

**Integrating Oral Health, Primary Care, and Health Literacy:  
Considerations for Health Professional Practice, Education and Policy**

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## EXECUTIVE SUMMARY

A growing number of groups are calling for the integration of medicine and dentistry as a strategy to help ensure access to quality healthcare and improved outcomes for Americans. The Roundtable on Health Literacy of the National Academy of Sciences, Engineering, and Medicine commissioned an environmental scan to explore ways in which health literacy principles and practices can promote effective integration of oral health and primary care.

This discussion paper reports the results of the scan in six sections. Section One, *Introduction and Overview of Methods*, defines the basic concepts of primary care and integration, reviews existing primary care conceptual models that incorporate health literacy in some way, and proposes a framework for use in classifying the type and degree of integration observed in this environmental scan. We adapted Valentijn's Rainbow Model of Integrated Care (RMIC) to our purposes by assigning health literacy interventions to each integration level (clinical, professional, organizational, system, functional, normative) in the model. The resulting Modified-Rainbow Model for Integrated Care (M-RMIC) was applied in our review of both education and practice, including four case studies presented in Section 5.

We searched the published literature to determine preventive oral health services (POHS) provided by physicians and preventive health services (PHS) by dentists and report results in Section 2, *Current Practices and Guidelines for the Clinical Integration of Medicine and Dentistry*. This section also includes the results of a search of the literature and other sources for clinical practice guidelines or consensus statements pertaining to the provision of POHS and PHS. We found 24 studies of physicians' integration of POHS into clinical practice; almost one-half of which were pediatric services. Reports of six surveys were found reporting integration of PHS into dentists' practices. We identified 19 guidelines targeted toward physicians and 2 toward dentists.

We concluded that POHS and PHS are being integrated into the clinical practices of physicians and dentists, but their provision generally is infrequent, indicating a low degree of integration for most preventive services into current medical and dental practices. Based on the small number of guidelines and official consensus statements identified, the evidence in support of integration of POHS and PHS into clinical practice is not plentiful, in particular for dentists.

In Section 3, *Practices Demonstrating Integration of Oral Health and Primary Care*, we searched the peer-reviewed and grey literature for examples of the integration of oral health into primary care; applied the M-RMIC to the examples found in the literature; and assessed the extent that health literacy was involved in the integration efforts. Using the multi-pronged search of the literature featuring the integration of oral health and primary care, we selected 11 programs that had at least one peer-reviewed article and 13 programs that were available only in

grey literature reports or monographs. Through our outreach to the community, we located two additional integration programs that were included with the grey literature, bringing that total to 15.

Among the integration programs, there were 37 examples of POHS provided by medical providers, primarily to children, but also to pregnant women. There were 16 examples where preventive oral services were delivered by dental providers, often dental hygienists in nontraditional settings, primary care clinics, public health settings, hospital, and school-based programs. There were 22 examples demonstrating integration of case management or coordination of care services, including patient navigation for health clinics and services to bring emergency or episodic users toward a dental home. Finally, although not the intent of the environmental scan, we found 16 integration examples of dentists providing preventive health screening and referral of systemic conditions among the programs and accompanying other examples of integration of oral health into primary care. Integration program descriptions varied in length, purpose, and depth from brief vignettes focused on one aspect of integration to state-wide demonstrations to achieve the Triple Aim for the Medicaid population.

The words ‘health literacy’ infrequently were found within the publications. Nonetheless, accommodations to low health literacy were identified: extended hours so that people have more opportunities to get to a dentist, use of medical interpreters for patient education, use of anticipatory guidance, care coordination and management, reinforcement of provider health education messages, and clever uses of technology to get a message across to a patient.

In Section 4, *Integration of Oral Health Content into Health Profession Education and Continuing Education*, we provide a summary of health professional education efforts at the undergraduate, predoctoral, post-doctoral and continuing education levels that include information on integration. The context and drivers for these educational changes since 1995 are described. We reviewed surveys conducted of non-dental health profession education programs to assess oral health curriculum content and amount of time devoted to oral health, and surveys of the oral health knowledge and skills obtained by students and practitioners outside the dental professions. The published literature of individual health profession education and interprofessional education (IPE) programs that demonstrate integration was examined, as well as descriptions of some government-funded training grants. Evidence of continuing education efforts that pertain to different aspects of oral health integration was assessed primarily from 55 health professional associations’ websites. The six types of integration in the M-RMIC were applied to educational and continuing education programs.

Oral health and IPE activities are increasingly finding a place in the curricula of health professional schools and residency programs. However, the amount of time devoted to oral health remains low and topics limited. The published literature describing pre- and post-

licensure educational programs that demonstrate integration of oral health with other health professions is sparse and heterogeneous, but evolutionary developments are apparent. Continuing education programs are increasingly available in e-learning formats with less opportunity for in-person interactions across disciplines. A few non-dental health professional organizations are taking leadership roles in furthering integration with oral health initiatives. Research and evaluation of the effectiveness of educational programs that integrate oral health into primary care education and practice mostly focus on changes in knowledge and are lacking in terms of changes in provider behavior and patient health outcomes.

We present and compare four case studies in Section 5, *Overview and Presentation of Integration Case Studies*, of innovative, ongoing programs that represent different levels of oral health integration into primary care. The cases provide detailed descriptions of integration programs with variety in geography, type of organizational setting and delivery system, populations served, and performance measures that demonstrate a real or potential impact on a large population. The cases are: Into the Mouths of Babes, a pediatric North Carolina program developed to address early childhood caries and access to care issues; HealthPartners, an accountable care organization based in Minnesota that offers medical and dental insurance and provides integrated health care; Grace Health, a federally qualified health center with a Maternal Infant Oral Health program designed to increase access to dental care for pregnant women; and Willamette Dental Group in collaboration with InterCommunity Health Network, which developed a Coordinated Care Organization for medical, behavioral and dental care in Oregon under their state-mandated Medicaid health care reform.

Section 6, *Recommendations and Discussion*, presents twenty-one recommendations within three categories that will advance integration in the United States. These recommendations discuss the need for and use of:

#### An Integration Framework for Oral Health and Primary Care

1. Apply a comprehensive framework that includes integration theory, oral health, primary care, and health literacy into practice, education, research and policymaking;
2. Incorporate oral health literacy principles at all levels of a healthcare organization;

#### Activities to Promote Integration of Oral Health and Primary Care and the Inclusion of Health Literacy within Practice and Education

3. Develop implementation guides that consider all six levels of integration and evidence-based or best-practice health literacy protocols;
4. Charge a professional or governmental body with on-going review of non-traditional PHS services for use in dental practice and education and the development of evidence-based recommendations for their incorporation;

5. Prioritize oral health promotion and disease prevention in integration activities in order to reduce disparities;
6. Call on CMS and other funders of integration activities to provide adequate infrastructure and financial support for implementation and sustainability;
7. Identify a minimum set of essential oral health and oral health literacy items for Integrated-Electronic Health Records (EHR) and require their inclusion in commercial health information management software systems for patient care and health profession education;
8. Explore best ways to establish formal collaboration and referral networks among healthcare systems, medical practices and dental practices within local regions;
9. Increase the amount of time and resources devoted to oral health curriculum for all types of primary care profession education programs and at all levels of learners from undergraduates to practitioners to enhance integration; reciprocally, include screening tests for chronic conditions in dental education as the evidence-base becomes available. Understanding the roles of social service agencies should be part of health profession education;
10. Encourage academic and professional dental organizations to partner with non-dental organizations to provide education and continuing education;
11. Continue the development, promotion, dissemination, and evaluation of oral health curricula in a variety of educational formats;

Research and Reporting:

12. Develop guidelines for applying common terminology in reporting the results of integration studies and demonstration programs.
13. Develop and refine quality of care metrics that include health literacy to measure the degree of integration with other aspects of quality of care;
14. Encourage the conduct of studies of the impact of health literacy on integration of POHS into primary care and PHS into dentistry;
15. Evaluate integration strategies and oral and physical outcomes for patients obtaining POHS from non-dental and PHS from dental providers;
16. Reporting of research including case studies and demonstration programs on integration should follow a recommended protocol, including goals, methods, findings and significance for integration practices;
17. Establish a searchable repository for storing digital resources on integrating oral health and general health;
18. Give priority in research and demonstration programs on integration of oral health into primary care and the development of effective linkages between dentists and physicians in private practices;
19. Explore the development and use of Big Data to determine the impact of integration such as the effect of oral health services on general health outcomes and cost;



20. Conduct research to determine the most effective education and continuing education practices that will lead to non-dental provider changes in their clinical practice and integration of oral health in their health care delivery;
21. Commission a review to compare state practice acts, laws, regulations and policies to identify provisions that might hinder the integration of oral health and primary care, and propose and encourage model legislation and CMS requirements that could be used to remove workforce barriers.

In conclusion, health care delivery system models are rapidly developing with the potential for integration of oral health. The principles of health literacy need to be included for all Americans to reap the benefits of whole person health and healthcare. The most effective ways to better integrate oral health and primary care and implement health literacy principles in patient care, health profession education and continuing education, require research and new and revised policies.

## Introduction and Overview of Methods

### INTRODUCTION

Medical and dental care systems in the United States historically have operated in parallel if not separate universes. They typically have different education systems, national and state policies, financing mechanisms, clinic locations and professional organizations. These systems have been structured with little acknowledgement that diseases in the mouth and in the rest of the body can affect each other. Without a supporting infrastructure, patients often are left on their own to see the need and make connections between medical and dental care. This self-managed integration of medicine and dentistry is difficult for the public to accomplish because many people possess inadequate skills to navigate the two health care systems. The increasing amount and complexity of scientific knowledge for health promotion, disease prevention and care, and the transformation in social determinants known to affect health further increase the challenges faced by many people. The population is getting older, more diverse and less likely to have skills necessary to participate in today's workforce, leading to disparities in health (Kirsch et al., 2007).

Population health requires that people have access to health promotion and disease prevention services throughout life. Increasingly, professional, governmental, philanthropic organizations and the popular press are calling for the integration of medicine and dentistry as an important strategy to ensure access to quality healthcare and improved outcomes for all Americans. The Roundtable on Health Literacy of the National Academies has established a collaborative to focus on the integration of oral health and general health and the role of health literacy. The purpose of this collaborative is to explore ways in which health literacy principles and practices can promote effective integration of oral health and general health into an actionable primary care model. The ultimate goal for the collaborative is to catalyze action in the use of health literacy practices to further strengthen the goal of integrated, coordinated, patient-centered care.

As an initial step in this activity, the collaborative commissioned an environmental scan of existing practices and educational programs that integrate oral health and general health. This discussion paper reports the results of this environmental scan and related activities. The scan requires consideration of several concepts, including primary care, integrated care, the scope of services to be shared among disciplines, and the role of health literacy in the integration of dentistry and medicine. We gathered information from a variety of sources about existing practices, educational programs, guidelines and initiatives in which dentistry is integrated into primary medical care.

