and dental services are covered by different payers, medical and dental benefit payers should form partnerships to maximize reimbursement for interprofessionally delivered care.

Lastly, implementing innovative programs to promote IPP can face strong institutional inertia, with financial constraints being a major barrier. Grants to support pilot programs can overcome this financial barrier, but long-term commitment to learning from the pilot programs and financial sustainability are imperative.

Meso/Organizational Level

Provider Training and Experience with IPP

Lack of educational exposure to IPP is a significant barrier to this type of practice. While the benefits of IPP are increasingly recognized, IPE is still not included in the training of all health care professionals. Providers with formal IPE training are better prepared for IPP.[269] Even if conceptual information about IPP is included in training programs, the practical experience may not be. When health professions students are exposed to IPP through their education and learn about, with, and from other health care providers, they develop an organic understanding and appreciation of other provider types and are better prepared for IPP. When IPE has not been included in their training and they then experience a siloed professional environment, providers may enter the IPP space with an uninformed view of their interprofessional counterparts. Providers without an IPP background may struggle to acclimate to the IPP model, with challenges in communication and cooperative patient care. To overcome these challenges, intentional work is necessary, including education about the model, benefits of IPP, and strategies for success when practicing interprofessionally. Postgraduate learning collaboratives can be an effective means of supporting preparedness for IPP.[23]

Micro/Clinic Level

Workplace Culture Variations

Variations in workplace culture between medical and dental office environments can present a barrier to IPP. While both environments provide health care services to patients, the culture, workflow, team dynamics, size, and expectations differ. For example, in a traditional private practice dental office, there may be just one dentist, a dental assistant, one or two dental hygienists, and an administrative team member. In this context, the team dynamic is typically dentist-centered, with a hierarchical structure in which the dentist is also the employer of the other team members.

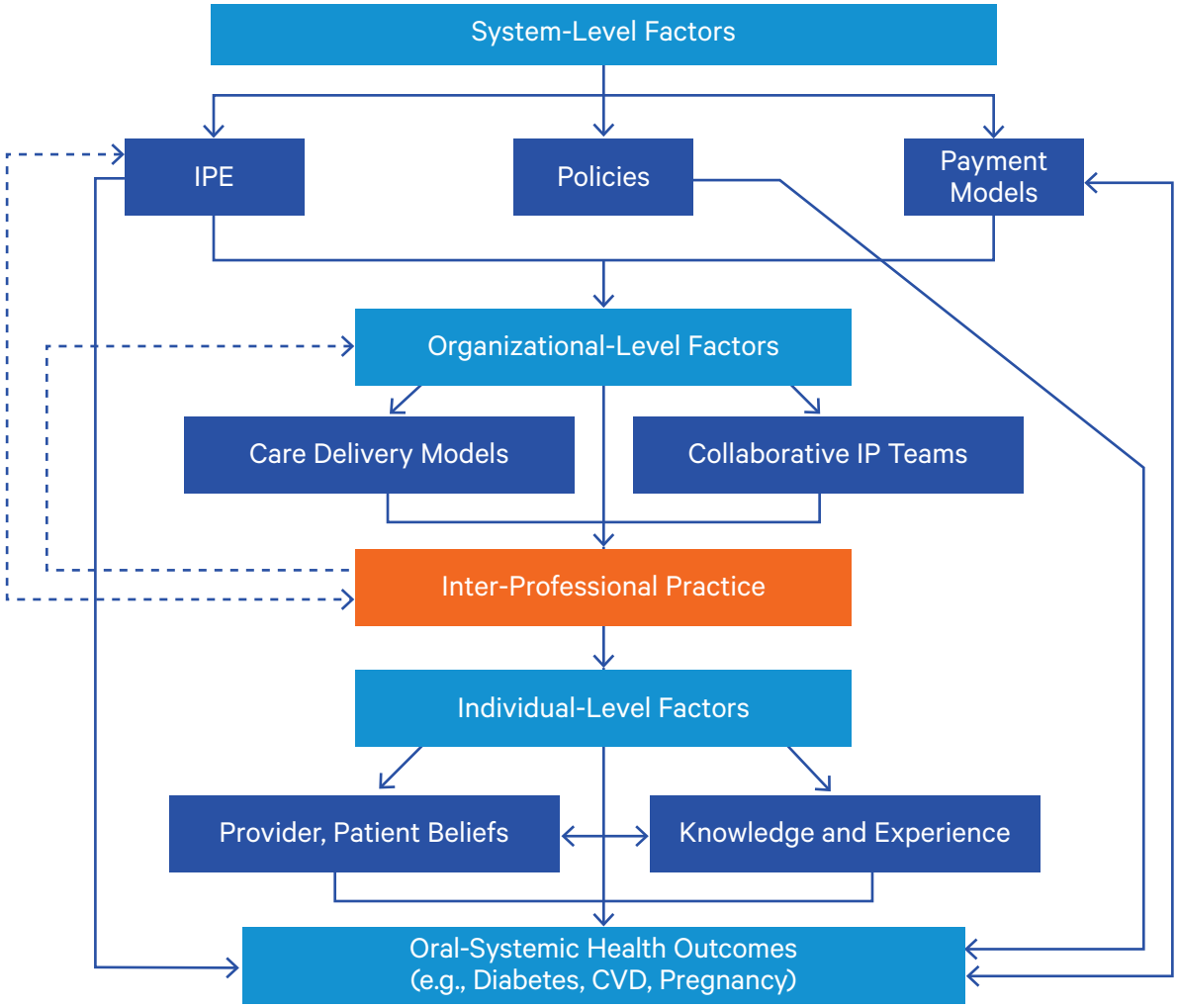
Conversely, in medical offices, which are increasingly part of larger health care systems, the team tends to be much larger, with multiple provider types as well as nurses, nursing assistants, medical assistants, and many administrative team members, including management and patient support representatives. Additionally, in the medical office the doctor is not necessarily at the top of the hierarchy and is less likely to be the employer of the other team members. These cultural differences can present challenges to IPP implementation but can be overcome by adopting an iterative approach to change through using learning cycles, which engages all stakeholders to identify and address barriers.

Another example of variations between medical and dental environments is the clinical workflow. Medical offices are far more accustomed to a workflow that includes multiple team member touchpoints with the patient (e.g., the patient is roomed by the medical assistant, then seen by the provider) working in much shorter, overlapping appointment schedules, whereas the dental hygienist often rooms their own patients and requires a longer patient appointment time with each patient. Initial recognition of these variations, with intentional work toward acclimation of the two environments to accommodate the needs of both medical and dental provider types, is necessary for successful IPP.

Intentional strategies are required to blend the medical and dental environments. Time for modification of workflows, combined training, and evaluation and feedback loops is necessary for best outcomes of IPP. Funding to support this added workload is key to successful integration. When teams have resources to support the upfront investment to ensure a solid IPP working relationship, providers and patients alike will reap the rewards.

Figure 2 provides a conceptual model that summarizes multilevel influences on IPP and oral-systemic outcomes. The solid lines indicate primary, top-down influences — where systems-level and organizational-level factors (e.g., policies, care delivery models, collaborative teams) shape interprofessional practice and ultimately affect individual-level outcomes. Dashed lines represent feedback loops, showing how experiences and outcomes from practice can inform changes in interprofessional education (IPE), policies, organizational processes (e.g., standard operating procedures), and broader systemic structures.

Figure 2. Conceptual Model Illustrating the Multilevel Influences on Interprofessional Practice and Oral-Systemic Health Outcomes



Communication Between Departments/Professions

Breaking out of professional silos requires reliable and accessible methods of communication between departments. Many EHRs facilitate this interprofessional communication by offering secure channels for communication and collaboration, both in formal and informal ways. There may be formal messages between providers that are linked and saved to the patient's chart as a part of their official medical record. Some EHRs offer more informal channels of communication that are not linked to the patient record. By building the communication options directly into the software, routine collaboration and discussion are encouraged. At the administrative level, an integrated EHR allows for coordination of appointments to reduce patient burden of multiple trips to the same location. In addition, the ability to track referrals and follow-ups between departments ensures that patient needs are not overlooked due to lack of follow-up.

Breaking out of professional silos requires reliable and accessible methods of communication between departments.

Future Directions of IPP

As can be seen from the life course approach to interprofessional collaboration between oral health providers and other health professionals, such collaborative practice is critically important to provide comprehensive, whole-person care for individuals across the lifespan. This type of collaboration emphasizes the oral-systemic connection and helps to break down silos in the health care system. As described in this white paper and use cases, progress has been made in integrating oral health care with primary care, behavioral health, nursing, social work, and other professions. That said, less than 10 years ago, Atchison concluded that "the integration of oral health into primary care is in its infancy,"[271] while integration of oral health with other health professions is even less advanced. Work is ongoing to advance interprofessional collaborative practice, and several areas of potential future growth are described below.

Future Directions for IPP Research

To date, much of the research on integrating oral health into IPP has focused on the integration of oral health care with primary care for children and adults. In pediatric practice, programs have emphasized pediatricians providing oral health screenings and referrals, oral health instruction, and topical fluoride applications[272] and the integration of dental hygienists into the primary care setting.[273] Research on the integration of oral health and primary care for adults has shown evidence that integration helps increase screenings for hypertension in the dental office and screenings for gingivitis, fluoride varnish applications, and oral health assessments in primary care.[23, 24] Most IPP research has focused on the integration of oral health care and primary care; more research is needed on the effectiveness of integrating oral health care with nursing, pharmacy, behavioral health, and other health professions regarding outcomes related to oral health, chronic health conditions, and behavioral health conditions.

Within the clinic setting, research can focus on clinical outcomes (e.g., caries incidence, periodontal measurements, blood glucose, and cholesterol levels) as well as patient-reported outcome measures (PROMS)[273] — such as patient satisfaction, quality of life, and overall functioning[274] — communicated through interoperable EHRs. Measures such as the Oral Health Impact Profile assess oral health–related quality of life,[275] while mental health measures such as the Patient Health Questionnaire-9[276] and General Anxiety Disorder-7[277] are used to screen for depression and anxiety, respectively. Interoperable EHRs also allow researchers to compare clinical outcomes and PROMS with adherence to treatment recommendations to design interventions to improve patient adherence and outcomes.

Future research should also examine differences in outcomes (clinical and PROMS) for patients treated within the same health care system between integrated and non-integrated practice settings. For example, a health care system could examine differences in oral and mental health outcomes between patients who present to their oral health providers with depressive symptoms. Patients in colocated clinics might be more likely to follow up with a behavioral health referral after a warm handoff than after receiving a referral to a provider in another location.[278] Research at the health care system level can also compare data on financial outcomes between integrated and non-integrated clinics. Finally, qualitative studies via individual interviews and focus groups can help identify barriers and facilitators to IPP within the same health care system.

At a larger scale, current research into overall health care savings after dental treatment relies on medical and dental claims data.[135, 136] While claims data allows researchers to examine temporal relationships between dental treatment and health care costs, these data lack dental diagnosis codes regarding the severity of dental disease, limiting the conclusions that can be drawn about oral-systemic connections. Data through interoperable EHRs, ideally containing dental diagnosis codes, would provide much more long-term detail about disease severity, progress, referral patterns, and cost of care than can be surmised from claims data. Large-scale data can also examine the effects of policy changes (e.g., Medicaid dental coverage expansion or elimination) on different oral and overall health outcomes.

Advancing IPP Through Stakeholder Engagement and IPP Navigation

Looking ahead, the successful adoption of IPP models will depend on purposeful policy alignment and systems-level implementation strategies. Recent policy changes in Massachusetts show how ACO programs can be leveraged to advance IPP. In 2023, MassHealth, which administers the state's Medicaid and Children's Health Insurance Program (CHIP), implemented a new oral health screening requirement within its ACO program, which means that ACO-participating primary care practices are required to conduct routine oral health screenings, with the objective of identifying individuals who have not accessed dental services in more than a year and connecting them with resources to establish a dental home. The ACO program has already advanced interprofessional behavioral health practice models, which sets a precedent for advancing interprofessional oral health practice models in a similar way.[265]

Akin to the hybrid care models that are utilized in behavioral health, one promising direction involves the use of hybrid care models that leverage the expertise of dental hygienists in primary care clinics, or other nontraditional settings such as schools or long-term care facilities. Such models can provide preventive dental services to patients while also collecting diagnostic data (e.g., radiographs and intraoral clinical photographs) that can be shared with a dentist to allow for remote diagnosis and treatment planning.[279] Hybrid models blend in-person care with virtual care to bring dental services to nontraditional settings and close dental care gaps. However, the implementation of any innovative practice model requires early and sustained stakeholder engagement. A recent multistate analysis revealed that dentists are frequently not considered part of the health care team, and it is only in the recent past that dental hygienists are starting to lend their expertise in nontraditional settings.[29, 272] Therefore, it is necessary to recognize that IPP is still not considered "the norm" and, as a result, without intentional efforts to normalize interprofessional collaboration, new models of dental care delivery that embrace IPP risk remaining isolated innovations rather than scalable solutions.

To avoid this, the role of IPP navigation must be considered, which is a strategic function that supports alignment across payers, health care systems, professional organizations, and site-level management. It is important to create an infrastructure that has clear roles and shared accountability, with mechanisms for continuous learning and growth.

Financing and Funding IPP

There is no one-size-fits-all model for funding interprofessional oral health practice; rather, a plethora of approaches are necessary due to differences in health needs across the lifespan, state policy, health coverage structure, and infrastructure to implement models. To overcome the significant financial and logistical barriers to implementing IPP and fully realizing its benefits, it is crucial to advocate for policy and infrastructure changes that support cost-effective, integrated care. Expanding Medicare to include comprehensive dental services is a critical step toward achieving these goals. Beyond short-term grants, sustainable funding models are needed to ensure long-term support for integrated care. Interprofessional models should address the needs of individuals across the lifespan, building on existing models for children, to achieve cost savings on chronic diseases for adults.

Additionally, CMS should more widely include oral health in its APM testing to promote comprehensive care. It is critical to invest in coding and technology systems to facilitate better communication between providers and promote reimbursement models that incentivize collaborative practices. In May 2025, the "Innovation Center" within CMS announced plans to support the development of partnerships among providers to address disease prevention, including data

transparency between health care providers, although the plans do not address IPP or oral health specifically.[190] Despite challenges in funding IPP, innovative financing strategies and emerging practice models, notably in the public sector, demonstrate improved collaboration, whole-person health outcomes, and cost savings.

The Future of IPP Technology

Interoperable EHRs that allow health care professionals to communicate seamlessly with each other are key to successful IPP. Medical and dental providers alike agree that sharing information about patients with each other is very important, and most health care providers can identify situations in which being able to share information with another health care provider would have improved patient care.[280] The Health Level Seven (HL7) organization proposed a standards framework for health care data exchange called Fast Healthcare Interoperability Resources.[281] FHIR "allows health care information, including clinical and administrative data, to be available securely to those who have a need to access it, and to those who have the right to do so for the benefit of a patient receiving care."[282] HL7 and the American Dental Association provide an implementation guide for bidirectional information exchange between dental and medical providers.[281] More work is needed to fully implement the FHIR standards for dental and medical EHRs, however.

Teledentistry allows for both synchronous (real-time) and asynchronous consultations between oral health providers and other health care professionals.[283] Teledentistry improves access to oral health care for those who are unable to easily access dental care, such as those living in rural and other underserved areas.[284] Artificial intelligence (AI) technology can be used in conjunction with teledentistry to analyze intraoral radiographs and photographs remotely to help diagnose dental caries and periodontal disease.[285] AI can also be used to monitor patients' oral health behaviors remotely through devices such as smart toothbrushes,[286] allowing dental and other health professionals to collaborate with patients on optimal oral health habits. While teledentistry is currently used to facilitate communication between oral health professionals and their patients, future directions may involve interdisciplinary case discussions and treatment planning among providers.

As previously mentioned, AI has a role to play in the future of oral health care and IPP with other health care providers. In addition to being used to help detect dental caries and periodontal disease,[285, 287] AI has the potential to support collaborative decision-making across dental, medical, and other health care providers, although this use of AI is still in its early stages.[288] By facilitating communication across health care teams, AI can streamline sharing treatment plans among health care professionals.[289] AI with natural language processing has the promise of standardizing language used in health records to provide individuals with their own personal health record that they could share across multiple health care providers, facilitating interprofessional collaboration.[290] As AI is in its relative infancy in oral health and other health professions, there are many opportunities for its expanded use in IPP going forward.

Education and Training in IPP of the Future

As IPP continues to grow in use across oral health care and other health care professions, so will the need for educational opportunities to develop and maintain seamless interprofessional teams. Interprofessional Continuing Education (IPCE) programs are jointly accredited by a collaboration of accrediting bodies, including the American Dental Association's Continuing Education Recognition Program (ADA CERP).[291] Continuing IPP education in workplace-based settings can significantly improve providers' attitudes toward interprofessional collaboration and learning and can increase their sense of self-efficacy when it comes to practicing collaboratively.[292] Interprofessional workshops help teams build trust among members by increasing knowledge of each other's roles and allowing team members to highlight their areas of expertise.[293]

In addition to collaborative continuing education programs, health care professionals can also engage in microlearning and on-demand IPP learning modules. Microlearning, or "learning in short, focused bursts designed to meet specific knowledge outcomes,"[294] is more easily incorporated into a busy clinic day than traditional continuing education programs. Similarly, on-demand online resources allow health care providers to learn at their own pace, rather than having to take time away from clinic responsibilities to attend daylong or multiple-day courses. Microlearning and on-demand courses can provide foundational IPP information for health care professionals that may then be built upon in longer, more collaborative continuing education programs.

How to Change a Siloed Culture

Changing the siloed culture of health care, in which providers may focus only on their specialty and assume that other providers will address other issues with their mutual patients, is key to IPP. As more emphasis is placed on the oral-systemic connection and the interaction between oral health and overall health, it becomes more important for health care providers to collaborate with one another to provide their patients with comprehensive, person-centered care. As health care professionals learn more about their own role and others' roles in the health care system, they are better able to understand when and how to engage in collaboration with other health care providers, benefiting their patients and the health care system.

Conclusions

The integration of oral health into whole-person care across the lifespan through IPP represents a crucial advancement in health care systems. The oral-systemic health link is evident and well established throughout all stages of life from prenatal to old age. By breaking down traditional silos between dental and other types of health care, IPP fosters collaboration among a wide range of health professionals, including physicians, nurses, behavioral health providers, and pharmacists, to deliver comprehensive, patient-centered care. IPP can be be implemented in various settings, including schools, long-term care facilities, community-based clinics, and mobile health units. It has been shown that properly planned and implemented IPP models can improve patient outcomes and access to care, enhance chronic disease management, and promote health equity, especially among underserved and marginalized populations.

However, sustainable IPP requires coordinated investment at various levels: systemic, organizational, and individual. At the systems level, challenges such as fragmented financing structures, the separation of dental and medical insurance, and a lack of integrated electronic health records need to be addressed. These could be addressed through supportive policy reform, interoperable technologies, and pay-for-performance models that encourage coordinated, team-based care. At the organizational level, while ensuring providers have the training, time, and resources necessary to implement effective, sustainable models, leadership must commit to infrastructure support, shared care models, and cross-disciplinary workflows. At the individual level, providers and patients benefit from interprofessional education that builds understanding, trust, and communication among professionals.

By breaking down traditional silos between dental and medical care, IPP fosters collaboration among a wide range of health professionals, including physicians, nurses, behavioral health providers, and pharmacists, to deliver comprehensive, patient-centered care.

IPP is not only a way to connect oral health with overall health care; rather, it is a framework for delivering person-centered, life course care. From fluoride application during pediatric well visits to oral screenings during behavioral health visits and in long-term care, IPP could be tailored to diverse clinical and community settings, as demonstrated in this white paper and the accompanying use cases. These models are most effective when supported by strong collaboration, evidence-based design, and meaningful engagement with all stakeholders.

Moving forward, the continued success of IPP will depend on extending research to include a wider range of disciplines, populations, and outcomes; improving policy and reimbursement alignment; and establishing mechanisms for ongoing evaluation and program scalability, as well as changes in the health care culture from silos to integration. This will also require a strong focus on equity to ensure that interprofessional models are inclusive of the needs and priorities of underserved, marginalized groups.

It is the time to move from fragmentation to synergy. By embracing interprofessional oral health practice as a foundation of whole-person care, we can redefine what it means to provide comprehensive, collaborative, and equitable health care for all across the lifespan.

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References

1. "Oral Health in America: Advances and Challenges," 2024, National Institute of Dental and Craniofacial Research, accessed June 22, 2025, https://www.nidcr.nih.gov/sites/default/files/2024-08/oral-health-in-america-advances-and-challenges-full-report.pdf.

2. "Framework for Action on Interprofessional Education and Collaborative Practice," World Health Organization, accessed May 14, 2025, https://iris.who.int/bitstream/handle/10665/70185/?sequence=1.

3. May Nawal Lutfiyya, Linda Feng Chang, Cynthia McGrath, Clark Dana, and Martin S. Lipsky, "The State of the Science of Interprofessional Collaborative Practice: A Scoping Review of the Patient Health-Related Outcomes-Based Literature Published Between 2010 and 2018," *PloS One* 14, no. 6 (June 2019): e0218578. DOI: 10.1371/journal.pone.0218578.

4. CareQuest Institute for Oral Health, *Transforming Oral Health Care Through Interprofessional Education: A Review and Recommendations*, Boston, MA: 2025, https://www.carequest.org/system/files/CareQuest_Institute_IPE-White-Paper_4.1.25_Final.pdf.

5. CareQuest Institute for Oral Health, *Transforming Oral Health Care Through Interprofessional Education: IPE Use Cases*, Boston, MA: 2025, https://www.carequest.org/system/files/CareQuest_Institute_IPE-UseCases_4.1.25_Final.pdf.

6. Antonio Bascones-Martinez, Marta Muñoz-Corcuera, and Jaime Bascones-Ilundain, "Diabetes and Periodontitis: A Bidirectional Relationship," *Medicina Clínica (English Edition)* 145, no. 1 (July 2015): 31–35. DOI: 10.1016/j.medcli.2014.07.019.

7. Raul I. Garcia, Michelle M. Henshaw, and Elizabeth A. Krall, "Relationship Between Periodontal Disease and Systemic Health," *Periodontology 2000* 25 (2001): 21–36. DOI: 10.1034/j.1600-0757.2001.22250103.x.

8. Philip M. Preshaw, Antonio L. Alba, David Herrera, Søren Jepsen, Antonis Konstantinidis, Konstantinos Makrilakis, and Roy Taylor, "Periodontitis and Diabetes: A Two-Way Relationship," *Diabetologia 55*, no. 1 (January 2012): 21–31. DOI: 10.1007/s00125-011-2342-y.

9. Lubaina T. Arsiwala, Yejin Mok, Chao Yang, Junichi Ishigami, Elizabeth Selvin, James D. Beck, Matthew A. Allison, Gerardo Heiss, Ryan T. Demmer, and Kunihiro Matsushita, "Periodontal Disease Measures and Risk of Incident Peripheral Artery Disease: The Atherosclerosis Risk in Communities (ARIC) Study," *Journal of Periodontology* 93, no. 7 (July 2022): 943–953. DOI: 10.1002/JPER.21-0342.

10. Soo Hwan Byun, Sunki Lee, Sung Hun Kang, Hyo Geun Choi, and Seok Jin Hong, "Cross-Sectional Analysis of the Association Between Periodontitis and Cardiovascular Disease Using the Korean Genome and Epidemiology Study Data," *International Journal of Environmental Research and Public Health* 17, no. 14 (July 2020): 5237. DOI: 10.3390/ijerph17145237.

11. Steve Kisely, Emily Sawyer, Dan Siskind, and Ratilal Lalloo, "The Oral Health of People with Anxiety and Depressive Disorders — A Systematic Review and Meta-Analysis," *Journal of Affective Disorders*, 200 (August 2016): 119–132. DOI: 10.1016/j.jad.2016.04.040.

12. Tamanna Tiwari, Abigail Kelly, Cameron L. Randall, Eric Tranby, and Julie Franstve-Hawley, "Association Between Mental Health and Oral Health Status and Care Utilization," *Frontiers in Oral Health* 2 (February 2022): 732882. DOI: 10.3389/froh.2021.732882.

13. Anne L. Hague, "Eating Disorders: Screening in the Dental Office," *Journal of the American Dental Association* 141, no. 6 (June 2010): 675–678. DOI: 10.14219/jada.archive.2010.0257.

14. Rachel Presskreischer, Michael A. Prado, S. Emre Kuraner, Isabelle-Maria Arusilor, and Kathleen Pike, "Eating Disorders and Oral Health: A Scoping Review," *Journal of Eating Disorders* 11, no. 1 (April 2023): 55. DOI: 10.1186/s40337-023-00778-z.

15. Lauren Crowder, "Is There Evidence of a Relationship Between Pre-Eclampsia and Periodontitis?" *Evidence-Based Dentistry* 24, no. 1 (March 2023): 37–38. DOI: 10.1038/s41432-023-00870-y.

16. Quynh-Anh Le, Rahena Akhter, Kimberly Mathieu Coulton, Ngoc Truong Nhu Vo, Le Thi Yen Duong, Hoang Viet Nong, Albert Yaacoub, George Condous, Joerg Eberhard, and Ralph Nanan, "Periodontitis and Preeclampsia in Pregnancy: A Systematic Review and Meta-Analysis," *Maternal and Child Health Journal* 26, no. 12 (December 2022): 2419–2443. DOI: 10.1007/s10995-022-03556-6.

17. Edwar J. Manrique-Corredor, Domingo Orozco-Beltran, Adriana Lopez-Pineda, Jose A. Quesada, Vicente F. Gil-Guillen, and Concepcion Carratala-Munuera, "Maternal Periodontitis and Preterm Birth: Systematic Review and Meta-Analysis," *Community Dentistry and Oral Epidemiology* 47, no. 3 (June 2019): 243–251. DOI: 10.1111/cdoe.12450.

18. Tania Padilla-Cáceres, Heber Isac Arbildo-Vega, Luz Caballero-Apaza, Fredy Cruzado-Oliva, Vilma Mamani-Cori, Sheyla Cervantes-Alagón, Evelyn Munayco-Pantoja, Saurav Panda, Hernán Vásquez-Rodrigo, Percy Castro-Mejía, and Delsi Huata-Acha, "Association Between the Risk of Preterm Birth and Low Birth Weight with Periodontal Disease in Pregnant Women: An Umbrella Review," *Dentistry Journal* 11, no. 3 (March 2023): 74. DOI: 10.3390/dj11030074.

19. Peace Uwambaye, Cyprien Munyanshongore, Stephen Rulisa, Harlan Shiau, Assuman Nuhu, and Michael S. Kerr, "Assessing the Association Between Periodontitis and Premature Birth: A Case-Control Study," *BMC Pregnancy and Childbirth* 21, no. 1 (March 2021): 204. DOI: 10.1186/s12884-021-03700-0.

20. Chia-Yen Lee, Chuen-Chau Chang, Chao-Shun Lin, Chun-Chieh Yeh, Chaur-Jong Hu, Ching-Zong Wu, Ta-Liang Chen, and Chien-Chang Liao, "Risk of Dementia in Patients with Periodontitis and Related Protective Factors: A Nationwide Retrospective Cohort Study," *Journal of Clinical Periodontology* 47, no. 12 (December 2020): 1428–1436. DOI: 10.1111/jcpe.13372.

21. Yao-Tung Lee, Hsin-Chien Lee, Chaur-Jongh Hu, Li-Kai Huang, Shu-Ping Chao, Chia-Pei Lin, Emily Chia-Yu Su, Yi-Chen Lee, and Chu-Chieh Chen, "Periodontitis as a Modifiable Risk Factor for Dementia: A Nationwide Population-Based Cohort Study," *Journal of the American Geriatrics Society* 65, no. 2 (February 2017): 301–305. DOI: 10.1111/jgs.14449.

22. Lisa J. Heaton, Tamanna Tiwari, and Eric P. Tranby, *Oral-Systemic Interactions and Medical-Dental Integration: A Life Course Approach*, Boston, MA, September 2023. DOI: 10.35565/CQI.2023.2010.