## The Integration Gap between Medicine and Dentistry

The US dental delivery system has a number of characteristics that distinguishes it from the medical care system, differences that can pose barriers to integration (Guay 2006; IOM 2011; Mertz, 2016). Some of these characteristics are:

1. Most dentists practice alone at a single site with little infrastructure that connects them to other health professionals. Unlike medicine, there is no central facility like a hospital that connects providers.
2. A larger proportion of dental care is financed by fee-for-service and out-of-pocket payments than for medical care.
3. Medicare Part B does not include dental benefits, and Part C plans rarely include them. Most states do not include comprehensive adult dental benefits in Medicaid.
4. Dentistry has not experienced widespread adoption of EHRs that meet meaningful use.
5. The existing EHRs used by medicine have included little to no information on oral diseases or treatment and most are not integrated with dental EHRs.
6. The dental profession does not share diagnostic and treatment codes or insurance billing and payment systems with medicine.
7. Quality improvement methods and practices are not widespread, and made difficult by dentistry's lack of use of diagnostic codes.
8. A large proportion of the growing geriatric population does not have dental insurance. Medicare does not include dental benefits.
9. Education of the dental workforce is largely separated from medicine, pharmacy, nursing, and public health, in some cases not even on the same campus.
10. Dental disease does not have the characteristics of an insurable risk as most people experience some amount of dental disease during their lifetimes, and require regular dental visits.
11. National dental expenditures are a small percentage of total healthcare expenditures and are not a driving force in transformation of healthcare to control costs.
12. Some state practice acts limit the scope of practice for some members of the dental team and require more restrictive supervision than medicine.

These differences are among the many factors that promote the continued separation of medicine and dentistry in practice, education and policymaking. The separation of dentistry and medicine in turn makes for one of the predominate distinguishing features of the dental care system, its almost total isolation from medicine in most communities in the United States.

### Concepts of Primary Care, Integration and Health Literacy Defined

Three overlapping questions define the broad scope of this review: (1) What is primary care? (2) What is integrated care? and (3) Does a framework or any other type of guidance exist that

incorporates a role for health literacy in the integration of oral health services into primary medical care?

### *Primary Care.*

Primary care is defined by the Institute of Medicine as “the provision of *integrated, accessible health care services* by clinicians who are *accountable* for addressing a large *majority of personal health care needs*, developing a *sustained partnership* with *patients*, and practicing in the *context of family and community*” (Donaldson et al., 1996). The American Academy of Family Physicians (2017) defines primary care as “that care provided by physicians specifically trained for and skilled in comprehensive first contact and continuing care for persons with any undiagnosed sign, symptom, or health concern (the “undifferentiated” patient) not limited by problem origin (biological, behavioral, or social), organ system, or diagnosis.”

Primary care is considered to be the “foundation of an effective health care system” and essential to achieving its objectives—better population health outcomes, improved equity in access and controlled expenditures (Donaldson et al., 1996; Atun, 2004). The Affordable Care Act (ACA) is designed to strengthen many aspects of the primary care experience and outcomes. It expands access by increasing insurance coverage, provides incentives for improving care in a patient-centered home, and encourages service delivery models that are accountable for providing quality care for defined populations. These changes provide new opportunities for the integration of dental and medical care.

### *Integration.*

Integration is a basic principle of primary care espoused in most definitions. As an example, the Institute of Medicine (IOM) (Donaldson et al., 1996) says that the function of primary care is to promote first contact, integrated care that encompasses “the provision of comprehensive, coordinated, and continuous services that provide a seamless process of care”. In practice, integration in medical care requires a complex, multidimensional, multilevel strategy designed to achieve a multiplicity of goals (e.g., access, efficiency, quality). Efforts to integrate medical services have evolved over many years and were designed to bring primary care and tertiary care closer together toward one system of care for the patient, an aim that generally does not apply to dentistry. As we begin to integrate dental services into the medical care system a challenge is that the literature on integration in medical care consists of a “...bewildering array of vague and confusing terms and concepts” and thus provides unclear guidance (Kodner and Spreeuwenbert, 2002). We face knowledge gaps in strategies to integrate dentistry and medicine and lack a consensus on one conceptual model that fits the U.S. healthcare system.

A commonly referenced definition of integration is one by Leutz (1999): “The search to connect the healthcare system (acute, primary medical and skilled) with other human services systems (e.g., long-term care, education and vocational and housing services) to improve outcomes

(clinical, satisfaction and efficiency).” This definition reflects the complexity of the healthcare system and potential challenges faced in not only conceptually defining the integration of dentistry and primary care, but implementing strategies to accomplish such integration.

At the conceptual level, both the IOM and AAFP definitions provide for the integration of oral health services into primary care. The IOM (Donaldson et al., 1996) definition refers to an essential characteristic of primary care clinicians: “...that they receive all problems that patients bring—*unrestricted by problem or organ system*—and have the appropriate training to diagnose and manage a large majority of those problems and to involve other health care practitioners for further evaluation or treatment when appropriate.” The definition of primary care by the American Academy of Family Physicians (AAFP) also is relevant to our work because it defines “primary care” as care not limited by organ system, which should encompass the mouth.

### *Health Literacy.*

Health literacy is the capacity of individuals to obtain, process, and understand basic health information and services needed to make appropriate health decisions (IOM, 2004). A definition derived from a systematic review of definitions and conceptual frameworks defines health literacy as being: “...linked to literacy and entails people’s knowledge, motivation and competences to access, understand, appraise, and apply health information in order to make judgements and decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life during the life course” (Sorensen et al., 2012). Health literacy skills are considered essential for health and well-being because disease prevention and treatment requires the full engagement of the patient in decision-making and self-management. Yet, many people are unable to obtain or use health information because of their poor literacy skills. Poor oral health literacy is associated with a number of undesirable oral health outcomes—low oral health knowledge (Macek et al., 2010), harmful oral health behaviors (Jones et al., 2007), elevated emergency dental care expenditures (Vann et al., 2013), poor oral health status (Parker and Jamison, 2010; Lee et al, 2012; Wehmeyer et al., 2014), factors associated with poor dental attendance (Holtzman et al, 2014); and reduced oral health-related quality of life (Divaris et al., 2011).

One aim of our environmental scan is to explore the role of health literacy in the integration of dentistry and medicine. Strategies to address low health literacy traditionally sought to make available to individuals appropriately designed and targeted educational materials. Clinicians often considered low health literacy as a patient “risk factor” that needs to be dealt with primarily through the individual’s own behaviors. Recently, views of health literacy and strategies to address low literacy have shifted from a primary focus on individuals and printed educational materials to the role of clinicians, institutions and systems in meeting the demands healthcare places on patients with low health literacy (Koh and Rudd, 2015; McCormack et al., 2017).

Several frameworks explicitly link health literacy practices to elements of the primary care model. Koh et al. (2013) proposed the *Health Literate Care Model*, which is based on the premise that providers should consider all patients at risk of not understanding information. They then link components of the patient-centered medical home (PCMH) to specific health literacy practices contained in the Agency for Healthcare Research and Quality (AHRQ) Health Literacy Universal Precautions Toolkit (Brega et al., 2015). Ridpath et al. (2012) present a framework that relates individual tasks requiring health literacy skills (i.e., understanding health information, navigating health services, making treatment decisions, participating in self-care) to expected patient experiences in the PCMH (e.g., use of clear communication by the provider is linked to improved patient understanding).

Batterham et al. (2016) take a broader view of health literacy practices than Koh et al. (2013) and Ridpath et al. (2012), but still limit application of health literacy practices to only three levels—the patient, personnel and organization levels. McCormack et al. (2017) take the broadest view of any authors in the literature in constructing their conceptual model, referred to as the *Health Literacy Social Ecological Model*. Their model is most closely aligned with current views of health literacy. They propose that health literacy and patient engagement at the clinical level is affected by factors at the individual, interpersonal, organizational, community and macro levels. They present examples of health literacy interventions at each level of their framework.

These recent papers help advance conceptual thought about health literacy and health care reform, bring attention to the specific role of health literacy in primary care, and help organize efforts to improve care. However, none of these models presented in the literature directly address how health literacy might fit into integration efforts for medicine and dentistry. We put forward in this discussion paper the supposition that oral health literacy is a major cornerstone in the successful integration of these two disciplines, but any unique health literacy practices needed in an integrated system beyond those needed or proposed in existing frameworks in primary medical care are unknown.

### Growing Interest in Integration

Many governmental agencies, professional organizations, philanthropic foundations, accrediting bodies, advocacy groups, scientists and educators have called for the integration of dentistry and medicine. Although recommendations for the integration of medicine and dentistry have a long history, the recent emphasis is anchored in most people's minds to release of the Surgeon General's Report on Oral Health (US DHHS, 2000), his follow-up Face of the Child Workshop, and the National Call to Action for Oral Health (US DHHS, 2003). These reports and related activities emphasized the association of oral health and general health, and highlighted the role of primary care and a multidisciplinary team in improved oral health. The Call to Action specifically identified the need to enhance oral health literacy as a necessary strategy to help

eliminate disparities in oral health. Attention to these concerns has increased over the last decade, and many groups have undertaken activities to promote and facilitate dental-medical integration (Kaste and Halpern, 2016a; Joskow, 2016).

Publications identified in our literature review for this section of our report provide a number of insights into activities and progress related to the integration of medicine and dentistry. Interest in integration of oral health into primary care has yielded: (1) justification for integration of oral health into primary care; (2) core competencies for collaborative practice; (3) frameworks and clinical guidelines for discipline-specific integration (e.g., pediatrics, nursing, OBGYN, geriatrics); (4) case studies of different types of integration models and experiences with them in real life; (5) demonstration programs with various examples of integration practices; (6) implementation guides on integration based on the demonstration programs; and (7) primary care health professional education and continuing education programs that include oral health. Nevertheless, comprehensive reviews on the integration of oral health have not been done and are needed to clarify approaches.

An entire issue of *Dental Clinics of North American* has been devoted to the topic (Kaste and Halpern, 2016b). The Patient Protection and Affordable Care Act and Medicaid policies promote the integration of preventive oral health services into primary care for children through payment of non-dental providers for preventive oral health services. Private payers also are paying primary care providers for some preventive oral health services, and topical fluoride treatments among others are now included in the AAP/Bright Futures periodicity schedule. NIDCR has listed the integration of oral health and overall health research as one of five priority areas in its 2030 strategic plan.

An underlying premise for these activities is the belief that improvements in population health require increased access to all aspects of health promotion and disease prevention throughout life, which in turn will require integration of medicine and dentistry. The science for oral health promotion and disease prevention is well developed. Yet evidence for the effective dissemination and implementation of these services in integrated medical-dental care is not well supported, nor is their impact on access, quality of care, patient or provider satisfaction, oral health status or costs generally known.

### Why the Interest in Integration of Medicine and Dentistry?

A number of health care trends have motivated a focus on the integration of medicine and dentistry in practice and education. A primary motivation is the desire among policymakers to improve access to care, particularly for the most vulnerable among the population whose lack of preventive care leads to poor oral health requiring expensive treatment. The primary focus of policymakers in these integration efforts has been on children and pregnant women who often

have public insurance but poor access to dentists' services, even essential preventive services. This reason for a focus on integration strategies is bolstered by ethical and moral concerns about dental delivery systems not responding to population needs.

A second major motivation is the relationship between oral health and other chronic health problems. The Surgeon General's Report on Oral Health in 2000 concluded that oral infections are associated with a number of health conditions. A wealth of research since that publication has explored causal associations of oral infections with type 2 diabetes, heart disease, pulmonary disease, and adverse pregnancy outcomes, among others (Monsarrat et al., 2016). The growing biological and health services knowledge base on the bidirectional or unidirectional relationships of oral infections and other chronic diseases highlights the potential and need for considering oral and general chronic diseases concurrently in healthcare delivery. The assumption underlying this rationale is that integration of medical and dental care will result in better overall health outcomes.

Several insurance companies have made a business case for the treatment of chronic oral health problems that are biologically associated with other chronic diseases such as diabetes (Nasseh et al., 2017; Jeffcoat et al., 2014). One group estimated that an insurance benefit for periodontal disease care in particular would result in a savings from reduced medical costs of \$64 billion over 10 years (Avalere, 2016).

To implement integration efforts in practice with the goal of improving health outcomes, the health workforce needs to be prepared starting with their professional, pre-licensure education. There has been a growing movement toward interprofessional education (IPE) and interprofessional collaborative practice as part of the training process. The associations of six national professional school organizations came together in 2009 and established an Interprofessional Education Collaborative (IPEC) to promote team-based care.

In 2011, the IPEC released a set of four core competencies to guide curricula content and structure across health profession schools. These domains include: 1) values/ethics for interprofessional practice, 2) roles/responsibilities, 3) interprofessional communication, and 4) teams and teamwork (Interprofessional Education Collaborative Expert Panel, 2011). In 2016, nine additional professions joined the IPEC, and the competencies were updated to increase the focus on population health and interprofessional collaboration (Interprofessional Education Collaborative, 2016). IPE is an initial step towards having different health professions learning about each others roles and responsibilities, how to communicate and work together, and provide team-based care, especially to improve quality and safety.

Finally, a number of trends in health care are contributing to this interest in integration of primary care medicine and dentistry. Some of these trends are: an increase in the number of



FQHCs, which are good potential sites for co-located, integrated care for vulnerable populations; growth in large group dental practices and decline of solo dental practices; changes brought on by the ACA that promote Accountable Care Organizations; and changes in dental practice acts in some states that permit more flexibility for dental hygiene practice, like co-location in medical offices.

### Overview of Integration Models

Until recently, most conceptual models for integration in medicine were based on some variation of the models in which the degree of integration is represented as a continuum from isolation to co-location of service delivery, with or without full integration (Doherty et al., 1995; Leutz, 1999). Integrated services in these models are defined primarily by the location where patient care is provided and the closeness of the relationship among providers. This framework has served as a foundation for research and practice in integration and primary care, particularly mental health and substance abuse services, and in the initial stages of medical and dental integration (GIH, 2012; Heath et al., 2013).

Valentijn et al. (2013, 2015) recently introduced the Rainbow Model of Integrated Care (RMIC), which considers a broader array of health system elements for integration than traditional models (i.e., clinical, professional, organizational, system, functional, and normative). They describe the framework as follows: “The conceptual framework combines the functions of primary care with the dimensions of integrated care. Person-focused and population-based care serve as guiding principles for achieving integration across the care continuum. Integration plays complementary roles on the micro (clinical integration), meso (professional and organizational integration) and macro (system integration) levels. Functional and normative integration ensure connectivity between the levels.” The model allows for “...integration to be pursued at different levels within a system to facilitate the continuous, comprehensive, and coordinated delivery of services for individuals and populations.”

Another important trend in the conceptual development of integrated practices and research is a consideration of the horizontal integration of healthcare systems with community-based public health and social services (Martin et al., 2016; Edelstein, 2017). This consideration expands integration beyond the healthcare system alone and recognizes the importance that other community agencies such as Women, Infants and Children (WIC) and Head Start can have on providing oral health services. Historically, the role of social determinants in health have been recognized but direct intervention with these risk factors by healthcare providers avoided because of concerns that interventions are not available or that they might be ineffective. Nevertheless, this model is supported by the Centers for Medicare and Medicaid Services (CMS) as part of its Accountable Health Communities Initiative (CMS, 2017).

Interest in the integration of oral health and primary care has grown among governmental, professional and philanthropic agencies over the last decade. The U.S. Department of Health and Human Services (2016), the Institute of Medicine (2011), the Interprofessional Education Collaborative (2011) and others support integration of oral health services into primary care. However, integration of medical and dental care is in its early stages of development with no apparent unifying framework. Current efforts to implement integration models focus mostly on the integration of oral health into clinical primary care or collaboration models in which medical and dental providers who are in different locations consult about the patient and may refer patients to each other.

The RMIC framework is being used as the basis of a review of integration of oral health into primary care now underway in Canada (Emami et al., 2016). Rubin and Edelstein (2016) have provided three models (siloes, overlapped, integrated) for the integration of dental care and medical care. The emphasis of these models in their opinion piece is on dental care systems and the implications of different payment methods. The continuum of integration that underlies many integration frameworks is evident in the three models, but the emphasis is narrowly focused on systems.

Integration efforts in oral health have started to consider the role for health literacy in integration. A report from HRSA (US DHHS, 2014) included “communication and education” as one of 5 core competency domains in its Inter-professional Oral Health Care Clinical Competencies (IOHCCC). A subsequent users’ guide for implementation of IOHCCC addressed potential activities during primary care visits, including education, take-home materials, motivational interviewing, and waiting room education (National Network for Oral Health Access, 2015). At least one review of medical-dental integration used the IOHCCC domains as a way to measure integration (Health Management Associates, 2016). Core Competencies for Inter-professional collaborative practice proposed by the Inter-professional Education Collaborative (2011) include inter-professional communication as one of four domains in its core competencies.

## PURPOSE OF ENVIRONMENTAL SCAN

This environmental scan and discussion paper will identify the existing means and practices being used to promote the effective integration of care that provides patients with knowledge, understanding, and decision-making that fosters a holistic approach to dental and medical care. As instructed by the Roundtable, we provide:

1. A literature review of publications related to the integration of dental health and general health. To the extent that such information exists this review should also include publications related to use of health literacy in such integration efforts.

2. A list and summary descriptions of existing practices that integrate dental health and general health as well as any health literacy approaches used in these practices.
3. A summary of professional education efforts in both dental and medical education (both professional schools and continuing education) that include information on integration.
4. Case studies of four integration efforts that describe these practices in detail, including any future plans the practices may be developing for improving their efforts.
5. A discussion of how and what health literacy practices can be used to further integration and promote effective, patient-centered care.

We have added a sixth task not identified in the original task order provided by the Roundtable. We will identify current preventive oral health services (POHS) by physicians and preventive health services (PHS) by dentists reported in the literature, as well as clinical practice guidelines that provide recommendations for evidence-based or consensus-based POHS and PHS. We concluded that this information was necessary to better define the scope of medical and dental integration, which would help define our searches.

## OVERVIEW OF METHODS

Members of the Roundtable on Health Literacy served as a steering committee for the project and helped to clarify the scope of the task and research question; provided technical information and firsthand knowledge of the existence of ongoing projects that might not have been published; reviewed the work product; helped to interpret the findings; and critiqued the work.

We present results for our review of clinical practices/ guidelines, the environmental scan of existing practices and education programs that integrate dentistry into primary care, and four case studies in separate chapters of the report. We briefly review methods used in the environmental scan and other work identified in the task order in this section, but provide a more detailed explanation of methods relevant to each task in the report.

Multiple strategies were used to identify examples of dental-medical integration practices, and professional education and continuing education efforts. We searched for published and grey literature using Medline, Google Scholar and the Internet. In order to calibrate the article selection, a first stage of article selection was made by one author, then the three authors discussed articles to standardize our inclusion criteria. We also reviewed program offerings at national meetings, inviting representative speakers to meet with us, and reviewed continuing education courses. We reviewed websites of 50 health profession organizations to search for CE courses and other educational materials relevant to integration. Of particular interest was the extent to which websites of non-dental organizations included information about oral health. We also conducted a literature review of surveys of different non-dental and dental health

professionals soliciting information on dental and medical integration practices. We reviewed the literature on the oral health content of curricula during undergraduate or predoctoral and postdoctoral education. Abstracts of current HRSA-funded predoctoral and postdoctoral training programs in general, pediatric and public health dentistry were reviewed for elements of oral health-primary care integration.

We developed four case studies, chosen to represent successful integration of dentistry and medicine. They present different integration types, oral health conditions and populations. The cases focused on integration of clinical services into primary care; the integration of dental providers into primary care practices; the integration of dental and medical clinics through collaboration; and the integration of dental and medical systems under a single organization. Primary data collection by way of face-to-face interviews of key informants, telephone, and email were conducted, supplemented by secondary sources of information from the literature, documents provided or on the Internet. We also report on the role of health literacy in the integration of dentistry and primary care observed in the case studies, and what the integration experience tells us about each type of integration.

### Scope of Review

The scope of our review is defined largely by our agreed upon definitions of primary care, integration and health literacy. These definitions and clinical guidelines identify key elements of medical-dental integration and health literacy and allow us to identify practices and potential voids in a comprehensive and effective approach to integration. We focused the search criteria for existing practice models (Task Order No. 2) on examples of primary care physicians providing oral health services, not dentists providing medical screening and referral services in dental offices. However, this search did identify and include examples where preventive health services were provided by dentists or dental hygienists as part of initiatives in which preventive oral health services were provided as part of primary care. We exclude specialty care from our review because it represents a small segment of dental care and results are unlikely to be generalizable to the large segment of the public that might benefit from integration. We further limit our searches to reported experiences with integration of oral health and primary care in the United States.