23. Kaitlyn Cardenas, Taylor Weilnau, Crystal Aguilar, Amal Ali, Alec Eidelman, Sridevi Ponnala, Tiffany Russel, James Schwanderla, Karlynn Sievers, Hongsheng Wu, Hugh Silk, Lindsday Swain Hunt, Jane Barrow, Christine A. Riedy, and Russell S. Phillips, "Partnering for Integrated Care: A Learning Collaborative for Primary Care and Oral Health Teams," *Annals of Family Medicine* 21, Suppl 2 (February 2023): S22–S30. DOI: 10.1370/afm.2918.

24. Christine Kanan, Kelli Ohrenberger, Mary Bayham, Sarah E. Raskin, Eric P. Tranby, and Sean Boynes, "MORE Care: An Evaluation of an Interprofessional Oral Health Quality Improvement Initiative," *Journal of Public Health Dentistry* 80, Suppl 2 (September 2020): S58–S70. DOI: 10.1111/jphd.12407.

25. "School-Based Model," Rural Health Information Hub, accessed May 18, 2025, https://www.ruralhealthinfo.org/toolkits/oral-health/2/school-based-model.

26. Nelly Villacorta-Siegal, Karen Joseph, Sandra Gardner, Jagger Smith, Christina E. Gallucci, Rosanne Aleong, and David Chvartszaid, "Integration of a Dental Hygienist into the Interprofessional Long-Term Care Team," *Gerodontology* 41, no. 1 (March 2024): 125–140. DOI: 10.1111/ger.12734.

27. Michael Paul McShane, Andrew Zechman, Ryan McNally, and Mark Stephens, "Mobile Health Clinic: Lessons Learned Building Partnerships Across Health Systems," *The American Journal of Accountable Care* 11, no. 1 (2023): 38–41. DOI: 10.37765/ajac.2023.89342.

28. Commonwealth Fund, "In Focus: Integrating Oral Health into Primary Care," accessed May 29, 2025, https://www.commonwealthfund.org/publications/newsletter-article/2015/feb/focus-integrating-oral-health-primary-care.

29. John Ahern, Sara Singer, Aditi Bhanja, Jane Barrow, and Michaela Kerrissey, "Considering Dentists Within the Healthcare Team: A Cross-Sectional, Multi-State Analysis of Primary Care Provider and Staff Perspectives," *Journal of General Internal Medicine* 37, no. 1 (January 2022): 246–248. DOI: 10.1007/s11606-020-06564-w.

30. Poul Erik Petersen and Tatsuo Yamamoto, "Improving the Oral Health of Older People: The Approach of the WHO Global Oral Health Programme," *Community Dentistry and Oral Epidemiology* 33, no. 2 (April 2005): 81–92. DOI: 10.1111/j.1600-0528.2004.00219.x.

31. Hugh Barr, "Interprofessional Education: The Genesis of a Global Movement," The Centre for the Advancement of Interprofessional Education, accessed May 14, 2025, https://www.caipe.org/resources/publications/barr-h-2015-interprofessional-education-genesis-global-movement.

32. Saman Warnakulasuriya, "Global Epidemiology of Oral and Oropharyngeal Cancer," *Oral Oncology* 45, no. 4–5 (April-May 2009): 309–316. DOI: 10.1016/j.oraloncology.2008.06.002.

33. India Cannon, Anna Robinson-Barella, Gillian McLellan, and Sheena E. Ramsay, "From Drugs to Dry Mouth: A Systematic Review Exploring Oral and Psychological Health Conditions Associated with Dry Mouth in Older Adults with Polypharmacy," *Drugs & Aging* 40, no. 4 (April 2023): 307–316. DOI: 10.1007/s40266-023-01017-5.

34. Barry Patton, Orla McPhillips, and Richeal Ní Ríordáin, "The Impact of Systemic Conditions and Polypharmacy on Older Patients' Oral Health and Dental Treatment," *Journal of the Irish Dental Association* 68, no. 5 (October 2022): 257–261. DOI: 10.58541/001c.71290.

35. Yvonne L. Kapila, "Oral Health's Inextricable Connection to Systemic Health: Special Populations Bring to Bear Multimodal Relationships and Factors Connecting Periodontal Disease to Systemic Diseases and Conditions," *Periodontology* 2000 87, no. 1 (October 2021): 11–16. DOI: 10.1111/prd.12398.

36. Robert Eves, Marina Mendonça, Nicole Baumann, Yanyan Ni, Brian A. Darlow, John Horwood, Lianne J. Woodward, Lex W. Doyle, Jeanie Cheong, Peter J. Anderson, Peter Bartmann, Neil Marlow, Samantha Johnson, Eero Kajantie, Petteri Hovi, Chiara Nosarti, Marit S. Indredavik, Kari-Anne I. Evensen, Katri Räikkönen, Kati Heinonen, Jennifer Zeitlin, and Deiter Wolke, "Association of Very Preterm Birth or Very Low Birth Weight with Intelligence in Adulthood: An Individual Participant Data Meta-Analysis," *JAMA Pediatrics* 175, no. 8 (August 2021): e211058.

37. Iwona Jańczewska, Jolanta Wierzba, Alicja Jańczewska, Małgorzata Szczurek-Gierczak, and Iwona Domżalska-Popadiuk, "Prematurity and Low Birth Weight and Their Impact on Childhood Growth Patterns and the Risk of Long-Term Cardiovascular Sequelae," *Children* 10, no. 10 (September 2023): 1599. DOI: 10.3390/children10101599.

38. Katy Battani, Emily Norrix, Lindsay Sailor, and Christine Farrell, "Improving Access to Oral Health Care: Integrating Dental Hygienists into Federally Qualified Health Center Obstetrics and Gynecology Clinics in Michigan," *Journal of Dental Hygiene* 97, no. 3 (June 2023): 7–12.

39. Jeffrey T. Jackson, Rocio B. Quinonez, Amanda K. Kerns, Alice Chuang, R. Scott Eidson, Kim A. Boggess, and Jane A. Weintraub, "Implementing a Prenatal Oral Health Program Through Interprofessional Collaboration," *Journal of Dental Education* 79, no. 3 (March 2015): 241–248. DOI: 10.1002/j.0022-0337.2015.79.3.tb05878.x.

40. Wenche Sylling Borgnakke and Prakash Poudel, "Diabetes and Oral Health: Summary of Current Scientific Evidence for Why Transdisciplinary Collaboration Is Needed," *Frontiers in Dental Medicine* 2 (July 2021): 709831. DOI: 10.3389/fdmed.2021.709831.

41. David S. Gesko, William A. Rush, and Emily Utoft Durand, "The Oral-Systemic Link: An Opportunity for Collaboration," *Diabetes Spectrum* 24, no. 4 (2011): 187–189. DOI: 10.2337/diaspect.24.4.187.

42. Paula Sanchez, Bronwyn Everett, Yenna Salamonson, Shilpi Ajwani, Sameer Bhole, Joshua Bishop, Karen Lintern, Samantha Nolan, Rohan Rajaratnam, Julie Redfern, Maria Sheehan, Fiona Skarligos, Lissa Spencer, Ravi Srinivas, and Ajesh George, "Oral Health and Cardiovascular Care: Perceptions of People with Cardiovascular Disease," *PLoS One* 12, no. 7 (July 2017): e0181189. DOI: 10.1371/journal.pone.0181189.

43. Paula Sanchez, Bronwyn Everett, Yenna Salamonson, Shilpi Ajwani, and Ajesh George, "Oral Healthcare and Cardiovascular Disease: A Scoping Review of Current Strategies and Implications for Nurses," *Journal of Cardiovascular Nursing* 32, no. 3 (May–June 2017): E10-E20. DOI: 10.1097/JCN.0000000000000388.

44. David H. Adamowicz and Ellen E. Lee, "Predicting and Improving Hospital Outcomes for Older Adults," *International Psychogeriatrics* 33, no. 3 (March 2021): 205–207. DOI: 10.1017/S1041610220003580.

45. Victoria C. Ewan, Andrew D. Sails, Angus W. G. Walls, Steven Rushton, and Julia L. Newton, "Dental and Microbiological Risk Factors for Hospital-Acquired Pneumonia in Non-Ventilated Older Patients," *PLoS One* 10, no. 4 (April 2015): e0123622. DOI: 10.1371/journal.pone.0123622.

46. "Medicare Statistics and Facts in 2025," Forbes Advisor, accessed April 24, 2025, https://www.forbes.com/advisor/health-insurance/medicare/medicare-statistics/.

47. Amber Willink, Cathy Schoen, and Karen Davis, "Dental Care and Medicare Beneficiaries: Access Gaps, Cost Burdens, and Policy Options," *Health Affairs* 35, no. 12 (December 2016): 2241–2248. DOI: 10.1377/hlthaff.2016.0829.

48. Judith Haber, Erin Hartnett, Kenneth Allen, Ruth Crowe, Jennifer Adams, Abigail Bella, Thomas Riles, and Anna Vasilyeva, "The Impact of Oral-Systemic Health on Advancing Interprofessional Education Outcomes," *Journal of Dental Education* 81, no. 2 (February 2017): 140–148.

49. Sean G. Boynes, David M. Krol, and Mark Deutchman, "Shared Approach to Oral-Systemic Health," *Decisions in Dentistry* 7, no. 11 (November 2025): 32–35.

50. Allauddin Siddiqi, Sobia Zafar, Ajay Sharma, and Alessandro Quaranta, "Diabetes Mellitus and Periodontal Disease: The Call for Interprofessional Education and Interprofessional Collaborative Care—A Systematic Review of the Literature," *Journal of Interprofessional Care* 36, no. 1 (December 2022): 93–101. DOI: 10.1080/13561820.2020.1825354.

51. "Older Adults and Oral Health: A Continuing Challenge," Association of State and Territorial Dental Directors, accessed May 14, 2025, https://www.astdd.org/docs/older-adults-and-oral-health-a-continuing-challenge.pdf.

52. Jason Tasoulas, Douglas R. Farquhar, Siddharth Sheth, Trevor Hackman, Wendell G. Yarbrough, Chris B. Agala, Alzina Koric, Luca Giraldi, Eleonora Fabianova, Jolanta Lissowska, Beata Świątkowska, Marta Vilensky, Victor Wünsch-Filho, Marcos Brasilino de Carvalho, Rossana Verónica Mendoza López, Ivana Holcátová, Diego Serraino, Jerry Polesel, Cristina Canova, Lorenzo Richiardi, Jose P. Zevallos, Andy Ness, Miranda Pring, Steve J. Thomas, Tom Dudding, Yuan-Chin Amy Lee, Mia Hashibe, Paolo Boffetta, Andrew F. Olshan, Kimon Divaris, and Antonio L. Amelio, "Poor Oral Health Influences Head and Neck Cancer Patient Survival: An International Head and Neck Cancer Epidemiology Consortium Pooled Analysis," *Journal of the National Cancer Institute* 116, no. 1 (January 2024): 105–114. DOI: 10.1093/jnci/djad156.

53. "MORE Care (Medical Oral Expanded Care)," CareQuest Institute for Oral Health, accessed May 30, 2025, https://www.carequest.org/how-we-work/health-improvement-programs/more-care.

54. Patricia A. Braun, Cherith Flowerday, Andrew Bienstock, Tara Callaghan, K. Freeman, Michelle Gable, Lorraine Ramirez, and Linda M. Dickinson, "Delivery of Oral Health Services at Medical Visits Through 3 Medical Dental Integration Models," *JDR Clinical & Translational Research* 9, no. 1_suppl (October 2024): 32S-40S. DOI: 10.1177/23800844241273771.

55. Paul Glassman, Maureen Harrington, Maysa Namakian, and Paul Subar, "The Virtual Dental Home: Bringing Oral Health to Vulnerable and Underserved Populations," *Journal of the California Dental Association* 40, no. 7 (July 2012): 569–577.

56. Robert J. Genco, Robert E. Schifferle, Robert G. Dunford, Karen L. Falkner, William C. Hsu, and James Balukjian, "Screening for Diabetes Mellitus in Dental Practices: A Field Trial," *The Journal of the American Dental Association* 145, no. 1 (January 2014): 57–64. DOI: 10.14219/jada.2013.7.

57. Sevek Engström, Christian Berne, Lars Gahnberg, and Kurt Svärdsudd, "Efficacy of Screening for High Blood Pressure in Dental Health Care," *BMC Public Health* 11 (2011): 1–7. DOI: 10.1186/1471-2458-11-194.

58. Gloria C. Bales, Eric G. R. Kim, Shelley Curtan, David Selvaraj, Christine A. Riedy, Gregory P. Heintschel, R. Douglas Bruce, Jeffrey M. Albert, David C. Kaelber, and Suchitra Nelson, "System-Based Intervention for Medical Providers to Improve Dental Attendance in Adult Primary Care," *JDR Clinical & Translational Research* 9, no. 1_suppl (October 2024): 50S–58S. DOI: 10.1177/23800844241273758.

59. Masahiro Ryu, Takayuki Ueda, and Kaoru Sakurai, "An Interprofessional Approach to Oral Hygiene for Elderly Inpatients and the Perception of Caregivers Towards Oral Health Care," *International Dental Journal* 71, no. 4 (August 2021): 328–335. DOI: 10.1016/j.identj.2020.12.003.

60. Commission on Dental Accreditation, *Accreditation Standards for Dental Education Programs*, Chicago, IL: 2023, https://coda.ada.org/-/media/project/ada-organization/ada/coda/files/predoc_standards.pdf.

61. Commission on Dental Accreditation, *Accreditation Standards for Dental Hygiene Education Programs*, Chicago, IL: 2023, https://coda.ada.org/-/media/project/ada-organization/ada/coda/files/dental_hygiene_standards.pdf.

62. Interprofessional Education Collaborative, *IPEC Core Competencies for Interprofessional Collaborative Practice: Version 3*, Washington, DC: 2023. https://ipec.memberclicks.net/assets/core-competencies/IPEC_Core_Competencies_Version_3_2023.pdf.

63. "ADEA Policy Brief: Interprofessional Education and Collaborative Care," American Dental Education Association, accessed June 23, 2025, https://www.adea.org/docs/default-source/uploadedfiles/uploadedfiles/adea/content-conversion/policy-advocacy/white-papers/adea-policybrief-interprofessionaledu-final.pdf.

64. Laura Bernardi, Johannes Huinink, and Richard A. Settersten Jr., "The Life Course Cube: A Tool for Studying Lives," *Advances in Life Course Research* 41 (September 2019): 100258. DOI: 10.1016/j.alcr.2018.11.004.

65. Glen H. Elder, Jr., "Time, Human Agency, and Social Change: Perspectives on the Life Course," *Social Psychology Quarterly* 57, no. 1 (March 1994): 4–15.

66. Heidi Ann Hanson, Claire Louise Leiser, Gretchen Bandoli, Brad Howard Pollock, Margaret Rose Karagas, Daniel Armstrong, Ann Dozier, Nicole G. Weiskopf, Maureen Monaghan, Ann M. Davis, Elizabeth Eckstrom, Chunhua Weng, Jonathan N. Tobin, Frederick Kaskel, Mark R. Schleiss, Peter Szilagyi, Carrie Dykes, Dan Cooper, and Shari L. Barkin, "Charting the Life Course: Emerging Opportunities to Advance Scientific Approaches Using Life Course Research," *Journal of Clinical and Translational Science* 5, no. 1 (2021): e9.

67. Maynard V. Olson, "The Human Genome Project," *Proceedings of the National Academy of Sciences* 90, no. 10 (May 1993): 4338–4344. DOI: 10.1073/pnas.90.10.4338.

68. Laura Di Renzo, Paola Gualtieri, Giulia Frank, Rossella Cianci, Mario Caldarelli, Giulia Leggeri, Glauco Raffaelli, Erica Pizzocaro, Michela Cirillo, and Antonino De Lorenzo, "Exploring the Exposome Spectrum: Unveiling Endogenous and Exogenous Factors in Non-Communicable Chronic Diseases," *Diseases* 12, no. 8 (August 2024): 176. DOI: 10.3390/diseases12080176.

69. Clemens Scott Kruse, Rishi Goswamy, Yesha Jayendrakumar Raval, and Sarah Marawi, "Challenges and Opportunities of Big Data in Health Care: A Systematic Review," *JMIR Medical Informatics* 4, no. 4 (November 2016): e38. DOI: 10.2196/medinform.5359.

70. Rahul C. Deo, "Machine Learning in Medicine," *Circulation* 132, no. 20 (November 2015): 1920–1930. DOI: 10.1161/CIRCULATIONAHA.115.001593.

71. Stylianos Serghiou and Kathryn Rough, "Deep Learning for Epidemiologists: An Introduction to Neural Networks," *American Journal of Epidemiology* 192, no. 11 (November 2023): 1904–1916. DOI: 10.1093/aje/kwad107.

72. Dan B. Henry, "The Consequences of Restorative Cycles," *Operative Dentistry* 34, no. 6 (November-December 2009): 759–760. DOI: 10.2341/09-OP1.

73. Takafumi Yamamoto, Upul Cooray, Takumi Kusama, Sakura Kiuchi, Hazem Abbas, Keiko Osaka, Katsunori Kondo, and Jun Aida, "Childhood Socioeconomic Status Affects Dental Pain in Later Life," *JDR Clinical & Translational Research* 10, no. 2 (September 2024): 135–145. DOI: 10.1177/23800844241271740.

74. Daniel Nono, George Bagenda, Isaac Okullo, and Charles Mugisha Rwenyonyi, "Exploring Lived Experiences with Tooth Loss among Fully Edentulous Patients Attending Makerere University Dental Hospital, Kampala, Uganda," *BMC Oral Health* 24, no. 1 (November 2024): 1355. DOI: 10.1186/s12903-024-05150-4.

75. Aspasia Pachiou, Panagiotis Roulias, Paschalis Steiropoulos, Demetrios J. Halazonetis, and Stefanos Kourtis, "Association of Edentulism and Obstructive Sleep Apnea: A Systematic Review," *Journal of Prosthodontics* 34, suppl. 1 (April 2025): 90–99. DOI: 10.1111/jopr.13981.

76. Richard J. Manski, John Moeller, Jody Schimmel, Patricia A. St. Clair, Haiyan Chen, Larry Magder, and John V. Pepper, "Dental Care Coverage and Retirement," *Journal of Public Health Dentistry* 70, no. 1 (2010): 1–12. DOI: 0.1111/j.1752-7325.2009.00137.x.

77. Richard Miech, Lloyd Johnston, Patrick M. O'Malley, Katherine M. Keyes, and Kennon Heard, "Prescription Opioids in Adolescence and Future Opioid Misuse," *Pediatrics* 136, no. 5 (November 2015): e1169–e1177. DOI: 10.1542/peds.2015-1364.

78. Shannon Gwin Mitchell, Anjali R. Truitt, Lauryn M. Davin, and D. Brad Rindal, "Pain Management after Third Molar Extractions in Adolescents: A Qualitative Study," *BMC Pediatrics* 22, no. 1 (April 2022): 184. DOI: 0.1186/s12887-022-03261-x.

79. Arthur J. Nowak and Paul S. Casamassimo, "The Dental Home: A Primary Care Oral Health Concept," *Journal of the American Dental Association* 133, no. 1 (January 2002): 93–98. DOI: 10.14219/jada.archive.2002.0027.

80. Bruce A. Dye, "The Global Burden of Oral Disease: Research and Public Health Significance," *Journal of Dental Research* 96, no. 4 (2017): 361–363. DOI: 10.1177/0022034517693567.

81. Francisco J. Ramos-Gomez, Yasmi O. Crystal, Man Wai Ng, James J. Crall, and John D. B. Featherstone, "Pediatric Dental Care: Prevention and Management Protocols by Caries Risk Assessment," *Journal of the California Dental Association* 38, no. 10 (October 2010): 746–761.

82. Susan A. Fisher-Owens, Stuart A. Gansky, Larry J. Platt, Jane A. Weintraub, Mah-J Soobader, Matthew D. Bramlett, and Paul W. Newacheck, "Influences on Children's Oral Health: A Conceptual Model," *Pediatrics* 120, no. 3 (September 2007): e510–e520. DOI: 10.1542/peds.2006-3084.

83. Kavita R. Mathu-Muju, Jay W. Friedman, and David A. Nash, "Oral Health Care for Children in Countries Using Dental Therapists in Public, School-Based Programs, Contrasted with That of the United States, Using Dentists in a Private Practice Model," *American Journal of Public Health* 103, no. 9 (September 2013): e7–e13. DOI: 10.2105/AJPH.2013.301251.

84. Francisco J. Ramos-Gomez, "A Model for Community-Based Pediatric Oral Health: Implementation of an Infant Oral Care Program," *International Journal of Dentistry* 2014 (January 2014): 156821. DOI: 10.1155/2014/156821.

85. American Academy of Pediatric Dentistry, "Policy on the Dental Home," *The Reference Manual of Pediatric Dentistry*. Chicago, Ill.: American Academy of Pediatric Dentistry; 2024:38–40.

86. Matthew F. Savage, Jessica Y. Lee, Jonathan B. Kotch, and William F. Vann Jr., "Early Preventive Dental Visits: Effects on Subsequent Utilization and Costs," *Pediatrics* 114, no. 4 (October 2004): e418–e423. DOI: 10.1542/peds.2003-0469-F.

87. Ashley M. Kranz, Isaac M. Opper, Bradley D. Stein, Teague Ruder, Grace Gahlon, and Mark Sorbero, "Medicaid Payment and Fluoride Varnish Application During Pediatric Medical Visits," *Medical Care Research and Review* 79, no. 6 (December 2022): 834–843. DOI: 10.1177/10775587221074766.

88. "Head Start Approach," HeadStart.gov, accessed May 13, 2025, https://www.headstart.gov/programs/article/head-start-approach.

89. Apple Tree Dental, "Apple Tree Dental," accessed May 13, 2025, https://appletreedental.org/.

90. "Eruption Charts," MouthHealthy, American Dental Association, accessed April 28, 2025, https://www.mouthhealthy.org/all-topics-a-z/eruption-charts.

91. Phoebe Pui Ying Lam, Helene Chua, Manikandan Ekambaram, Edward Chin Man Lo, and Cynthia Kar Yung Yiu, "Does Early Childhood Caries Increase Caries Development Among School Children and Adolescents? A Systematic Review and Meta-Analysis," *International Journal of Environmental Research and Public Health* 19, no. 20 (October 2022): 13459. DOI: 10.3390/ijerph192013459.

92. Pallavi Pujar and V. V. Subbareddy, "Evaluation of the Tooth Brushing Skills in Children Aged 6–12 Years," *European Archives of Paediatric Dentistry* 14, no. 4 (August 2013): 213-219. DOI: 10.1007/s40368-013-0046-3.

93. Anna Sandström, Janet Cressey, and Christina Stecksén-Blicks, "Tooth-Brushing Behaviour in 6–12 Year Olds," *International Journal of Paediatric Dentistry* 21, no. 1 (January 2011): 43–49. DOI: 10.1111/j.1365-263X.2010.01080.x.

94. Gina Thornton-Evans, Michele L. Junger, Mei Lin, Liang Wei, Lorena Espinoza, and Eugenio Beltran-Aguilar, "Use of Toothpaste and Toothbrushing Patterns among Children and Adolescents — United States, 2013–2016," *MMWR. Morbidity and Mortality Weekly Report* 68, no. 4 (February 2019): 87–90. DOI: 10.15585/mmwr.mm6804a3.

95. Anneli Ahovuo-Saloranta, Helena Forss, Tanya Walsh, Anne Nordblad, Marjukka Mäkelä, and Helen V. Worthington, "Pit and Fissure Sealants for Preventing Dental Decay in Permanent Teeth," *Cochrane Database of Systematic Reviews* 7, no. 7 (July 2017): CD001830. DOI: 10.1002/14651858.CD001830.pub5.

96. Valeria C. C. Marinho, Helen V. Worthington, Tanya Walsh, and Jan E. Clarkson, "Fluoride Varnishes for Preventing Dental Caries in Children and Adolescents," *Cochrane Database of Systematic Reviews* 2013, no. 7 (July 2013). DOI: 10.1002/14651858.CD002279.

97. Wafa Kashbour, Puneet Gupta, Helen V. Worthington, and Dwayne Boyers, "Pit and Fissure Sealants Versus Fluoride Varnishes for Preventing Dental Decay in the Permanent Teeth of Children and Adolescents," *Cochrane Database of Systematic Reviews* 11, no. 11 (November 2020): CD003067. DOI: 10.1002/14651858.CD003067.pub5.

98. "AAO Economics of Orthodontics Survey Report: Patient Data Similar to Pre-COVID Reports; Growth in DSO/OSO Employment," American Association of Orthodontists, accessed April 28, 2025, https://www2.aaoinfo.org/aao-economic-survey-report-patient-data-similar-to-pre-covid-reports-continued-growth-in-dso-oso-employment/.

99. Luminita Lazar, Alexandru Vlasa, Liana Beresescu, Anamaria Bud, Ana Petra Lazar, Larisa Matei, and Eugen Bud, "White Spot Lesions (WSLs)—Post-Orthodontic Occurrence, Management and Treatment Alternatives: A Narrative Review," *Journal of Clinical Medicine* 12, no. 5 (February 2023): 1908. DOI: 10.3390/jcm12051908.

100. Kristina Lopatiene, Marija Borisovaite, and Egle Lapenaite, "Prevention and Treatment of White Spot Lesions During and after Treatment with Fixed Orthodontic Appliances: A Systematic Literature Review," *Journal of Oral & Maxillofacial Research* 7, no. 2 (June 2016): e1. DOI: 10.5037/jomr.2016.7201.

101. Shailaja Raghavan, Elham S. Abu Alhaija, Mandeep Singh Duggal, Srinivasan Narasimhan, and Sadeq Ali Al-Maweri, "White Spot Lesions, Plaque Accumulation and Salivary Caries-Associated Bacteria in Clear Aligners Compared to Fixed Orthodontic Treatment. A Systematic Review and Meta-Analysis," *BMC Oral Health* 23, no. 1 (August 2023): 599. DOI: 10.1186/s12903-023-03257-8.

102. Qian Liu and Zhixin Song, "Incidence, Severity, and Risk Factors for White Spot Lesions in Adolescent Patients Treated with Clear Aligners," *Orthodontics & Craniofacial Research* 27, no. 5 (October 2024): 704–713. DOI: 10.1111/ocr.12791.

103. Huimin Hu, Chong Feng, Zhaowei Jiang, Lufei Wang, Sonu Shrestha, Jiarong Yan, Yu Shu, Long Ge, Wenli Lai, Fang Hua, and Hu Long, "Effectiveness of Remineralizing Agents in the Prevention and Reversal of Orthodontically Induced White Spot Lesions: A Systematic Review and Network Meta-Analysis," *Clinical Oral Investigations* 24, no. 12 (December 2020): 4153–4167. DOI: 10.1007/s00784-020-03610-z.

104. Pedro C. Lopes, Teresa Carvalho, Ana T. P. C. Gomes, Nelio Veiga, Letícia Blanco, Maria José Correia, and Anna Carolina Volpi Mello-Moura, "White Spot Lesions: Diagnosis and Treatment — A Systematic Review," *BMC Oral Health* 24, no. 1 (January 2024): 58. DOI: 10.1186/s12903-023-03720-6.

105. Maryam Khoroushi and Marzie Kachuie, "Prevention and Treatment of White Spot Lesions in Orthodontic Patients," *Contemporary Clinical Dentistry* 8, no. 1 (January–March 2017): 11–19. DOI: 10.4103/ccd.ccd_216_17.

106. Jay W. Friedman, "The Prophylactic Extraction of Third Molars: A Public Health Hazard," *American Journal of Public Health* 97, no. 9 (September 2007): 1554–1559. DOI: 10.2105/AJPH.2006.100271.

107. Joana Cunha-Cruz, Marilynn Rothen, Charles Spiekerman, Mark Drangsholt, Lyle McClellan, Greg J. Huang, and Northwest Practice-Based Research Collaborative in Evidence-Based Dentistry, "Recommendations for Third Molar Removal: A Practice-Based Cohort Study," *American Journal of Public Health* 104, no. 4 (April 2014): 735–743. DOI: 10.2105/AJPH.2013.301652.

108. Rafael Sarikov and Gintaras Juodzbalys, "Inferior Alveolar Nerve Injury after Mandibular Third Molar Extraction: A Literature Review," *Journal of Oral & Maxillofacial Research* 5, no. 4 (December 2014): e1. DOI: 10.5037/jomr.2014.5401.