The importance of social determinants as contributing factors to disparities in access to care and oral health outcomes has long been recognized. However, increasingly the importance of health professionals considering and even intervening with social determinants is being recognized as needed if progress is to be made in narrowing the gap in outcomes. Low-income families interact frequently with a large number of community programs in addition to the healthcare system, providing many opportunities for exposure to oral health services and educational messages. Oral health services are being integrated into school-based health programs, early

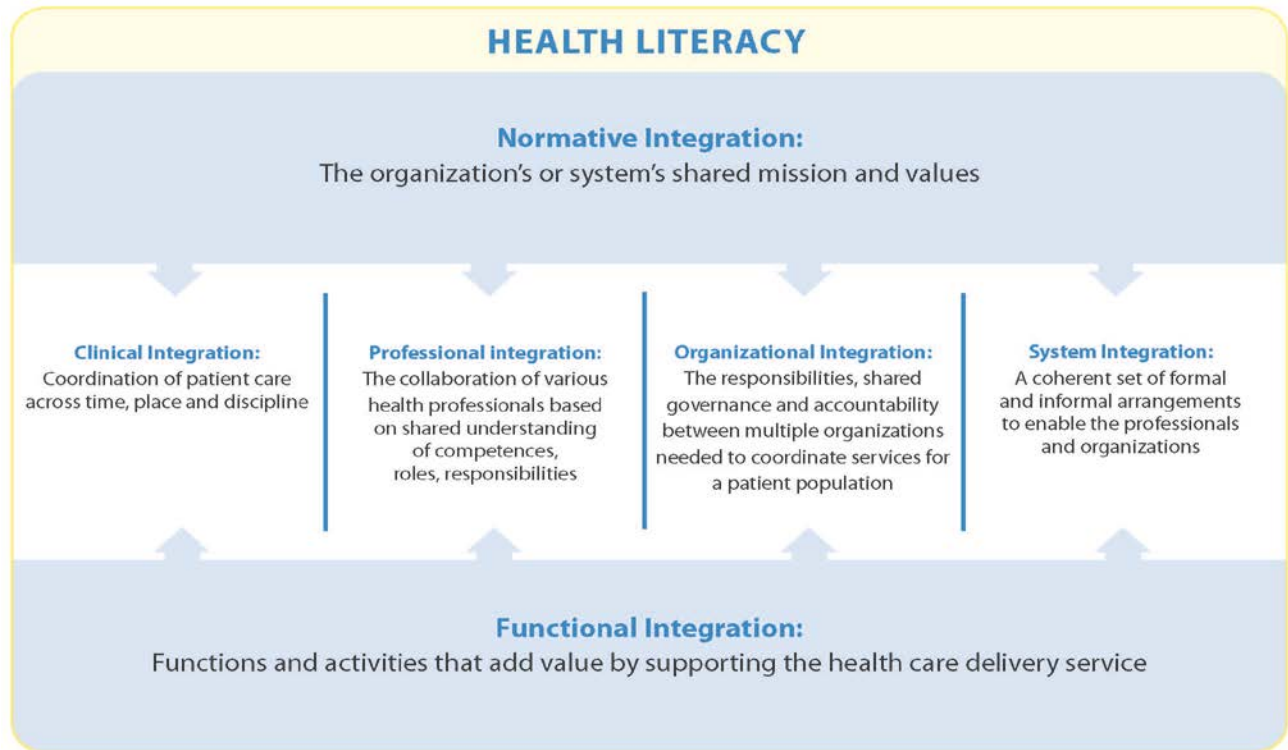
education and childcare programs, WIC clinics, long-term care facilities and other community-based settings (Lowe et al., 2016). We chose to exclude these integration efforts in community-based programs, if stand-alone programs, because they typically do not represent primary medical care, rather the intersection of primary care with social services or other non-medical systems.

### Conceptual Model Used for Environmental Scan and Case Reports

We use the framework displayed in Figure 1-1 for the environmental scan and the reporting of integration observed in the four case studies. Our framework relies heavily on the RMIC, including its six dimensions of integration and the taxonomy of key features for each dimension (Valentijn et al., 2013, Valentijn et al., 2015). Differences between the U.S. and European health care systems led us to add features that we considered “essential” to integration of dentistry into primary care in the United States, particularly in the systems and functional integration dimensions.

We incorporate the continuum of integration concept (Leutz, 1999) into the framework as recommended by Bautista et al. (2016), and link recommended health literacy practices to each of the six dimensions. Health literacy practices at the different levels of the model are based on the Literacy Social Ecological Model proposed by McCormack et al. (2016), supplemented by the literature on health literacy practices in patient-centered primary care (Koh et al., 2013; Ridpath et al., 2012; Batterham et al., 2016; Brega et al., 2015; Horowitz et al., 2014; Weaver et al., 2012). Our modification of the original RMIC is referred to throughout the report as the Modified-Rainbow Model of Integrated Care (M-RMIC). Operational definitions (taxonomy of key features) of the six dimensions of integration proposed for the M-RMIC and the alignment of potential health literacy practices with each dimension are provided in Section 3 (Figure 3-1). Our adaption of the RMIC to inter-professional education is presented in Section 4.

The M-RMIC is based on several assumptions that we believe support it being a realistic and helpful guide to evaluate implementation strategies to integrate dentistry and primary care. We believe that the model aligns with the current U.S. dental care delivery system with a *no integration* anchor, but offers a pathway to move from the current medical and dental systems with little integration to a more effective and efficient patient-centered model with the appropriate degree of integration. It allows for *full integration* should it become more prevalent in the future. We assume, as has been reported in the extensive literature on the topic, that in their conceptualization and measurement of integration in medicine, everyone “has captured some of the truth” and many of the dimensions used in published frameworks can be applied to the integration of dentistry and primary medical care (Browne et al., 2007).



Reference: Valentijn et al., 2013.

**FIGURE 1-1** Simple Modified-Rainbow Model of Integrated Care (M-RMIC)

We recognize, however, that the dental care system differs from medicine in ways that might affect integration and its measurement. Financing of dental care, for example, covers segments of the population (children supported by CHIP, some Medicaid expansion for adults, employer coverage for families, out-of-pocket for many), indicating the need for a conceptual model that includes dimensions of the RMIC (clinical, professional, organizational, systemic, functional, and normative integration), but clearly identifies the foci of integration (e.g., the population served, such as communities or subgroups based on chronic disease or children); and degree of integration (e.g., none, linkage, coordination, full).

The underlying premise for integration of dentistry into primary care generally differs from medicine. Among the primary reasons for integration in medicine is that "Integrated care offers to transfer the focus of care from high-cost hospitalizations to lower-cost ambulatory settings" (Bautista et al., 2016). Early integration of oral health and primary care in the U.S. was sought to improve access to services, particularly preventive services for low-income and vulnerable children and ultimately reduce disparities in oral health (U.S. DHHS, 2000).

## ORGANIZATION OF REPORT

The next section of the report presents results of our literature review of current preventive oral health services (POHS) by physicians and preventive health services (PHS) by dentists. This section also includes the results of a search of published and grey literature for clinical practice guidelines or consensus statements pertaining to the provision of POHS and PHS. The next two sections of the report, Sections 3 and 4, present results of our search for examples of existing integration practice types, followed by findings from our search of oral health education in curricula of primary health care profession education and elements of integration in continuing education. Section 5 presents the four case studies, and the final Section 6 provides recommendations based on our findings and interpretations.

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## **Current Practices and Guidelines for the Clinical Integration of Medicine and Dentistry**

### **BACKGROUND**

Integration of medicine and dentistry requires knowledge, skills and competencies at each level and dimension of integration to achieve good outcomes (IPEC, 2011). For example, policymakers and their technical advisors need to be familiar with different models and best practices for integration so that they can advocate appropriately for their adoption. Collaboration between disciplines in different practice locations requires effective communication and respect for shared values. Integration at the clinical level requires knowledge of recommended practices and evidence-informed decision-making. This requirement in turn requires clear guidelines and recommendations on clinical practices.

Preventive oral health services (POHS) now are considered an essential component of the well-child visit after more than 20 years of research and advocacy (Hagan et al., 2017). The standard of care for physician-delivered POHS targeted toward other population groups like adults with diabetes, cardiovascular diseases or other chronic or infectious diseases is less well developed than for pediatrics. The integration of preventive health services (PHS) into dental practice, i.e., delivery of preventive medical services like screening for HIV, has received less attention than the delivery of POHS in medical practice. A number of opinion papers have been written about the role of dental providers in the delivery of PHS for common chronic medical conditions (Giddon et al., 2013; Greenberg et al., 2012). In addition, a few feasibility and acceptability studies have explored non-traditional practices for dental providers (Mosen et al., 2012; Greenberg et al., 2017). Of particular importance, yet lacking is a comprehensive review across diseases and provider types of clinical preventive oral and general health services that dentists and physicians should share.

Completing the environmental scan requested by the National Academies of Sciences Engineering & Medicine (NASEM) Roundtable on Health Literacy requires that we establish the scope of practice for medical and dental providers in the non-traditional areas of their practices. Such a review will help inform our environmental scan of existing practice models described in Section 3. It also will provide some insights into the potential for increasing access to medical and dental services where providers who traditionally provide those services are limited.

## Purpose

The purpose of this Section of our report is to identify: (1) the POHS primary care physicians and other members of the non-dental workforce report providing in practice; and (2) the PHS dental professionals currently report providing in their practices. We also will: (3) identify and review clinical guidelines and consensus documents to determine clinical POHS or PHS recommended for the respective disciplines. Secondly, in the process of reviewing guidelines and recommended best practices we will highlight evidence-based guidelines, and thus document the evidence in support of clinical integration of medicine and dentistry.

## METHODS

### Search Strategy

In consultation with Kathleen McGraw, dental librarian at UNC-CH Health Sciences Library, multiple strategies were developed and applied in three separate searches for information related to the following: (1) physicians' clinical practices targeting oral diseases and risk factors; (2) dentists' clinical practices related to medical conditions not traditionally included in their clinical practices; and (3) clinical practice guidelines for primary care physicians and dentists providing preventive oral health services and preventive health services, respectively.

For the searches of physician and dentist practices, iterative searches of PubMed were conducted using a combination of three sets of keywords and MeSH terms. One set covered types of health care providers. For physician dental practices we included the following keywords: physician, physicians, medicine, medical, pediatrician, pediatricians, pediatric, "primary care", "family medicine", obstetrician/ gynecologist, cardiologist, nurse, and nurses. For dentists we included "dentist" and "dentists". The second set included oral health terms for the search of physician practices as follows: oral health, dental health, dental caries, periodontal disease and oral cancer. For dentists, terms included: chronic diseases, diabetes mellitus, cardiovascular disease, cerebrovascular disease, hypertension, HIV/AIDS, maternal health, oncology, renal disease, respiratory disease, obesity, tobacco use, osteoporosis, and infectious diseases. The third set of terms was identical for physicians and dentists and covered preventive health practices: screening, examination, oral assessment, evaluation, laboratory tests, risk assessment, counseling, advice, and referral. The PubMed "similar article" function was used. Searches using these terms also were conducted in Google Scholar to identify highly cited articles that contained citations to relevant articles. We also searched reference lists of key articles.