109. Nabeel Sayed, Abdulaziz Bakathir, Mehboob Pasha, and Salim Al-Sudairy, "Complications of Third Molar Extraction: A Retrospective Study from a Tertiary Healthcare Centre in Oman," *Sultan Qaboos University Medical Journal* 19, no. 3 (August 2019): e230–e235. DOI: 10.18295/squmj.2019.19.03.009.

110. María Peñarrocha-Diago, Octavi Camps-Font, Alba Sánchez-Torres, Rui Figueiredo, María-Angeles Sánchez-Garcés, and Cosme Gay-Escoda, "Indications of the Extraction of Symptomatic Impacted Third Molars. A Systematic Review," *Journal of Clinical and Experimental Dentistry* 13, no. 3 (March 2021): e278–e286. DOI: 10.4317/jced.56887.

111. Richard G. Watt, Blánaid Daly, Paul Allison, Lorna M. D. Macpherson, Renato Venturelli, Stefan Listl, Robert J. Weyant, Manu R. Mathur, Carol C. Guarnizo-Herreño, Roger Keller Celeste, Marco A. Peres, Cristin Kearns, and Habib Benzian, "Ending the Neglect of Global Oral Health: Time for Radical Action," *The Lancet* 394, no. 10194 (July 2019): 261–272. DOI: 10.1016/S0140-6736(19)31133-X.

112. Paula J. Moynihan and Sarah A. M. Kelly, "Effect on Caries of Restricting Sugars Intake: Systematic Review to Inform WHO Guidelines," *Journal of Dental Research* 93, no. 1 (January 2014): 8–18. DOI: 10.1177/0022034513508954.

113. Eleanor Fleming and Joseph Afful, "Prevalence of Total and Untreated Dental Caries Among Youth: United States, 2015–2016," *NCHS Data Brief*, 2018 Apr;(307):1–8.

114. "Toothbrushes," American Dental Association, accessed April 25, 2025, https://www.ada.org/resources/ada-library/oral-health-topics/toothbrushes.

115. Ceren Özbek, Didem Eser, Kıvanç Bektaş-Kayhan, and Meral Ünür, "Comparison of the Tooth Brushing Habits of Primary School Age Children and Their Parents," *Journal of Istanbul University Faculty of Dentistry* 49, no. 1 (January 2015): 33–40. DOI: 10.17096/jiufd.19356.

116. Hugh Silk and Amy Kwok, "Addressing Adolescent Oral Health: A Review," *Pediatrics in Review* 38, no. 2 (February 2017): 61–68. DOI: 10.1542/pir.2016-0134.

117. Effat Khodadadi, Ayshe Niknahad, Mohammad Mehdi Naghibi Sistani, and Mina Motallebnejad, "Parents' Oral Health Literacy and Its Impact on Their Children's Dental Health Status," *Electronic Physician* 8, no. 12 (December 2016): 3421–3425. DOI: 10.19082/3421.

118. Clemencia M. Vargas and Cynthia R. Ronzio, "Disparities in Early Childhood Caries," *BMC Oral Health* 6, Suppl 1 (June 2006): S3. DOI: 10.1186/1472-6831-6-S1-S3.

119. Yufei Wu, Xiang Li, Hanzhe Liu, Xiao Yang, Rui Li, Hui Zhao, and Zhengjun Shang, "Organoids in the Oral and Maxillofacial Region: Present and Future," *International Journal of Oral Science* 16, no. 1 (November 2024): 61. DOI: 10.1038/s41368-024-00324-w.

120. Sylwia Bulanda, Danuta Ilczuk-Rypuła, Aleksandra Nitecka-Buchta, Zuzanna Nowak, Stefan Baron, and Lidia Postek-Stefańska, "Sleep Bruxism in Children: Etiology, Diagnosis, and Treatment — A Literature Review," *International Journal of Environmental Research and Public Health* 18, no. 18 (September 2021): 9544. DOI: 10.3390/ijerph18189544.

121. David A. Randall, "Current Indications for Tonsillectomy and Adenoidectomy," *Journal of the American Board of Family Medicine* 33, no. 6 (November–December 2020): 1025–1030. DOI: 10.3122/jabfm.2020.06.200038.

122. Chloe Friedman, Gianna Sarantos, Sarah Katz, and Sheryl Geisler, "Understanding Gastroesophageal Reflux Disease in Children," *JAAPA* 34, no. 2 (February 2021): 12–18. DOI: 10.1097/01.JAA.0000731488.99461.39.

123. Stephanie L. Jackson, William F. Vann Jr., Jonathan B. Kotch, Bhavna T. Pahel, and Jessica Y. Lee, "Impact of Poor Oral Health on Children's School Attendance and Performance," *American Journal of Public Health* 101, no. 10 (October 2011): 1900–1906. DOI: 10.2105/AJPH.2010.200915.

124. Sathyanarayan Sudhanthar, Jillian Lapinski, Jane Turner, Jonathan Gold, Yakov Sigal, Kripa Thakur, Olga Napolova, and Michael Stiffler, "Improving Oral Health Through Dental Fluoride Varnish Application in a Primary Care Paediatric Practice," *BMJ Open Quality* 8, no. 2 (May 2019): e000589. DOI: 10.1136/bmjoq-2018-000589.

125. Yasmen E. Elsadek and Sarah R. Baker, "Oral Health Promotion Through Health — Promoting Schools in Developing Countries: A Scoping Review," *Community Dentistry and Oral Epidemiology* 51, no. 6 (December 2023): 1197–1208. DOI: 10.1111/cdoe.12864.

126. World Health Organization and the United Nations Educational, Scientific, and Cultural Organization, *Making Every School a Health-Promoting School — Implementation Guidance*, 2021, https://www.who.int/publications/i/item/9789240025073.

127. Nigel B. Pitts, Svante Twetman, Julian Fisher, and Philip D. Marsh, "Understanding Dental Caries as a Non-Communicable Disease," *British Dental Journal* 231, no. 12 (December 2021): 749–753. DOI: 10.1038/s41415-021-3775-4.

128. Taís S. Barbosa and Maria Beatriz Duarte Gavião, "Oral Health-Related Quality of Life in Children: Part II. Effects of Clinical Oral Health Status. A Systematic Review," *International Journal of Dental Hygiene* 6, no. 2 (June 2008): 100–107. DOI: 10.1111/j.1601-5037.2008.00293.x.

129. Peter Akera, Sean E. Kennedy, Raghu Lingam, Mark J. Obwolo, Aletta E. Schutte, and Robyn Richmond, "Effectiveness of Primary School–Based Interventions in Improving Oral Health of Children in Low- and Middle-Income Countries: A Systematic Review and Meta-Analysis," *BMC Oral Health* 22, no. 1 (June 2022): 264. DOI: 10.1186/s12903-022-02291-2.

130. Julian Fisher, Richard Berman, Kent Buse, Bruce Doll, Michael Glick, Jonathan Metzl, and Riva Touger-Decker, "Achieving Oral Health for All Through Public Health Approaches, Interprofessional, and Transdisciplinary Education," *NAM Perspectives* 2023 (February 2023): 10–31478. DOI: 10.31478/202302b.

131. Lingli Wu, Xiaoli Gao, Edward C. M. Lo, Samuel M. Y. Ho, Colman McGrath, and May C. M. Wong, "Motivational Interviewing to Promote Oral Health in Adolescents," *Journal of Adolescent Health* 61, no. 3 (September 2017): 378–384. DOI: 10.1016/j.jadohealth.2017.03.010.

132. Lingli Wu, Edward C. M. Lo, Colman McGrath, May C. M. Wong, Samuel M. Y. Ho, and Xiaoli Gao, "Motivational Interviewing for Caries Prevention in Adolescents: A Randomized Controlled Trial," *Clinical Oral Investigations* 26, no. 1 (January 2022): 585–594. DOI: 10.1007/s00784-021-04037-w.

133. Paul I. Eke, Gina O. Thornton-Evans, Liang Wei, Wenche S. Borgnakke, Bruce A. Dye, and Robert J. Genco, "Periodontitis in US Adults: National Health and Nutrition Examination Survey 2009–2014," *Journal of the American Dental Association* 149, no. 7 (July 2018): 576–588. DOI: 10.1016/j.adaj.2018.04.023.

134. Kamyar Nasseh, Marko Vujicic, and Michael Glick, "The Relationship Between Periodontal Interventions and Healthcare Costs and Utilization: Evidence from an Integrated Dental, Medical, and Pharmacy Commercial Claims Database," *Health Economics* 26, no. 4 (April 2017): 519–527. DOI: 10.1002/hec.3316.

135. Madhuli Thakkar-Samtani, Lisa J. Heaton, Abigail L. Kelly, Shelly Dionne Taylor, Linda Vidone, and Eric P. Tranby, "Periodontal Treatment Associated with Decreased Diabetes Mellitus–Related Treatment Costs: An Analysis of Dental and Medical Claims Data," *Journal of the American Dental Association* 154, no. 4 (April 2023): 283–292. DOI: 10.1016/j.adaj.2022.12.011.

136. Crescent B. Martin, Craig M. Hales, Qiuping Gu, and Cynthia L. Ogden, "Prescription Drug Use in the United States, 2015–2016," NCHS Data Brief 334 (May 2019): 1–8.

137. Giulio Fortuna, Sarah Whitmire, Kathleen Sullivan, Ivan Alajbeg, Ana Andabak-Rogulj, Anne Marie Lynge Pedersen, Arjan Vissink, Olga di Fede, Massimo Aria, Derk Jan Jager, Jenene Noll, Siri Beier Jensen, Andy Wolff, and Michael T. Brennan, "Impact of Medications on Salivary Flow Rate in Patients with Xerostomia: A Retrospective Study by the Xeromeds Consortium," *Clinical Oral Investigations* 27 (2023): 235–248. DOI: 10.1007/s00784-022-04717-1.

138. Thomas Nederfors, "Xerostomia and Hyposalivation," *Advances in Dental Research* 14 (December 2000): 48–56. DOI: 10.1177/08959374000140010701.

139. Andy Wolff, Revan Kumar Joshi, Jörgen Ekström, Doron Aframian, Anne Marie Lynge Pedersen, Gordon Proctor, Nagamani Narayana, Alessandro Villa, Ying Wai Sia, Ardita Aliko, Richard McGowan, Alexander Ross Kerr, Siri Beier Jensen, Arjan Vissink, and Colin Dawes, "A Guide to Medications Inducing Salivary Gland Dysfunction, Xerostomia, and Subjective Sialorrhea: A Systematic Review Sponsored by the World Workshop on Oral Medicine VI," *Drugs in R&D* 17, no. 1 (March 2017): 1–28. DOI: 10.1007/s40268-016-0153-9.

140. Stephen Marcott, Karuna Dewan, Miki Kwan, Fred Baik, Yu-Jin Lee, and Davud Sirjani, "Where Dysphagia Begins: Polypharmacy and Xerostomia," *Federal Practitioner* 37, no. 5 (May 2020): 234–241.

141. Hui Ling Cheah, Michael Gray, Shahenda Aboelmagd, Abdul Basir Barmak, and Szilvia Arany, "Anticholinergic Medication and Caries Status Predict Xerostomia Under 65," *Dentistry Journal* 11, no. 4 (March 2023): 87. DOI: 10.3390/dj11040087.

142. Nan Su, Cindy L. Marek, Victor Ching, and Miriam Grushka, "Caries Prevention for Patients with Dry Mouth," *Journal of the Canadian Dental Association* 77 (2011): b85.

143. Molek Molek, Florenly Florenly, I. Nyoman Ehrich Lister, Tuka Abdul Wahab, Clarissa Lister, and Fioni Fioni, "Xerostomia and Hyposalivation in Association with Oral Candidiasis: A Systematic Review and Meta-Analysis," *Evidence-Based Dentistry* (January 2022): 1–7. DOI: 10.1038/s41432-021-0210-2.

144. José Leopoldo Ferreira Antunes, Tatiana Natasha Toporcov, Maria Gabriela Haye Biazevic, Antonio Fernando Boing, Crispian Scully, and Stefano Petti, "Joint and Independent Effects of Alcohol Drinking and Tobacco Smoking on Oral Cancer: A Large Case-Control Study," *PloS One* 8, no. 7 (July 2013): e68132. DOI: 10.1371/journal.pone.0068132.

145. Fernanda Weber Mello, Gilberto Melo, Júlia Jacoby Pasetto, Carolina Amália Barcellos Silva, Saman Warnakulasuriya, and Elena Riet Correa Rivero, "The Synergistic Effect of Tobacco and Alcohol Consumption on Oral Squamous Cell Carcinoma: A Systematic Review and Meta-Analysis," *Clinical Oral Investigations* 23, no. 7 (July 2019): 2849–2859. DOI: 10.1007/s00784-019-02958-1.

146. Emily Vogtmann, Barry Graubard, Erikka Loftfield, Anil Chaturvedi, Bruce A. Dye, Christian C. Abnet, and Neal D. Freedman, "Contemporary Impact of Tobacco Use on Periodontal Disease in the USA," *Tobacco Control* 26, no. 2 (March 2017): 237–238. DOI: 10.1136/tobaccocontrol-2015-052750.

147. Manali V. Vora and Benjamin W. Chaffee, "Tobacco-Use Patterns and Self-Reported Oral Health Outcomes: A Cross-Sectional Assessment of the Population Assessment of Tobacco and Health Study, 2013–2014," *Journal of the American Dental Association* 150, no. 5 (May 2019): 332–344. DOI: 10.1016/j.adaj.2018.12.004.

148. Sebastian-Edgar Baumeister, Janka Schössow, Gustavo G. Nascimento, Henry Völzke, Thomas Kocher, and Birte Holtfreter, "Alcohol Consumption, Risk of Periodontitis and Change of Periodontal Parameters in a Population-Based Cohort Study," *Journal of Clinical Periodontology* (March 2025). DOI: 10.1111/jcpe.14154.

149. Rajeswari Sankaranarayanan, Tuomas Saxlin, Matti Knuuttila, Pekka Ylöstalo, and Anna Liisa Suominen, "Alcohol Use and the Development of Periodontal Pockets: An 11-year Follow-up Study," *Journal of Periodontology* 91, no. 12 (December 2020): 1621–1631. DOI: 10.1002/JPER.19-0602.

150. Antonia Ivoš, Ana Matošić, Ivan Pavao Gradiški, and Ivona Orlović, "The Effects of Alcohol on Oral Health, A Review," *Archives of Psychiatry Research* 55 (May 2019): 61–70.

151. José Antonio Gil-Montoya, Tania Rivero-Blanco, Ximena Leon-Rios, Manuela Exposito-Ruiz, Iñigo Pérez-Castillo, and María José Aguilar-Cordero, "Oral and General Health Conditions Involved in Periodontal Status During Pregnancy: A Prospective Cohort Study," *Archives of Gynecology and Obstetrics* 308, no. 6 (December 2023): 1765–1773. DOI: 10.1007/s00404-022-06843-3.

152. Ana Carrillo-de-Albornoz, Elena Figuero, David Herrera, Pedro Cuesta, and Antonio Bascones-Martínez, "Gingival Changes During Pregnancy: III. Impact of Clinical, Microbiological, Immunological, and Socio-Demographic Factors on Gingival Inflammation," *Journal of Clinical Periodontology* 39, no. 3 (March 2012): 272–283. DOI: 10.1111/j.1600-051X.2011.01800.x.

153. Wei Guang Bi, Elham Emami, Zhong-Cheng Luo, Christina Santamaria, and Shu Qin Wei, "Effect of Periodontal Treatment in Pregnancy on Perinatal Outcomes: A Systematic Review and Meta-Analysis," *The Journal of Maternal-Fetal & Neonatal Medicine* 34, no. 19 (October 2021): 3259–3268. DOI: 10.1080/14767058.2019.1678142.

154. Zipporah Iheozor-Ejiofor, Philippa Middleton, Marco Esposito, and Anne-Marie Glenny, "Treating Periodontal Disease for Preventing Adverse Birth Outcomes in Pregnant Women," *Cochrane Database of Systematic Reviews* 6, no. 6 (June 2017): CD005297. DOI: 10.1002/14651858.CD005297.pub3.

155. Falk Schwendicke, Nadeem Karimbux, Veerasathpurush Allareddy, and Christian Gluud, "Periodontal Treatment for Preventing Adverse Pregnancy Outcomes: A Meta- and Trial Sequential Analysis," *PloS One* 10, no. 6 (June 2015): e0129060. DOI: 10.1371/journal.pone.0129060.

156. Linda A. Detman, Barbara H. Cottrell, and Marie F. Denis-Luque, "Exploring Dental Care Misconceptions and Barriers in Pregnancy," *Birth* 37, no. 4 (December 2010): 318–324. DOI: 10.1111/j.1523-536X.2010.00427.x.

157. Ajesh George, Maree Johnson, Anthony Blinkhorn, Shilpi Ajwani, Sharon Ellis, and Sameer Bhole, "Views of Pregnant Women in South Western Sydney Towards Dental Care and an Oral-Health Program Initiated by Midwives," *Health Promotion Journal of Australia* 24, no. 3 (December 2013): 178–184. DOI: 10.1071/HE13040.

158. Ajesh George, Simin Shamim, Maree Johnson, Hannah Dahlen, Shilpi Ajwani, Sameer Bhole, and Anthony E. Yeo, "How Do Dental and Prenatal Care Practitioners Perceive Dental Care During Pregnancy? Current Evidence and Implications," *Birth* 39, no. 3 (September 2012): 238–247. DOI: 10.1111/j.1523-536X.2012.00553.x.

159. Katherine E. Strafford, Cynthia Shellhaas, and Erinn M. Hade, "Provider and Patient Perceptions about Dental Care During Pregnancy," *The Journal of Maternal-Fetal & Neonatal Medicine* 21, no. 1 (January 2008): 63–71. DOI: 10.1080/14767050701796681.

160. Irina F. Dragan, Valery Veglia, Maria L. Geisinger, and David C. Alexander, "Dental Care as a Safe and Essential Part of a Healthy Pregnancy," *Compendium of Continuing Education in Dentistry* 39, no. 2 (February 2018): 86–91.

161. CareQuest Institute for Oral Health, *Medicaid Adult Dental Benefits Offered to Specific Beneficiary Groups*, Boston, MA: 2024, https://www.carequest.org/resource-library/medicaid-adult-dental-benefits-offered-specific-beneficiary-groups.

162. Maya Goldman, "Medicaid Cuts Put Adult Dental Care on the Chopping Block," Axios, March 4, 2025, https://www.axios.com/2025/03/05/medicaid-cuts-dental-care-coverage-risk.

163. "Dental Care Health Professional Shortage Areas (HPSAs)," Kaiser Family Foundation, accessed May 4, 2025, https://www.kff.org/other/state-indicator/dental-care-health-professional-shortage-areas-hpsas/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D.

164. Andreea Voinea-Griffin and Eric S. Solomon, "Dentist Shortage: An Analysis of Dentists, Practices, and Populations in the Underserved Areas," *Journal of Public Health Dentistry* 76, no. 4 (September 2016): 314–319. DOI: 10.1111/jphd.12157.

165. Shahinoor Rahman, Jeffrey C. Blossom, Ichiro Kawachi, Renuka Tipirneni, and Hawazin W. Elani, "Dental Clinic Deserts in the US: Spatial Accessibility Analysis," *JAMA Network Open* 7, no. 12 (December 2024): 1–13. DOI: 10.1001/jamanetworkopen.2024.51625.

166. Hannah Calladine, Charlotte C. Currie, and Chris Penlington, "A Survey of Patients' Concerns about Visiting the Dentist and How Dentists Can Help," *Journal of Oral Rehabilitation* 49, no. 4 (April 2022): 414–421. DOI: 10.1111/joor.13305.

167. David Locker, Andrée Liddell, Laura Dempster, and Deborah Shapiro, "Age of Onset of Dental Anxiety," *Journal of Dental Research* 78, no. 3 (March 1999): 790–796. DOI: 10.1177/00220345990780031201.

168. Jason M. Armfield and Manon Ketting, "Predictors of Dental Avoidance Among Australian Adults with Different Levels of Dental Anxiety," *Health Psychology* 34, no. 9 (September 2015): 929–940. DOI: 10.1037/hea0000186.

169. Jason M. Armfield, "What Goes Around Comes Around: Revisiting the Hypothesized Vicious Cycle of Dental Fear and Avoidance," *Community Dentistry and Oral Epidemiology* 41, no. 3 (June 2013): 279–287. DOI: 10.1111/cdoe.12005.

170. Jason M. Armfield, Judy F. Stewart, and A. John Spencer, "The Vicious Cycle of Dental Fear: Exploring the Interplay Between Oral Health, Service Utilization, and Dental Fear," *BMC Oral Health* 7 (January 2007): 1–15. DOI: 10.1186/1472-6831-7-1.

171. Stephan Eitner, Manfred Wichmann, Anita Paulsen, and Stefan Holst, "Dental Anxiety–An Epidemiological Study on Its Clinical Correlation and Effects on Oral Health," *Journal of Oral Rehabilitation* 33, no. 8 (August 2006): 588–593. DOI: 10.1111/j.1365-2842.2005.01589.x.

172. Arndt Guentsch, Christiane Stier, Gregor F. Raschke, André Peisker, Mina D. Fahmy, Harald Kuepper, and Ina Schueler, "Oral Health and Dental Anxiety in a German Practice-Based Sample," *Clinical Oral Investigations* 21, no. 5 (June 2017): 1675–1680. DOI: 10.1007/s00784-016-1951-8.

173. Siraj D. A. A. Khan, Naif Mahdi Alqannass, Mohannad Mesfer Alwadei, Mazen Dhafer Alnajrani, Ziyad Mohammed Alshahrani, Ali Yahya Al Alhareth, and Khalid Mohammed Alqahtani, "Assessment of the Relationship Between Dental Anxiety and Oral Health-Related Quality of Life," *Journal of Pharmacy & Bioallied Sciences* 13, no. Suppl 1 (June 2021): S359–S362. DOI: 10.4103/jpbs.JPBS_742_20.

174. Scott Reeves, Laure Perrier, Joanne Goldman, Della Freeth, and Merrick Zwarenstein, "Interprofessional Education: Effects on Professional Practice and Healthcare Outcomes (Update)," *Cochrane Database of Systematic Reviews* 2013, no. 3 (2013): CD002213. DOI: 10.1002/14651858.cd002213.pub3.

175. Dina Gordon, Richard G. Heimberg, Marisol Tellez, and Amid I. Ismail, "A Critical Review of Approaches to the Treatment of Dental Anxiety in Adults," *Journal of Anxiety Disorders* 27, no. 4 (May 2013): 365–378, DOI: 10.1016/j.janxdis.2013.04.002.

176. Pauline McGoldrick, Joyce Levitt, Ad de Jongh, Andrew Mason, and Dafydd Evans, "Referrals to a Secondary Care Dental Clinic for Anxious Adult Patients: Implications for Treatment," *British Dental Journal* 191, no. 12 (December 2001): 686–688. DOI: 10.1038/sj.bdj.4801270.

177. Ulla Wide Boman, Viktor Carlsson, Maria Westin, and Magnus Hakeberg, "Psychological Treatment of Dental Anxiety among Adults: A Systematic Review," *European Journal of Oral Sciences* 121, no. 3 Pt 2 (June 2013): 225–234. DOI: 10.1111/eos.12032.

178. John L. Reeves II and Robert L. Merrill, "The Complex Orofacial Pain Patient: A Case for Collaboration Between the Orofacial Pain Dentist and the Clinical Health Psychologist," in Roger Kessler and Dale Stafford (eds.), *Collaborative Medicine Case Studies* (Springer Nature: 2008), 217–254.

179. Kelly M. Wawrzyniak, Naila Ahmed, Ronald J. Kulich, and Shuchi Dhadwal, "Interprofessional Management of Chronic Orofacial Pain: A Topic Review, Steps to Improve Collaborative Care, and a Case Example," *Journal of the California Dental Association* 52, no. 1 (2024): 2313779. DOI: 10.1080/19424396.2024.2313779.

180. Archana Viswanath, Antje M. Barreveld, and Matthew Fortino, "Assessment and Management of the High-Risk Dental Patient with Active Substance Use Disorder," *Dental Clinics of North America* 64, no. 3 (July 2020): 547–558. DOI: 10.1016/j.cden.2020.02.004.

181. Jamie Burgess-Flowers, Lisa de Saxe Zerden, and Kelsey Yokovich, "The Social Determinants of Health, Social Work, and Dental Patients: A Case Study," *Social Work in Health Care* 63, no. 2 (January–June 2024): 117–130. DOI: 10.1080/00981389.2023.2292546.

182. Joan M. Doris, Elaine Davis, Cynthia Du Pont, and Britt Holdaway, "Social Work in Dentistry: The CARES Model for Improving Patient Retention and Access to Care," *Dental Clinics of North America* 53, no. 3 (July 2009): 549–559. DOI: 10.1016/j.cden.2009.03.003.

183. Leonard A. Cohen, "Enhancing Pharmacists' Role as Oral Health Advisors," *Journal of the American Pharmacists Association* 53, no. 3 (May–June 2013): 316–321. DOI: 10.1331/JAPhA.2013.12017.

184. Kalin L. Johnson, Kevin T. Fuji, Joseph V. Franco, Shana Castillo, Karen O'Brien, and Kimberley J. Begley, "A Pharmacist's Role in a Dental Clinic: Establishing a Collaborative and Interprofessional Education Site," *Innovations in Pharmacy* 9, no. 4 (November 2018). DOI: 10.24926/iip.v9i4.1382.

185. Cynthia Valle-Oseguera and Eric G. Boyce, "Dentists and Pharmacists: Paradigm Shifts and Interprofessional Collaborative Practice Models," *Journal of the California Dental Association* 43, no. 10 (October 2015): 591–595.

186. "Aging and Dental Health," American Dental Association, accessed May 4, 2025, https://www.ada.org/resources/ada-library/oral-health-topics/aging-and-dental-health.

187. Cesar A. Migliorati and Carlos Madrid, "The Interface between Oral and Systemic Health: The Need for More Collaboration," *Clinical Microbiology and Infection* 13, suppl. 4 (2007): 11–16, DOI: 10.1111/j.1469-0691.2007.01799.x.

188. Alessandro Villa and Silvio Abati, "Risk Factors and Symptoms Associated with Xerostomia: A Cross-Sectional Study," *Australian Dental Journal* 56, no. 3 (September 2011): 290–295. DOI: 10.1111/j.1834-7819.2011.01347.x.

189. Georgios Tsakos, Richard G. Watt, Philippe L. Rouxel, Cesar de Oliveira, and Panayotes Demakakos, "Tooth Loss Associated with Physical and Cognitive Decline in Older Adults," *Journal of the American Geriatrics Society* 63, no. 1 (December 2014): 91–99. DOI: 10.1111/jgs.13190.

190. "CMS Innovation Center Strategy to Make America Healthy Again," Centers for Medicare & Medicaid Services, accessed May 15, 2025, https://www.cms.gov/priorities/innovation/about/cms-innovation-center-strategy-make-america-healthy-again.

191. Hall P. Beck, Sharman Levinson, and Gary Irons, "Finding Little Albert: A Journey to John B. Watson's Infant Laboratory," *The American Psychologist* 64, no. 7 (October 2009): 605–614. DOI: 10.1037/a0017234.

192. Mary C. Jones, "A 1924 Pioneer Looks at Behavior Therapy," *Journal of Behavior Therapy and Experimental Psychiatry* 6, no. 3 (October 1975): 181–187. DOI: 10.1016/0005-7916(75)90096-8.

193. Alfred D. Kornfeld, "Mary Cover Jones and Peter Case: Social Learning Versus Conditioning," *Journal of Anxiety Disorders* 3, no. 3 (1989): 187–195. DOI: 10.1016/0887-6185(89)90013-3.

194. Steven C. Altabet, "Decreasing Dental Resistance Among Individuals with Severe and Profound Mental Retardation," *Journal of Developmental and Physical Disabilities* 14, no. 3 (September 2002): 297–305. DOI: 10.1023/A:1016032623478.

195. Lauren Carter, Jill M. Harper, and James K. Luiselli, "Dental Desensitization for Students with Autism Spectrum Disorder Through Graduated Exposure, Reinforcement, and Reinforcement-Fading," *Journal of Developmental and Physical Disabilities* 31, no. 2 (April 2019): 161–170. DOI: 10.1007/s10882-018-9635-8.

196. Daniel B. Shabani and Wayne W. Fisher, "Stimulus Fading and Differential Reinforcement for the Treatment of Needle Phobia in a Youth with Autism," *Journal of Applied Behavior Analysis* 39, no. 4 (Winter 2006): 449–452. DOI: 10.1901/jaba.2006.30-05.