The IOM (2011) defined clinical practice guidelines as "statements that include recommendations intended to optimize patient care that are informed by a systematic review of

evidence and an assessment of the benefits and harms of alternative care options." It recommends that a panel of experts review the evidence included in the systematic review, and provide ratings of the quality of evidence and the strength of the recommendations. Because of the early stages of integration of medicine and dentistry, we designed a broad search strategy to identify not only formal clinical guidelines that meet the IOM definition, but also informal guidelines, clinical guidance statements, best practices advice, and consensus papers formulated by professional or governmental organizations.

We searched for guidelines and policy statements in guideline repository websites, websites of various key guideline development organizations, and dental professional organization, plus MEDLINE, PubMed, Google Scholar and other databases. Iterative searches of PubMed were conducted using a combination of three sets of keywords and MeSH terms. The first two sets were identical to the search for current practices. The third set of keywords was the same as for the practices searches, but with the words “guideline”, “guidelines“, “practice guidelines”, “clinical guidelines”, and “best practices” added.

We searched the website of almost 2 dozen professional organizations involved in oral health, with involvement being identified as sponsors of Smiles for Life, a widely used on-line oral health curriculum. We searched the following guideline depositories: AHRQ National Guideline Clearing House [https://www.guideline.gov/https://www.guideline.gov/search?f\\_Clinical\\_Specialty=Dentistry&f\\_LockTerm=Dentistry](https://www.guideline.gov/https://www.guideline.gov/search?f_Clinical_Specialty=Dentistry&f_LockTerm=Dentistry); Health Services Technology Assessment Texts (HSTAT) <https://www.ncbi.nlm.nih.gov/books/NBK16710/>; ADA Center for Evidence-Based Dentistry <http://ebd.ada.org/en/evidence/guidelines>; American Academy of Pediatric Dentistry Oral Health Policies and Clinical Practice Guidelines <http://www.aapd.org/policies/>; Scottish Intercollegiate Guidelines Network (SIGN), Healthcare Improvement Scotland <http://www.sign.ac.uk/>; and National Institute for Health and Care Excellence (NICE), National Health Service, UK <https://www.nice.org.uk/About/What-we-do/Our-Programmes/NICE-guidance/NICE-guidelines>.

### Criteria for Inclusions and Exclusions

We limited our review of practices and guidelines to those pertaining to the United States and published in English since 2000 up to August 2017. We allowed baseline information from intervention studies to be included but otherwise research or intervention studies were excluded. We also focused on provider reports of clinical services provided rather than public reports via surveys or qualitative studies of services obtained during care. Clinical preventive services were considered to represent integration of medicine and dentistry if they identified risk factors for disease and perhaps the disease itself, but the clinician assessing risk would not provide treatment for the condition because it was beyond the training or scope of practice for that

provider type. In other words, screening for detection of disease was included in the review if the disease identified in their screening would have to be referred for treatment. As an example, a physician could screen for dental caries, but would not provide comprehensive care for the condition.

Guidelines, consensus statements and best practice recommendations were included only if the development process was sponsored by an official organization. We excluded guidelines for conditions such as systemic sclerosis (Baron et al., 2010) or juvenile idiopathic arthritis (Stoustrup et al., 2017) typically requiring referral to a specialist rather than primary care. We also did not consider guidelines and consensus statements focused primarily on the medical management of patients for the provision of dental care (e.g., hypertension, hepatitis, renal disease, or tuberculosis). Medical considerations frequently arise in the provision of dental care, and best practice guidelines exist (Siegal, 2013). Although they require collaboration between the dentist and physician, we excluded them because the focus of these documents is usually on management of the condition during dental care, not identifying non-dental conditions.

## RESULTS

### Preventive Oral Health Services (POHS) Provided by Physicians

We found 24 studies reporting physicians' integration of preventive oral health services into clinical practice (Table 2-1). The largest number of surveys were of primary care physicians providing POHS for pediatric patients (n=11), followed by oral and pharyngeal cancer (n=6), pregnant women (n=4), and chronic diseases (diabetes n=1, cardiovascular disease n=1, non-specified n=1).

All but two of the pediatric provider surveys were state level surveys. One of the two national surveys (Quiñonez et al., 2014) reported that 29% of respondents conducted risk assessments with greater than 75% of their patients. Findings on this practice and screening for obvious decay from other surveys was highly variable however, ranging from 35% to 99%. Screening also was much lower for early signs of dental caries (Ismail et al., 2003). More than two-thirds of survey respondents reported counseling parents on diet, but other oral health topics such as dental visits were included less frequently. Referral practices also were highly variable, with a range from 7% to 94%. Provision of fluoride varnish was included in four surveys and found to be low, with a range from 1% to 30%. The national survey by Quiñonez et al. (2014) reported a rate of 7%.

Four surveys of providers of care for pregnant women were found in the search. Surveys reported clinical screenings of the mouth, counseling on oral health topics and dentist referrals.



In a national survey (Morgan et al., 2009), 54% of providers reported conducting a dental screening for pregnant patients, not too different from the other surveys (32%, 29%, 51%). Results of one survey (Wilder et al., 2007) suggest that screening is performed mostly when the patient reports a problem. Only one of the surveys (Morgan et al., 2009) reported counseling on oral health topics and found that 46% report discussing oral health. Survey questions inquiring about referral vary in how they are asked and responses likewise vary. In the national survey (Morgan et al., 2009), 33% of obstetricians and gynecologists advise all pregnant patients to get dental care.

Generally, the six available surveys on oral cancer practices reveal low percentages of respondents reporting conducting routine examinations. The exception to this conclusion is the survey that sampled FQHC providers (Sohn et al., 2005), in which 71% reported screening as part of the routine physical examination. Assessment of risk factors is performed at a higher rate than examinations. Canto et al. (2002) found that 77% of family physicians asked about 8 risk factors; Patton et al. (2006) found that greater than 90% of family physicians and nurse practitioners ask about tobacco habits, alcohol habits and cancer histories; and Reed et al. (2010) found that 92% of physicians in South Carolina ask about smoking more than half the time. Based on the two surveys that assessed referral practices, it appears that physicians under-refer patients with suspicious lesions (Sohn et al., 2005; Shimpi et al., 2016). For example, Sohn et al. (2005) found that 66% of providers in Michigan FQHCs had referred a patient with a suspicious lesion in the last 12 months.

The last three surveys found in the search include medical providers in a large healthcare system in Wisconsin (Shimpi et al., 2016), endocrinologists and internists in North Carolina (Owens et al., 2011), and obstetricians in North Carolina (Mosley et al., 2015). Findings from these studies suggest low rates for oral examinations and dental referral. Owens et al. (2011) report that only 23% of endocrinologists and internists in NC have oral health educational materials in their office.

### Preventive Health Services (PHS) Provided by Dentists

The number of studies on the integration of preventive health services into dentists' practices is smaller than for the integration of POHS into physicians' practices (Table 2-2). Our search found only 8 publications from 7 surveys, all focused on chronic conditions and their risk factors. Most respondents report including questions on diabetes in their medical histories. However, most do not assess height, weight, or provide in-office testing of blood glucose levels. With the exception of the survey by Sajnani-Oommen et al. (2006) in which 71% reported offering nutritional counseling, only about one-third or fewer of respondents offer their patients nutrition, tobacco cessation and weight-related counseling. Small percentages report referring for glucose testing, nutrition counseling, or other services of medical or weight control specialists.

## Clinical Practice Guidelines Related to Integration of POHS into Primary Care

The results of our search for clinical guidelines resulted in the identification of 19 guidelines and consensus statements targeted to the medical workforce (Table 2-3). They include recommendations in pediatrics (n=5), maternal and child health (n=5), cardiovascular disease (n=1), diabetes mellitus (n=5), and oral cancer (n=3).

The American Academy of Pediatrics (AAP) policy statements on oral health (AAP, 2014) and clinical reports (AAP, 2014) clearly support physicians' provision of comprehensive preventive oral health services as part of the well-child visit. Recommended services include caries risk assessments, clinical screening, counseling on risk factors and protective practices, in-office preventive therapies (fluoride varnish and supplements), and referral to a dental home. These POHS are similar to those recommended in AAP/Bright Futures periodicity schedule, which are followed by Medicaid programs and federal agencies. The US Preventive Services Task Force (2014) and the American Academy of Family Physicians (2017) support a more limited scope of practice based on the evidence of safety and effectiveness. They recommend prescribing fluoride supplementation when drinking water is deficient of fluoride and in-office applications of fluoride varnish to the teeth of all children 0-5 years of age as soon as the first tooth erupts. Routine screening was judged by the USPSTF to have insufficient evidence to support a recommendation. Three of the guidelines for pregnant women discussed in the following paragraph also include recommendations for pediatric providers (California Dental Association Foundation, 2010; Massachusetts Department of Public Health, 2016; New York Department of Public Health, 2006).

The five guidelines for pregnancy (and early childhood in some cases) were developed by a national consensus conference (National Maternal & Child Health Oral Health Resource Center, 2012), a committee consensus of the American College of Obstetricians and Gynecologists (2013), and consensus statements based on expert opinion from the state health departments in two states (MA Department of Public Health, 2016; NY Department of Public Health, 2006) and one state-level professional organization (CA Dental Association Foundation, 2010). POHS recommended for pregnant women include education, particularly on topics related to pregnancy, such as the association of oral and systemic health, and the importance and safety of dental care during pregnancy; an assessment of oral health status; and a referral to a dentist when needed. The five guidelines are consistent in their recommendation that the provider perform a clinical assessment of patients' oral health status and arrange a referral as appropriate.

Our search identified five guidelines providing recommendations for physicians about how to care for the oral health needs of patients with diabetes. The American Diabetes Association (2017) lists periodontal disease as a comorbidity for diabetes and recommends that physicians

consider screening patients for this dental condition. It further considers an assessment for periodontal disease as a component of a comprehensive diabetes evaluation. The emphasis in these guidelines and others, however, is on the need for a comprehensive oral health evaluation by a dentist who should be part of the medical team caring for the diabetic patient. All guidelines recommend that diabetic patients be referred to a dentist, with urgent symptoms requiring an immediate referral. All five guidelines recognize the importance of patient education, particularly about the bidirectional effects of diabetes and oral health on each other.