197. Dorothy Scattone, Daniel H. Tingstrom, and Susan M. Wilczynski, "Increasing Appropriate Social Interactions of Children with Autism Spectrum Disorders Using Social Stories™," *Focus on Autism and Other Developmental Disabilities* 21, no. 4 (Winter 2006): 211–222. DOI: 10.1177/10883576060210040201.

198. Sarah K. Robinson, Marc Meisnere, Robert L. Phillips Jr., Linda McCauley, and National Academies of Sciences, Engineering, and Medicine, "Integrated Primary Care Delivery," in *Implementing High-Quality Primary Care: Rebuilding the Foundation of Health Care* (National Academies Press: 2021).

199. Katherine Gottlieb, "The Nuka System of Care: Improving Health Through Ownership and Relationships," *International Journal of Circumpolar Health* 72, no. 1 (August 2013): 21118. DOI: 10.3402/ijch.v72i0.21118.

200. Pauline Pariser, Tara O'Brien, John Kavanagh, Ian Stanaitis, Marni Salkovitch, and Magdalena Rybak, "Seamless Care Optimizing the Patient Experience (SCOPE) — Co-designing the Scaffolding for Primary Care Integration," *International Journal of Integrated Care* 19, no. 4 (2019): 372. DOI: 10.5334/ijic.s3372.

201. Aubry N. Koehler, Laura E. Sudano, Edward Ip, Stephen W. Davis, Gail S. Marion, and Julienne K. Kirk, "Patient Experience of an Integrated Care Model in a Family Practice Clinic & FQHC," *The International Journal of Psychiatry in Medicine* 55, no. 5 (2020): 357–365. DOI: 10.1177/0091217420951059.

202. Kathryn A. Atchison, Jane A. Weintraub, and R. Gary Rozier, "Bridging the Dental-Medical Divide: Case Studies Integrating Oral Health Care and Primary Health Care," *Journal of the American Dental Association* 149, no. 10 (October 2018): 850–858. DOI: 10.1016/j.adaj.2018.05.030.

203. "SBHCs in Washington," Washington School-Based Health Alliance, accessed May 18, 2025, https://wasbha.org/sbhcs-in-washington-2/.

204. "Social Determinants of Health Risk Assessment," Rural Health Information Hub, accessed May 14, 2025, https://www.ruralhealthinfo.org/care-management/sdoh-risk-assessment.

205. "Best Practice Approach: Improving the Oral Health of Older Adults," Association of State and Territorial Dental Directors, accessed May 18, 2025, https://www.astdd.org/bestpractices/improving-oral-health-older-adults-bpar2023.pdf.

206. "About Access Dental Care," Access Dental Care, accessed May 18, 2025, https://www.accessdentalcare.org/.

207. Vaibhav Vashishtha, Sunder Kote, Patthi Basavaraj, Ashish Singla, Venisha Pandita, and Ravneet Kaur Malhi, "Reach the Unreached – A Systematic Review on Mobile Dental Units," *Journal of Clinical and Diagnostic Research* 8, no. 8 (August 2014): ZE05–ZE08. DOI: 10.7860/JCDR/2014/8688.4717.

208. Shobha Tandon, Shourya Tandon, Shashidhar Acharya, and Harsimran Kaur, "Utilization of Mobile Dental Health Care Services to Answer the Oral Health Needs of Rural Population," *Journal of Oral Health and Community Dentistry* 6, no. 2 (May 2012): 56–63.

209. "The Learning Healthcare System: Workshop Summary — Institute of Medicine (IOM) Roundtable on Evidence-Based Medicine," edited by Laura A. Olsen, Dara Aisner, and J. Michael McGinnis, Washington, DC: National Academies Press (US), 2007, https://www.ncbi.nlm.nih.gov/books/NBK53494/.

210. Marko Vujicic, "Our Dental Care System Is Stuck: And Here Is What to Do About It." *The Journal of the American Dental Association* 149, no. 3 (March 2018): 167–169. DOI: 10.1016/j.adaj.2018.01.006.

211. Hermina Harnagea, Yves Couturier, Richa Shrivastava, Felix Girard, Lise Lamothe, Christophe Pierre Bedos, and Elham Emami, "Barriers and Facilitators in the Integration of Oral Health into Primary Care: A Scoping Review," *BMJ Open* 7, no. 9 (September 2017): e016078. DOI: 10.1136/bmjopen-2017-016078.

212. Abiola Adeniyi, Leeann Donnelly, Patricia Janssen, Cecilia Jevitt, HsingChi von Bergmann, and Mario Brondani, "A Qualitative Study of Health Care Providers' Views on Integrating Oral Health into Prenatal Care," *JDR Clinical & Translational Research* 6, no. 4 (October 2021): 409–419. DOI: 10.1177/2380084420961998.

213. Guillemette Lienhart, Masson Elsa, Pierre Farge, Anne-Marie Schott, Beatrice Thivichon-Prince, and Marc Chanelière, "Factors Perceived by Health Professionals to Be Barriers or Facilitators to Caries Prevention in Children: A Systematic Review," *BMC Oral Health* 23, no. 1 (October 2023): 767. DOI: 10.1186/s12903-023-03458-1.

214. Joana Berger-Estilita, Alexander Fuchs, Markus Hahn, Hsin Chiang, and Robert Greif, "Attitudes Towards Interprofessional Education in the Medical Curriculum: A Systematic Review of the Literature," *BMC Medical Education* 20 (2020): 1–17. DOI: 10.1186/s12909-020-02176-4.

215. Jessica Persson Kylén, Sara Björns, Catharina Hägglin, Lisa Bellander, Annsofi Brattbäck Atzori, Sven Persson Kylén, Ann-Christine Baar, and Helle Wijk, "Evaluation of Collaborative Oral Health Care Planning Between Older Adults and Personnel from Public Dental Care and Municipal Care Organizations: A Study Protocol for a Cluster-Randomized Controlled Study in Sweden," *Trials* 26, no. 1 (February 2025): 57. DOI: 10.1186/s13063-025-08753-6.

216. Judith Bernstein, Christina Gebel, Clemencia Vargas, Paul Geltman, Ashley Walter, Raul Garcia, and Norman Tinanoff, "Listening to Paediatric Primary Care Nurses: A Qualitative Study of the Potential for Interprofessional Oral Health Practice in Six Federally Qualified Health Centres in Massachusetts and Maryland," *BMJ Open* 7, no. 3 (March 2017): e014124. DOI: 10.1136/bmjopen-2016-014124.

217. Michael Bamberger and Linda Mabry, *Real World Evaluation: Working Under Budget, Time, Data, and Political Constraints, 3rd Edition* (California: SAGE, 2020).

218. C. Jason Wang, Tiffany T. Liu, Josip Car, and Barry Zuckerman, "Design, Adoption, Implementation, Scalability, and Sustainability of Telehealth Programs," *Pediatric Clinics* 67, no. 4 (August 2020): 675–682. DOI: 10.1016/j.pcl.2020.04.011.

219. "The Low-Down on How Health Insurance Decides What Is Covered and What Isn't," Baxrx, accessed May 14, 2025, https://www.baxrx.com/blog/the-low-down-on-how-health-insurance-decides-what-is-covered-and-what-isnt.

220. Jacob S. Kazungu, Edwine W. Barasa, Melvin Obadha, and Jane Chuma, "What Characteristics of Provider Payment Mechanisms Influence Health Care Providers' Behaviour? A Literature Review," *The International Journal of Health Planning and Management* 33, no. 4 (October 2018): e892–e905. DOI: 10.1002/hpm.2565.

221. "Health Insurance Glossary," US Census Bureau, accessed May 14, 2025, https://www.census.gov/topics/health/health-insurance/about/glossary.html.

222. "A Call for Adult Dental Benefits in Medicaid and Medicare," American Public Health Association, accessed May 14, 2025, https://www.apha.org/policy-and-advocacy/public-health-policy-briefs/policy-database/2021/01/12/a-call-for-adult-dental-benefits-in-medicaid-and-medicare.

223. "Medicare Dental Coverage," Centers for Medicare & Medicaid Services, accessed May 14, 2025, https://www.cms.gov/medicare/coverage/dental.

224. Daniel W. McNeil, Deidre B. Pereira, Olga S. Ensz, Kiran Lukose, Grant Harrell, and David B. Feller, "Toward a Comprehensive Model of Medical-Dental-Behavioral Integration," *JDR Clinical and Translational Research* 9, no. 1_suppl (October 2024): 23S–31S. DOI: 10.1177/23800844241273836.

225. Tamanna Tiwari, Maxim A. Kondratenko, Nihmath Nasiha, Jennifer Stobbs-Vergara, Deidre Callanan, Lonnie R. Johnson, and Denise Kassebaum, *Medical-Dental Integration Models: A Critical Review of the Last Decade*, Delta Dental Institute, 2022, https://www.deltadentalinstitute.com/content/dam/delta-dental-policy/pdf/UCO_MDI_White_Paper.pdf.

226. "Current Oral Health Program Funding," US Centers for Disease Control and Prevention, accessed 2024, https://www.cdc.gov/oral-health-funded-programs/funding/oral-health-program-funding.html.

227. James W. Couch and Heather Slawinski, "Nuts and Bolts of Dental Medicaid Managed Care," *North Carolina Medical Journal* 85, no. 6 (August 2024): 393–395. DOI: 10.18043/001c.125136.

228. Alternative Payment Model Framework and Progress Tracking (APM FPT) Work Group, *Alternative Payment Model (APM) Framework — Refreshed for 2017*, Health Care Payment Learning & Action Network, 2017, https://hcp-lan.org/workproducts/apm-framework-refresh-draft.pdf.

229. Curt Degenfelder, *Same-Day Billing for Medical and Mental Health Services at FQHCs: Estimating the Fiscal Impact*, California Health Care Foundation, April 2020, https://www.chcf.org/wp-content/uploads/2020/04/SameDayBillingMedicalMentalHealthServicesFQHCs.pdf.

230. "Rural Health Clinics and Federally Qualified Health Centers," 2023, Medi-Cal, accessed May 14, 2025, https://mcweb.apps.prd.cammis.medi-cal.ca.gov/assets/1E503143-95CA-446A-9418-24108E73D758/workbook_rhc_rhc.pdf?access_token=6UyVkRRfByXTZEWIh8j8QaYyIPyP5ULO.

231. Mark G. Weiner, "POINT: Is ICD-10 Diagnosis Coding Important in the Era of Big Data? Yes," *Chest* 153, no. 5 (May 2018): 1093–1095. DOI: 10.1016/j.chest.2018.01.025.

232. "Importance of ICD," World Health Organization, accessed May 14, 2025, https://www.who.int/standards/classifications/frequently-asked-questions/importance-of-icd.

233. Trever L. Sui and Douglas W. Beals, "Diabetes Screening in Dental Practice," *Decisions in Dentistry* 7, no. 2 (February 2021): 26–28, 31.

234. "Using HCPCS Code G0136 for Social Determinants of Health Risk Assessment," American Academy of Family Physicians, accessed May 14, 2025, https://www.aafp.org/family-physician/practice-and-career/getting-paid/coding/G0136-sdoh-assessment.html.

235. Tania Arthur, "Provision of Oral Preventive Services to Medicaid Eligible Children Younger than Six Years Old by Non-Dentists Providers," 2020, University of North Carolina Libraries: Carolina Digital Repository, accessed May 14, 2025, https://cdr.lib.unc.edu/concern/masters_papers/j6731708x.

236. "CalAIM Dental Initiative," California Department of Health Care Services, accessed May 14, 2025, https://www.dhcs.ca.gov/services/Pages/DHCS-CalAIM-Dental.aspx.

237. "Dental Provider Incentive Program," Florida Agency for Health Care Administration, accessed May 14, 2025, https://ahca.myflorida.com/medicaid/statewide-medicaid-managed-care/current-smmc-program/dental-provider-incentive-program.

238. "Medi-Cal 2020 Waiver Evaluation: Evaluation Plan for the Dental Transformation Initiative," California Department of Health Care Services, accessed May 14, 2025, https://www.dhcs.ca.gov/provgovpart/Documents/DTIFinalEvalDesign.pdf.

239. "Change of Plans: The Need for Innovation," Oral Health Florida, 2019 conference program, accessed May 14, 2025, https://cod-oralhealthflorida.sites.medinfo.ufl.edu/wordpress/files/2019/11/Oral-Health-Florida-2019-Conference-Program.pdf.

240. "Dental Pay-for-Quality Program," 2024, Texas Health and Human Services, accessed May 14, 2025, https://www.hhs.texas.gov/sites/default/files/documents/p4q-dental-measures.pdf.

241. "Transition of Dental Services from Fee-for-Service to Managed Care Delivery System," Health Plan of San Mateo, accessed May 14, 2025, https://www.hpsm.org/docs/default-source/hpsm/hpsm-transition-plan---integration-of-dental-services.pdf.

242. "Medicaid Accountable Care Organizations: State Update," Center for Health Care Strategies, accessed May 14, 2025, https://www.chcs.org/media/ACO-Fact-Sheet-02-27-2018.pdf.

243. Health Policy Institute, *Dental Care in Accountable Care Organizations: Insights from 5 Case Studies*, American Dental Association, accessed May 14, 2025, https://www.ada.org/-/media/project/ada-organization/ada/ada-org/files/resources/research/hpi/hpibrief_0615_1.pdf.

244. "Oral Health Coding Fact Sheet for Primary Care Physicians," American Academy of Pediatrics, accessed May 14, 2025, https://www.smilesforlifeoralhealth.org/wp-content/uploads/2020/06/coding_factsheet_oral_health_aap_2019.pdf.

245. "Rule 5160-4-33: Application of Topical Fluoride Varnish by Non-Dentist Providers," Ohio Laws & Administrative Rules, accessed May 14, 2025, https://codes.ohio.gov/ohio-administrative-code/rule-5160-4-33.

246. "Total Care for General Population (TCGP): Value Based Payment Quality Measure Set, Measurement Year 2025," New York State Department of Health, accessed May 14, 2025, https://www.health.ny.gov/health_care/medicaid/redesign/vbp/quality_measures/2025/docs/tcgp_qms.pdf.