The final four guidelines listed in Table 2-3 provide evidence-based recommendations on screening by primary care physicians for periodontal disease in adults asymptomatic for cardiovascular disease and for oral cancer. The USPSTF concluded that there is insufficient evidence in either case to support screening by primary care clinicians for periodontal disease (USPSTF, 2009) or oral cancer (USPSTF, 2014). The AAFP (2017) has made the same recommendation as the USPSTF for oral cancer screening. The American Cancer Society (2016) recommends that adults should have their mouths and throats examined by a doctor as part of a routine cancer-related checkup.

#### Clinical Practice Guidelines Related to Integration of PHS into Dental Care

Our search for clinical guidelines targeting PHS for dental professionals yielded only two publications that met our inclusion criteria (not presented in tabular format because of the small number of studies). Both highlight an important role for the dental team in the integration of medical and dental care for hypertensive and diabetic patients. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (Chobanian et al., 2003) is the first of the two documents. A recent update (James et al., 2014) of these guidelines is available, but it focuses narrowly on evidence for hypertension treatment, and those portions of the JNC7 pertaining to dentists are still considered to be in effect. JNC7 stresses that dentists and other members of the dental team need to be involved in the detection and management of hypertension. Dentists are encouraged to screen for undetected hypertension or hypertension that is not controlled and refer for evaluation by a physician.

The other document meeting our inclusion criteria is the consensus report from the Joint EFP/AAP Workshop on Periodontitis and Systemic Diseases (Chappel & Genco, 2013). These guidelines provide specific counseling recommendations for dental patients with diabetes. They also recommend that undiagnosed diabetic patients with risk factors for type 2 diabetes and signs of periodontitis be informed about their risk for diabetes, assessed for HbA1C levels with chair-side tests, and referred to a physician for follow-up care.

## DISCUSSION

This review of the integration of non-traditional clinical preventive services by dentists and physicians into their practices and related practice guidelines supports three conclusions of general interest and of specific importance to the aims of the overall project.

First, practice surveys, particularly when considered as a whole, identify a broad scope of integrated clinical practices that includes risk assessment, clinical screening/ testing and interventions by way of referrals, counseling and in the case of children, fluoride therapies, for a number of populations. However, diseases and conditions to which these services are applied are limited. Practices of physicians address dental caries, periodontal diseases, and oral cancers in maternal and child health and adult patients. Reported practices of dentists concern diabetes, obesity and cardiovascular diseases.

Nevertheless, the scope of current practice for physicians and dentists is somewhat uncertain for several reasons. We found only a small-to-modest amount of literature on physicians' provision of preventive oral health services or dentists' provision of preventive health services. The number of studies for physicians' practices is small (n=24), even smaller for dentists (n=8). The number and types of POHS or PHS services also vary considerably within and across disease conditions, creating a large amount of variation in practice patterns. Pediatric POHS are best-defined, which is reflected in the number of surveys for pediatric care providers (Hagan et al., 2017; AAP, 2014; Clark & Slayton, 2014). Although relatively small, the number of pediatric surveys is 10-fold greater (n=11) than for patients with either diabetes (n=1) or cardiovascular disease (n=1).

The published studies included in our review have a number of limitations that lead to the need for further caution in interpretation of the scope of POHS or PHS currently being provided in medical and dental practices. We limited our review to surveys of providers, which were mostly cross-sectional, mail surveys of respondents selected from a state-level sample frame of providers of different types. Our identification of integrated clinical services being provided is influenced by the questions that investigators chose to include in their surveys. In the absence of widely-accepted practice guidelines or best practices, the items and how they are asked can vary considerably from survey to survey.

More importantly, our definition of integration practices as well as inclusion criteria could have led to an underestimation of the number of available guidelines for physicians and dentists. For some provider types and some services, progress is being made in defining services and supporting their integration (Hagan et al, 2017; Hummel et al., 2015). The Oral Health Delivery Framework and its associated implementation guide with supporting tools and resources are examples of efforts to help facilitate integration of oral health services into primary care

(Hummel et al., 2015; Qualis Health, 2015) . The Framework provides clear descriptions of actions primary care teams can take to integrate oral health services into primary care (ask, look, decide, act, document). Even with these advances, integration services specific for most diseases have not been specified clearly. Nor is sufficient evidence of effectiveness of clinical integration activities available to develop evidence-based guidelines for most conditions.

The second conclusion from our review is that, even though highly variable, the provision of POHS and PHS generally are infrequent, indicating a low degree of integration for most POHS or PHS into current medical and dental practice. The percentage of providers reporting some services for pediatric patients is larger than for adult patients, particularly for counseling for common risk factors like diet and sugar-containing beverages (Nelson et al., 2015). Even for fluoride varnish application and prescription of fluoride supplements, the only POHS recommended by the USPSTF or similar body, rates are either not reported in the case of supplements or are less than 10% for fluoride varnish application based on a national survey of pediatricians included in our review (Quiñonez et al., 2014). Another national study not included in our review using Medicaid payment data reported by states to CMS found fluoride varnish rates of 4% per state per year for 2010 to 2013 (Arthur & Rozier, 2016).

Our third conclusion, which is based on the small number of guidelines and official consensus statements identified in the search, is that the evidence in support of integration of POHS and PHS into clinical practice is not plentiful. We identified 19 guideline statements for POHS, five each for pediatrics, maternal and child health, and diabetes, three for oral cancer and 1 for heart disease. Only prevention of dental caries in children and screening for oral cancer have had comprehensive evidence-based reviews with graded recommendations, both done by the USPSTF. Most other guidelines and consensus statements are authored by expert panels, some with evidence reviews, others without. The review of dental caries prevention included screening, risk assessment, counseling, referral and fluoride therapies. Only fluoride supplements and fluoride varnish were found by the UPSTF to have sufficient evidence to recommend them. Most evidence in support of other services like screening and referral is observational (Beil and Rozier, 2011) and thus does not meet the criteria for inclusion by the USPSTF. The Task Force also concluded that insufficient evidence exists to recommend that primary care physicians screen for oral cancer in asymptomatic adults.

We found only two guidelines for PHS provided by dentists who met our inclusion criteria (Chobanian et al., 2003; Chappel & Genco, 2013). This finding reflects in part the early stages of experimentation with different implementation models in dental practice. However, this finding also likely reflects the selection criteria used for our guideline searches and reviews. Other publications using a broader definition of integrated services or different selection criteria found a larger number of studies than included in our review (Sanghari and Siddiqui 2017).

Application of our selection criteria to guidelines for hypertension and tobacco cessation counseling provide good comparative examples of the results of application of our selection criteria. Hypertension screening met our criteria for inclusion (Chobanian et al. 2013; Herman et al., 2004). Routine measurement of blood pressure is an important part of dental care and can help reduce the risks of cardiovascular events and acute complications during dental treatment (ADA, 2017). It also can identify undetected or uncontrolled hypertension in patients, who then need to be referred for follow-up in primary medical care. The dentist cannot make a diagnosis of hypertension and decide on its treatment, so referral is necessary. This rather new and broader purpose of blood pressure assessments on all adult patients fits with the integration model in which the provider screens for conditions that must be referred for diagnosis and treatment because it doesn't fall within their scope of practice.

We found guidelines for smoking cessation for the dental team and studies reporting smoking cessation practices, but we did not include them in our review (Fiore et al., 2008). Smoking cessation guidelines recommend the involvement of all clinicians in smoking cessation. Dental professionals should identify patients who smoke, advise them to quit, and offer them information about cessation treatment (ADA, 2017). Evidence-based guidelines published by the U.S. Department of Health and Human Services and the Agency for Healthcare Research and Quality recommend a 5-step process called the “5As” (ask, advise, access, assist, arrange) for health-care professionals to use when engaging patients who are dependent on nicotine.” (Fiore et al., 2008) The dental team can, and usually does, implement these guidelines without any direct coordination or collaboration with primary care. Guidelines recommend patient referral to community resources like phone quitlines, support groups and education materials, but not directly to primary care for smoking cessation. We did not include smoking cessation guidelines and practice studies in our review because they do not involve integration or tobacco cessation activities and care with primary medical care.

A strong biological and public health case has been made for the integration of PHS services into dental practice as a way to help address the high prevalence of cardiovascular diseases, diabetes and other undetected diseases. Biological and epidemiological studies report an association between dental disease and medical conditions (Monsarrat et al., 2016). A growing number of opinion papers call for in-office tests like HBA1c, HIV, and HPV (Giddon et al., 2013; Fried, 2014; Greenberg et al., 2017). It is argued that providing chairside testing for chronic conditions can increase access to services among those supposedly healthy individuals who have a dental visit but no regular contact with medical care, which was estimated nationally to be close to 13 million people in 2008 (Strauss et al., 2012; Greenberg and Glick, 2012). Feasibility and acceptability studies support offering tests for medical conditions in the dental office (Barasch et al., 2013; Pollack et al., 2014). Patients, dental providers and physicians generally are supportive of chairside testing for medical conditions (Kalladka et al., 2014; Greenberg et al., 2012; Greenberg et al., 2015; Greenberg et al., 2016).

A 2010 law in New York requires dentists to offer HIV testing as a routine part of health care to all persons age 13-64 years of age (New York State Department of Health, 2012). The New Jersey State Board of Dentistry ruled that dentists in New Jersey can screen at-risk patients for diabetes, and although A1c testing is within the scope of licensure in the state, it is not presumed to be the standard of care (Delta Dental of New Jersey and Connecticut, 2015).

Given the potential for integration of PHS into dental practice, it is encouraging to see an increase in interest and research into its feasibility and acceptability. Some agencies, advocates and researchers are pushing forward with the integration of PHS into dental practice, yet this is not the standard of care. Dentistry is at a crossroads. It will need to decide on its role in caring for the overall health of the public and its goal for integration with primary care. Moving forward with integration will require continued investments into biological research on dental and systemic disease connections, but also research on dissemination and implementation as studies document the feasibility and acceptability of different interventions. Dentists also need training during dental school to develop knowledge, skills and competencies in integration of oral health into primary care.

Noticeable among the gaps in knowledge are consensus guidelines for dentists providing PHS and their effectiveness in clinical practice. We found only two guidelines with recommendations for dentists provision of PHS. Most guidelines for the prevention and treatment of conditions included in our review only generally mention dentists as part of the professional workforce without any specific guidance on actions they should take in providing PHS in their clinical practices. For example, the Standards of Care Recommendations from the American Diabetes Association highlights the importance of having dentists as part of a team of health care providers, but does not mention any specific integration activities in which they should engage (ADA, 2017).

Also noticeable among the gaps in knowledge is the lack of evidence for interventions that might be effective in increasing rates of PHS delivery and their quality. The Cochrane Collaboration has reviewed the evidence for the impact of practice-based interventions designed to improve interprofessional collaboration among health care professionals and concluded that “...there is not sufficient evidence to draw clear conclusions on the effects of interprofessional collaborative practice interventions.” (Reeves et al., 2017).