247. "Fluoride Varnish," California Department of Health Care Services, accessed June 23, 2025, https://www.dhcs.ca.gov/formsandpubs/publications/Documents/Fluoride-Varnish-Text-Only.pdf.

248. Alex Sheen, Marcie S. Rubin, and Burton L. Edelstein, "Innovative State Oral Health Initiatives: A Qualitative Analysis of Centers for Medicare & Medicaid Services Demonstrations," *Journal of the American Dental Association* 155, no. 10 (October 2024): 825–835. DOI: 10.1016/j.adaj.2024.07.001.

249. "Ryan White HIV/AIDS Program, Part F: Dental Programs," Health Resources & Services Administration, accessed May 14, 2025, https://ryanwhite.hrsa.gov/about/parts-and-initiatives/part-f-dental-programs.

250. "Oral Health," BlueCross BlueShield of North Carolina Foundation, accessed May 14, 2025, https://www.bcbsncfoundation.org/our-work/oral-health/.

251. "Philanthropy: Grants in Oral Health," CareQuest Institute for Oral Health, accessed May 14, 2025, https://www.carequest.org/grantmaking.

252. "Grants," Delta Dental of Colorado Foundation, accessed May 14, 2025, https://deltadentalcofoundation.org/our-work/grants/.

253. Milica Jevdjevic and Stefan Listl, "Global, Regional, and Country-Level Economic Impacts of Oral Conditions in 2019," *Journal of Dental Research* 104, no. 1 (January 2025): 17–21. DOI: 10.1177/00220345241281698.

254. Kamyar Nasseh, Barbara Greenberg, Marko Vujicic, and Michael Glick, "The Effect of Chairside Chronic Disease Screenings by Oral Health Professionals on Health Care Costs," *American Journal of Public Health* 104, no. 4 (April 2014): 744–750. DOI: 10.2105/AJPH.2013.301644.

255. Sung Eun Choi, Corneliu Sima, and Ankur Pandya, "Impact of Treating Oral Disease on Preventing Vascular Diseases: A Model-Based Cost-Effectiveness Analysis of Periodontal Treatment among Patients with Type 2 Diabetes," *Diabetes Care* 43, no. 3 (March 2020): 563–571. DOI: 10.2337/dc19-1201.

256. Katja Blaschke, Martin Hellmich, Christina Samel, Stefan Listl, and Ingrid Schubert, "Association Between Periodontal Treatment and Healthcare Costs in Patients with Coronary Heart Disease: A Cohort Study Based on German Claims Data," *Dentistry Journal* 10, no. 7 (July 2022): 133. DOI: 10.3390/dj10070133.

257. Diogo L. L. Leao, Henricus-Paul Cremers, Dennis van Veghel, Milena Pavlova, and Wim Groot, "The Impact of Value-Based Payment Models for Networks of Care and Transmural Care: A Systematic Literature Review," *Applied Health Economics and Health Policy* 21, no. 3 (May 2023): 441–466. DOI: 10.1007/s40258-023-00790-z.

258. Maria C. Dolce, Jane Barrow, Ashiana Jivraj, Dalton Pham, and John D. da Silva, "Interprofessional Value-Based Health Care: Nurse Practitioner-Dentist Model," *Journal of Public Health Dentistry* 80 (September 2020): S44–S49. DOI: 10.1111/jphd.12419.

259. John Ahern, "Advancing Oral Health Equity through Medical-Dental Integration: Dental Hygienists as Catalysts for Change in an Evolving Health Care System," *Journal of Dental Hygiene* 98, no. 3 (June 2024): 8–12.

260. "2024 Costs of Caring: America's Hospitals and Health Systems Continue to Face Escalating Operational Costs and Economic Pressures as They Care for Patients and Communities," American Hospital Association, accessed May 14, 2025, https://www.aha.org/guidesreports/2025-04-28-2024-costs-caring.

261. Rebecca Harris, "The Costs of Oral Disease Prevention Versus Treatment," *British Dental Journal* 236, no. 12 (June 2024): 966. DOI: 10.1038/s41415-024-7556-8.

262. Kyle Munz, "Long-Term Benefits Show the Value of Upfront Investments in Value-Based Care," *American Journal of Managed Care*, October 17, 2024, https://www.ajmc.com/view/long-term-benefits-show-the-value-of-upfront-investments-in-value-based-care.

263. Pim P. Valentijn, "Rainbow of Chaos: A Study into the Theory and Practice of Integrated Primary Care," *International Journal of Integrated Care* 16, no. 2 (May 2016): 3. DOI: 10.5334/ijic.2465.

264. John Ahern, Brandon Pleman, Nicole O'Connor, and Hugh Silk, "Uptake of a Multilingual Intervention to Promote Toothbrushing in a Safety-Net Health Care System," *Annals of Family Medicine* 22, no. 2 (March-April 2024): 173. DOI: 10.1370/afm.3071.

265. John Ahern, Laura Sullivan, Caleb Tam, Kara Keating Bench, and Benjamin Le Cook, "Oral Health Screening by MassHealth Accountable Care Organizations: An Opportunity for Equity-Focused Interventions," *Journal of Dental Hygiene* 98, no. 3 (June 2024): 25–30.

266. Hermina Harnagea, Lise Lamothe, Yves Couturier, and Elham Emami, "How Primary Health Care Teams Perceive the Integration of Oral Health Care into Their Practice: A Qualitative Study," *PLoS One* 13, no. 10 (October 2018): e0205465. DOI: 10.1371/journal.pone.0205465.

267. Cloe Rawlinson, Tania Carron, Christine Cohidon, Chantal Arditi, Quan Nha Hong, Pierre Pluye, Isabelle Peytremann-Bridevaux, and Ingrid Gilles, "An Overview of Reviews on Interprofessional Collaboration in Primary Care: Barriers and Facilitators," *International Journal of Integrated Care* 21, no. 2 (June 2021): 32. DOI: 10.5334/ijic.5589.

268. "FDI Project: Integrated Electronic Health Records: Consensus Statement," FDI World Dental Federation, accessed June 23, 2025, https://www.fdiworlddental.org/consensus-statement-integrated-electronic-health-records.

269. Nadia Laniado, Megan Cloidt, Brian Altonen, and Victor Badner, "Interprofessional Oral Health Collaboration: A Survey of Knowledge and Practice Behaviors of Hospital-Based Primary Care Medical Providers in New York City," *Advances in Medical Education and Practice* 12 (October 2021): 1211–1218. DOI: 10.2147/AMEP.S332797.

270. Alexis Wojtowicz and Steve Olson, eds, *Integrating Oral and General Health Through Health Literacy Practices: Proceedings of a Workshop,* National Academies Press, 2019.

271. Tylor L. Gauger, Lisa A. Prosser, Margherita Fontana, and Peter J. Polverini, "Integrative and Collaborative Care Models Between Pediatric Oral Health and Primary Care Providers: A Scoping Review of the Literature," *Journal of Public Health Dentistry* 78, no. 3 (June 2018): 246–256. DOI: 10.1111/jphd.12267.

272. Patricia A. Braun and Allison Cusick, "Collaboration Between Medical Providers and Dental Hygienists in Pediatric Health Care," *The Journal of Evidence-Based Dental Practice* 16 Suppl (June 2016): 59–67. DOI: 10.1016/j.jebdp.2016.01.017.

273. Bradley C. Johnston, Donald L. Patrick, Tahira Devji, Lara J. Maxwell, Clifton O. Bingham III, Dorcas E. Beaton, Maarten Boers, Matthias Briel, Jason W. Busse, Alonso Carrasco-Labra, Robin Christensen, Bruno R. da Costa, Regina El Dib, Anne Lyddiatt, Raymond W. Ostelo, Beverley Shea, Jasvinder Singh, Caroline B. Terwee, Paula R. Williamson, Joel J. Gagnier, Peter Tugwell, and Gordon H. Guyatt, "Patient-Reported Outcomes," *Cochrane Handbook for Systematic Reviews of Interventions* (2019): 479–492.

274. David Cella, Elizabeth A. Hahn, Sally E. Jensen, Zeeshan Butt, Cindy J. Nowinski, Nan Rothrock, and Kathleen N. Lohr, "Patient-Reported Outcomes in Performance Measurement," Research Triangle Park (NC): RTI Press (September 2015).

275. Gary D. Slade and A. John Spencer, "Development and Evaluation of the Oral Health Impact Profile," *Community Dental Health* 11, no. 1 (March 1994): 3–11.

276. Kurt Kroenke, Robert L. Spitzer, and Janet B. W. Williams, "The PHQ-9: Validity of a Brief Depression Severity Measure," *Journal of General Internal Medicine* 16, no. 9 (September 2001): 606–613. DOI: 10.1046/j.1525-1497.2001.016009606.x.

277. Robert L. Spitzer, Kurt Kroenke, Janet B. W. Williams, and Bernd Löwe, "A Brief Measure for Assessing Generalized Anxiety Disorder: The GAD-7," *Archives of Internal Medicine* 166, no. 10 (May 2006): 1092–1097. DOI: 10.1001/archinte.166.10.1092.

278. Daniel Mitchell, Ardis Olson, and Natalie Randolph, "The Impact of Warm Handoffs on Patient Engagement with Behavioral Health Services in Primary Care," *Journal of Rural Mental Health* 46, no. 2 (January 2022): 82–87. DOI: 10.1037/rmh0000199.

279. Richie Kohli, Jennifer Clemens, Linda Mann, Meagan Newton, Paul Glassman, and Eli Schwarz, "Training Dental Hygienists to Place Interim Therapeutic Restorations in a School-Based Teledentistry Program: Oregon's Virtual Dental Home," *Journal of Public Health Dentistry* 82, no. 2 (March 2022): 229–238. DOI: 10.1111/jphd.12465.

280. Lisa Simon, Enihomo Obadan-Udoh, Alfa-Ibrahim Yansane, Arti Gharpure, Steven Licht, Jean Calvo, James Deschner, Anna Damanaki, Berit Hackenberg, Muhammad Walji, Heiko Spallek, and Elsbeth Kalenderian, "Improving Oral–Systemic Healthcare Through the Interoperability of Electronic Medical and Dental Records: An Exploratory Study," *Applied Clinical Informatics* 10, no. 3 (May 2019): 367–376. DOI: 10.1055/s-0039-1688832.

281. Health Level 7 International and the American Dental Association, "Dental Data Exchange," accessed May 30, 2025, https://build.fhir.org/ig/HL7/dental-data-exchange/#:~:text=PastOrPresentJob-,Audience,US%20Core%20and%20C%2DCDA.

282. "What Is FIHR?," Office of the National Coordinator for Health Information Technology, accessed May 30, 2025, https://www.healthit.gov/sites/default/files/2019-08/ONCFHIRFSWhatIsFHIR.pdf.

283. "Teledentistry," CareQuest Institute for Oral Health, accessed May 30, 2025, https://www.carequest.org/topics/teledentistry.

284. Adam Lampe, Sevinch Djalilova, Paul Glassman, and Valerie Phillips, "Improving Oral Health Using Teledentistry and Virtual Dental Homes: Concepts and Progress," *Journal of the California Dental Association* 51, no. 1 (2023): 2256035. DOI: 10.1080/19424396.2023.2256035.

285. Richa Kaushik and Ravindra Rapaka, "AI-Driven Evolution in Teledentistry: A Comprehensive Overview of Technology and Clinical Applications," *Dentistry Review* 5, no. 2 (June 2025): 100154. DOI: 10.1016/j.dentre.2025.100154.

286. Panchali Batra, Himanshu Tagra, and Sakshi Katyal, "Artificial Intelligence in Teledentistry," *Discoveries* 10, no. 3 (September 2022): 153. DOI: 10.15190/d.2022.12.

287. Lyubov D. Slashcheva, Kelly Schroeder, Lisa J. Heaton, Hannah J. Cheung, Brenda Prosa, Nicole Ferrian, Jesse Grantz, Deborah Jacobi, John J. O'Malley, Michael Helgeson, and Eric P. Tranby, "Artificial Intelligence-Produced Radiographic Enhancements in Dental Clinical Care: Provider and Patient Perspectives," *Frontiers in Oral Health* 6 (February 2025): 1473877. DOI: 10.3389/froh.2025.1473877.

288. Samira Abbasgholizadeh-Rahimi, Michelle Cwintal, Yuhui Huang, Pooria Ghadiri, Roland Grad, Dan Poenaru, Genevieve Gore, Hervé Tchala Vignon Zomahoun, France Légaré, and Pierre Pluye, "Application of Artificial Intelligence in Shared Decision Making: Scoping Review," *JMIR Medical Informatics* 10, no. 8 (August 2022): e36199. DOI: 10.2196/36199.

289. Moustaq Karim Khan Rony, Rina Parvin, and Silvia Ferdousi, "Advancing Nursing Practice with Artificial Intelligence: Enhancing Preparedness for the Future," *Nursing Open* 11, no. 1 (January 2024). DOI: 10.1002/nop2.2070.

290. Alex Roehrs, Cristiano André da Costa, Rodrigo da Rosa Righi, Sandro José Rigo, and Matheus Henrique Wichman, "Toward a Model for Personal Health Record Interoperability," *IEEE Journal of Biomedical and Health Informatics* 23, no. 2 (March 2019): 867–873. DOI: 10.1109/JBHI.2018.2836138.

291. "About Us," Joint Accreditation for Interprofessional Continuing Education, accessed May 31, 2025, https://jointaccreditation.org/about-joint-accreditation/.

292. Fatemeh Keshmiri and Yaser Ghelmani, "The Effect of Continuing Interprofessional Education on Improving Learners' Self-Efficacy and Attitude Toward Interprofessional Learning and Collaboration," *Journal of Interprofessional Care* 37, no. 3 (May–June 2023): 448–456. DOI: 10.1080/13561820.2022.2084053.

293. Catherine H. Y. Yu, Henry Halapy, David Kaplan, Ryan Brydges, Susan Hall, and Rene Wong, "Effects of a Longitudinal Interprofessional Educational Outreach Program on Collaboration," *The Journal of Continuing Education in the Health Professions* 36, no. 1 (Winter 2016): 24–31. DOI: 10.1097/CEH.0000000000000020.

294. Lynn C. Emerson and Zane L. Berge, "Microlearning: Knowledge Management Applications and Competency-Based Training in the Workplace," *Knowledge Management & E-Learning* 10, no. 2 (2018): 125–132. DOI: 10.34105/j.kmel.2018.10.008.

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