Finally, mention of health literacy practices is generally lacking in the practice surveys and guidelines. None of the studies specifically reviewed the role of health literacy or oral health literacy in these integration efforts. One acknowledged the potential for poor communication, however. Only 38% of dentists and 39% of obstetricians agreed that good communication exists between health care professionals about dental care during pregnancy (Strafford et al., 2008).

Future research should take the opportunity to include health literacy practices in surveys of integration of POHS or PHS clinical practices.



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**TABLE 2-1** Studies Reporting Physicians' Integration of Preventive Oral Health Services into Clinical Practice

Study	Design	Condition or Population	Practices & Degree of Integration
<b>Pediatrics</b>			
Ismail et al., 2003	Cross-sectional national survey of representative sample of family physicians and pediatricians selected from the AMA Masterfile, 2000	Dental caries status of 2, 12-month-old vignettes	Screen for obvious caries=91% pediatricians, 77% family physicians; Screen for early signs=33% pediatricians, 19% family physicians; Recommend referral for high risk>90%; low risk=14% pediatricians, 19% family physicians
Lewis et al., 2004	Cross-sectional survey of all general pediatricians in WA state listed in AMA Master File.	Pediatrics	Provide counseling on oral health topics=81%
dela Cruz et al., 2004	Baseline survey of PCP in pediatric & family medicine practices enrolled in RCT in NC	Pediatrics	Examine teeth for signs of decay=99%; Risk assessment=86%; Refer infants & toddlers=94%
Brickhouse et al., 2008	Cross-sectional survey of random sample of VA pediatricians	Infants	Examine for dental decay=95%; counsel on diet=98%; Recommend age $\leq 2$ yr dental visit=22%
Herndon, et al., 2010	Cross-sectional, baseline survey of FI AAFP & PS members providing well-child care for 0-4 yr olds, 2008	Pediatrics	Counsel about dental visits <1 yr=14%; Screen for decay=81%; access risk for ECC=56%
Ditto et al., 2010	Cross-sectional survey of all active pediatrician members of IN State Medical Association, 2008	Pediatrics	Examine child's teeth=87%; Counsel on diet=66%; Counsel on dentist visit=93%; inquire about mother's oral health=15%; recommend age 1 dental visit=16%
O'Callaghan & Douglass, 2013	Cross-sectional survey of CT PCP trained to provide POHS, 2010	Infants	Screening=75%; Referral=7%; Fluoride varnish=30%
Quinonez et al., 2014	Cross-sectional national survey of random sample of AAP membership, 2012	0-3 yrs of age	With >75% of patients: Risk assessment=29%; Counsel on child diet and brushing >97%; Counsel on mothers oral health=6%; FV=7%

Hinz et al., 2014	Cross-sectional survey of random sample of AAP members in TX & OH, 2009	Pediatrics	Regularly refer 1-yr old=40%
Weatherspoon et al., 2015	Cross-sectional survey of random sample of MD family physicians and pediatricians	Dental caries	Caries prevention education=35% family physicians, 45% pediatricians; Caries risk assessment=51% family physicians, 52% pediatricians; Fluoride varnish=9% family physicians, 12% pediatricians
Veschusio et al., 2016	Panel of SC Medicaid enrolled children <48 mo of age created from claims, 2008-2013	<48 months	FV rate=1% per child per year

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### Patients of all ages

Shimpi et al., 2016	Cross-sectional survey of multispecialty physicians, residents and nurses in Marchfield Clinic Health System, WI, 2014	Primary & specialty care for all ages.	Perform oral exams=71% of PCPs, 36% of SCs; Conclusion: "...lack of oral health treatment & infrequent referral to dental providers."
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### Periodontal and Systemic Diseases

Owens et al., 2011	Cross-sectional survey of all endocrinologists and random sample of internists in NC.	Periodontal disease & diabetes	Dental screenings as part of diabetic services=5%; Oral exam on patients with diabetes rarely or when problem=57%; Oral health education materials in office=23%.
Mosley et al., 2015	Cross-sectional mail survey of all active non-pediatric cardiologists (n=625) in NC, 2012-13.	Periodontal disease & cardiovascular disease	Exam: Never=21%, rarely=46%, initial visit=18%; Refer when concerns=41%; Refer if something needs further investigation=31%; Never refer=22%

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### Pregnancy

Wilder et al., 2007	Cross-sectional survey of all obstetricians in 5 NC counties	Pregnancy & periododontal disease	Exam: Rarely/ never look in mouth=49%; Exam=22% at initial visit, 10% periodically, 54% when problem; Recommend dentist exam=51%;
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Strafford et al., 2008	Cross-sectional survey of convenience sample of patients & random sample of providers (dentists, obstetricians) in OH, Oct 2004-July 2005.	Pregnant women	Include oral health evaluation in care plan=49%; Perform oral exam=29%; Use oral health screening questions=20%; Refer all patients=6%. "Only 38% of dentists and 39% of obstetricians agreed there was good communication between health care professionals with regard to dental care during pregnancy."
Morgan et al., 2009	Cross-sectional national survey of a stratified random sample of ACOG Fellows (obstetrician-gynecologists).	Pregnant women	Discuss oral health=46%; Routinely provide pregnant patients with oral health information=31%; advise all pregnant patients to get dental care=33%; ask pregnant patients if they have visited a dentist=27%; Dental exam as part of prenatal care=54%.
Wooten et al., 2011	Cross-section survey of random sample nurse practitioners and certified nurse midwives obtained from NC Medical Board	Pregnant women	Dental screening=32%; Referral for dental care in last 12 months=86%.

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### Oral Cancer

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McCunniff et al., 2000	Convenience sample of primary care physicians	Oral & pharyngeal cancer	Exam for all patients=7%.
Canto et al., 2002	Cross-sectional survey of all members of MD Academy of Family Physicians, 1999.	Oral cancer	Risk assessment: 77% asked about 8 risks; Exam: 15% for all patients $\geq 40$ yrs at initial exam, 10% at recall, 43% palpate all patients $\geq 18$ yrs.
Sohn et al., 2005	Cross-sectional survey of all primary care physicians employed by MI FQHCs, 2003	Oral cancer	Screen during routine physical exam=71%; Referred patient with suspicious lesion in last 12 mo=66%.
Patton et al., 2006	Cross-sectional surveys of random sample of NC dentists, hygienists, family physicians, nurse practitioners, 2002-03	Oral & pharyngeal cancer	Assess risk factors: >90% of family physicians & nurse practitioners ask about past & present tobacco habits, alcohol habits, cancer history.

Reed et al., 2010	Cross-sectional mail survey of random samples of SC dentists & some physicians (internal medicine, family practice, otolaryngology, peditatrics), 2006.	Oral & pharyngeal cancer	Exam > half time=13%; Ask about smoking > half time=92%; Counsel > half the time=83%.
Shimpi et al., 2016	Cross-sectional survey of all PCPs (physicians, nurse practitioners, nurse, physician assistant) in primary care within MC Health Systems (Marshfield), 2015.	Oral cancer	Do not screen all patients=78%; Refer frequently patients with suspicious lesions=54% - 62% by yrs experience.

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Papers published 2000 and later.

PCP=Primary Care Provider

SCP=Speciality Care Provider

**TABLE 2-2** Studies Reporting Dentists' Integration of Preventive Health Services into Clinical Practice

Study	Design	Condition or Population	Practices & Degree of Integration
Kunzel et al., 2006	Cross-sectional mail survey to active periodontists and GPs in NE US selected from membership of dental societies, 2002.	Smoking & diabetes	General dentists responses only. For all patients, always record smoking information in chart=31%; For all patients who smoke, access interest in quitting=14%; advise to quit=24%; Assist often by setting quit data=2%; Refer to clinic/program=2%. Routinely ask new patients if have diabetes, under physician care, taking medications>95%; For diabetic patients ask type, complications, glucose control regimen~50%; Refer for/monitor glucose level=14%; Communicate with physician=14%; Discuss implications, medications, periodontal disease & glycemic control~60%
Sajnani-Oommen et al., 2006.	Cross-sectional mail survey of random sample of (n=500) US members of AAPD, 2003-2004.	Nutritional counseling	Routinely offer nutritional counseling=71%; Advise patient to keep food diary=9%; Refer to nutritionist=19%
Braithwaite et al., 2008.	Cross-sectional mail survey of all active pediatric dentists in NC., 2006.	Nutritional counseling	Do <b>not</b> document weight routinely=67%; Do <b>not</b> document height routinely=94%; Provide nutrition counseling=24%; Never referred for weight management services=81%
Esmeili et al., 2010.	Cross-sectional mail survey of 2,174 randomly selected Delta Dental providers in CA, WV, PA	Diabetes	Document diabetic condition (often/ almost always)=93%; Perform in-office blood glucose measures on diabetic patients=4%; Consult with physician before treatment=22%; Advise about periodontal disease risk=86%; Provide written education materials=27%; Providing services for diabetics=18%
Curran et al., 2010.	Mail, cross-section national survey of random sample 8,000 (GD=3,826; PD=4,174) active dentists from ADA membership list, 2008-2009.	Obesity	Offer weight-related screening or counseling services=4.8%; Among these: Distribute pamphlets in waiting room=0.5%; Dentist initiates brief discussion=1.6%; Referral to medical specialist=0.5%

Efurd et al., 2012.	Electronic cross-sectional survey of convenience sample (n=1,819) of GDs, periodontists, dental hygienists with current email addresses in AK	Diabetes	Dentists only: Inquire about diabetes=89.2%; Current HbA1C=10.8%; Never engage in chairside testing=84.9%; Always use in-office glucometer=1%
Lee et al., 2012.	Mail, cross-sectional national survey of random sample (n=4,154) of pediatric dentists, 2008-2009. [Same study as Curran et al. 2010]	Obesity	Weight-related counseling by dentist=9%; Brief discussion=5%; Referral to medical specialists=3%
Wilder et al., 2014.	Mail, cross-sectional survey of random sample (n=1,350) of licensed dentists in NC, 2009-2010.	Risks for systemic conditions like cardiovascular disease, diabetes, obesity	Assess blood pressure=85.5%; Record diabetic patients' blood sugar=7.8%. Discuss tobacco use=43%; blood pressure=24.9%; alcohol use=23.9%; pulse=17.4%; BMI=3.2%; physical activity=2.5%; cholesterol=1.8%. Extremely likely/likely to: call physician to coordinate treatment=72%; offer nutritional counseling=38.4%; tobacco cessation counseling=38.6%; refer to out-of-office cessation services=39.2%; counsel obese patients=21.3%; refer for fasting glucose test=34.2; use in-office glucose monitor=1.3%

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Papers published 2000 and later.

**TABLE 2-3** Guidelines and Consensus Statements on Physicians and other Non-Dental Primary Health Care Professionals Providing Preventive Oral Health Services.

Agency & reference	Targeted provider	Targeted population	Method of Development	Recommended Oral Health Services
<b>Pediatric Primary Care</b>				
AAP Policy Statement (2014)	Pediatric primary care providers	Children	AAP Section on Oral Health committee consensus	<ul style="list-style-type: none"> <li>• Oral health risk assessment</li> <li>• Anticipatory guidance as part of comprehensive counseling</li> <li>• Counseling reduction in sugar exposures</li> <li>• Encourage brushing with fluoride toothpaste</li> <li>• Follow fluoride recommendations</li> <li>• Maintain collaborative relationships with local dentists</li> <li>• Recommend dental home by 1 yr for all infants</li> </ul>
AAP Clinical Report (Clark & Slayton, 2014)	Pediatric primary care providers	Children	AAP Section on Oral Health committee report	<ul style="list-style-type: none"> <li>• Oral health risk assessment on all children starting at 6 mo</li> <li>• Determine need for topical or systemic fluoride supplements</li> <li>• Understand need for fluoride varnish &amp; how to provide it</li> <li>• Advocate for water fluoridation in local community</li> </ul>
US Preventive Services Task Force. (Moyer, 2014)	Pediatric primary care providers	0-5 yrs	Systematic review of evidence for effectiveness for screening, risk assessment, referral, counseling, fluoride therapies; committee grading of evidence	<ul style="list-style-type: none"> <li>• Fluoride supplement @ 6 mo – 16 yrs</li> <li>• Fluoride varnish all children starting with tooth eruption</li> </ul>
AAP/ Bright Futures. (Hagan et al., 2017)	Pediatric primary care providers	0-6 yrs	Committee consensus	<ul style="list-style-type: none"> <li>• Assess for dental home</li> <li>• Risk assessment if no home</li> <li>• Recommend brushing with fluoride toothpaste</li> <li>• Fluoride varnish at 3-6 months</li> <li>• Fluoride supplements</li> </ul>
American Academy of Family Physicians, 2017.	Primary care physicians	0-5 yrs	Commission on Health of the Public and Science (CHPS) critically reviews recommendations released by the USPSTF and makes recommendations to the AAFP Board of Directors.	<ul style="list-style-type: none"> <li>• Prescribe oral fluoride supplementation starting at age 6 months for children whose water supply is deficient in fluoride</li> <li>• Apply fluoride varnish to the primary teeth of all infants and children starting at the age of primary tooth eruption</li> <li>• Evidence is insufficient to assess the balance of benefits &amp; harms of routine screening for dental caries performed by primary care clinicians</li> </ul>
<b>Pregnant Women</b>				
New York Department of	Prenatal, oral health care, &	Pregnancy & early	Opinion of expert panel	Prenatal care providers should: <ul style="list-style-type: none"> <li>• Assess oral health problems, make referral &amp;</li> </ul>

Public Health, 2006.	child health professionals	childhood		document <ul style="list-style-type: none"> <li>• Provide written consultation for dentist</li> <li>• Develop list of dentists</li> <li>• Encourage dentist visit if without last 6 mo</li> <li>• Encourage adherence to dentist advice</li> <li>• Counseling on caries prevention strategies in women with nausea &amp; vomiting</li> </ul> <p>Child health professional should:</p> <ul style="list-style-type: none"> <li>• Assess caries risk in child, including clinical findings</li> <li>• Facilitate referral if risk or lesions</li> <li>• Assist establishing dental home</li> <li>• Educate about risk reduction in child</li> <li>• Educate about risk reduction in mother</li> </ul>
California Dental Association Foundation, 2010	All health professionals, but we focus on prenatal.	Pregnancy & early childhood	Expert consensus from committee and consensus conference	<ul style="list-style-type: none"> <li>• Provide education</li> <li>• Inform dental care is safe</li> <li>• Determine if have dental home &amp; need for referral</li> <li>• Maintain list of dentists</li> <li>• Conduct &amp; document oral assessment</li> <li>• Share clinical information with dentist</li> <li>• Provide advice for frequent nausea</li> <li>• Educate about caries risk in children</li> </ul>
National Maternal & Child Oral Health Resource Center, 2012	Prenatal health care providers	Pregnant women	Consensus statement of expert workgroup convened by HRSA, BMCH	<ul style="list-style-type: none"> <li>• Assess oral health status (risk and clinical) &amp; document findings</li> <li>• Advise about use of oral health care</li> <li>• Collaborate with oral health professionals with formal referral process</li> <li>• Provide case management support services</li> <li>• Improve health services in community (e.g., establish partnerships with programs like WIC; provide culturally &amp; linguistically appropriate care)</li> </ul>
American College of Obstetricians & Gynecologists, 2013	Obstetricians & gynecologists	Pregnant women	Consensus of Committee for Healthcare for underserved women	<ul style="list-style-type: none"> <li>• Discuss oral health with all patients &amp; advise about linkage with general health</li> <li>• Assess oral health</li> <li>• Reassure that dental care is safe</li> <li>• Inform women on conditions that require immediate attention</li> <li>• Be aware of dental coverage and refer with written note or phone call</li> <li>• Advocate for insurance coverage during and after pregnancy</li> <li>• Reinforce routine oral health maintenance</li> </ul>
Massachusetts Department of Public Health. 2016.	Providers for pregnant women, pediatric patients	Pregnancy & early childhood	Expert opinion of Oral Health Advisory Committee	<p>Prenatal healthcare providers should:</p> <ul style="list-style-type: none"> <li>• Assess oral health status</li> <li>• Advise &amp; educate</li> <li>• Refer &amp; collaborate</li> </ul>



Pediatric providers should:

- Assess oral health status with risk assessment & screening
- Advise & educate about risks & interventions, including providing fluoride varnish & supplements
- Refer & collaborate with dentists

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**Coronary Heart Disease**

U.S. Preventive Services Task Force, 2009.	Primary care clinicians	Asymptomatic men & women with no history of CVD	Systematic review of evidence for effectiveness like C-reactive protein, ankle-brachial index & periodontal disease; committee grading of evidence	Insufficient evidence to assess harms and benefits of clinical screening for periodontal disease to prevent CHD events
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**Diabetes**

International Diabetes Federation (IDF) Task Force on Clinical Guidelines, 2009.	Diabetes healthcare (non-dental) professionals treating patients with diabetes	People with diabetes	IDF Task Force on Clinical Guidelines reviewed results of literature searches and document drafted by writer.	<p>Recommendations for people with diabetes:</p> <ul style="list-style-type: none"> <li>• Ask whether patient follows daily oral hygiene regimen &amp; sees dental professional regularly</li> <li>• Ask about symptoms of gum disease.</li> <li>• For those with inadequate oral hygiene, remind them that this is a normal part of diabetes self-management, &amp; advise as needed. Advise about the importance of regular dental check-ups, if needed &amp; access permits</li> <li>• Refer people with possible symptoms of gum disease to a dental health professional</li> <li>• Educate people with diabetes about diabetes and oral health implications, particularly for poorly controlled diabetes</li> </ul>
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Consideration: The Guideline Group recognized that the evidence on diabetes and periodontal diseases was of variable quality, and that more research was clearly required. At present the level of evidence does not allow a conclusion either that specific surveillance programs for periodontal disease should be instituted in people with diabetes, or that periodontal diseases should be managed any more actively in people with diabetes for specific immediate or long-term gain. Nevertheless, it was noted that warning symptoms of periodontal diseases were easily ascertained by non-dental professionals, that people with diabetes already had annual review of health and complications, and that guidelines for the general population already covered daily oral hygiene and regular professional dental checks.

Diabetes Coalition of California and	Primary care providers	Patients with diabetes	Committee	<ul style="list-style-type: none"> <li>• Advise dental exam at least twice yearly. Assess oral symptoms that require an urgent referral</li> </ul>
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California Diabetes Program, 2012				<ul style="list-style-type: none"> <li>• Refer all patients with diabetes for a dental examination as a component of the comprehensive diabetes evaluation, regardless of oral findings or complaints</li> </ul>
Diabetes Coalition of California and California Diabetes Program, 2012	Primary care providers	Patients with diabetes	Committee	<ul style="list-style-type: none"> <li>• Advise dental exam at least twice yearly. Assess oral symptoms that require an urgent referral</li> <li>• Refer all patients with diabetes for a dental examination as a component of the comprehensive diabetes evaluation, regardless of oral findings or complaints</li> </ul>
Health Care for the Homeless (HCH) Clinician's Network. (Kalinowski et al., 2013)	Providers who care for homeless with diabetes	Homeless adults with diabetes	Authors' adaptation of ADA 2013 Standards of Medical Care in Diabetes	<ul style="list-style-type: none"> <li>• Provide toothbrushes, toothpaste &amp; dental floss</li> <li>• Teach basic oral health care &amp; importance of an annual oral exam</li> <li>• Refer to dentist for annual exam when possible</li> <li>• Other recommendations of ADA</li> </ul>
European Federation of Periodontology & American Academy of Periodontology (Chappel & Genco, 2013)	Physicians & other medical health professionals	Diabetic patients	Proceeding of joint workshop & consensus of EFP & AAP work group	<p>Because of the increased risk for developing periodontitis in patients with diabetes the following recommendations are made:</p> <ul style="list-style-type: none"> <li>• Patients with diabetes should be told that periodontal disease risk is increased by diabetes. They should also be told that if they suffer from periodontal disease, their glycaemic control may be more difficult, &amp; they are at higher risk for diabetic complications such as cardiovascular &amp; kidney disease</li> <li>• As part of their initial evaluation, patients with type 1, type 2 and gestational diabetes (GDM) should receive a thorough oral examination, which includes a comprehensive periodontal examination</li> <li>• For all newly diagnosed type 1 &amp; type 2 diabetes patients, subsequent periodontal examinations should occur (as directed by the dental professionals) as part of their ongoing management of diabetes. Even if no periodontitis is diagnosed initially, annual periodontal review is recommended</li> <li>• Diabetes patients presenting with any overt signs &amp; symptoms of periodontitis, including loose teeth not associated with trauma – spacing or spreading of the teeth – and/or gingival abscesses or gingival suppuration, require prompt periodontal evaluation</li> <li>• Patients with diabetes who have extensive tooth loss should be encouraged to pursue dental rehabilitation to restore adequate mastication for proper nutrition</li> <li>• Oral health education should be provided to all</li> </ul>

				<p>patients with diabetes</p> <ul style="list-style-type: none"> <li>• For children and adolescents diagnosed with diabetes, annual oral screening is recommended from the age of 6–7 years by referral to a dental professional</li> <li>• Patients with diabetes should be advised that other oral conditions such as dry mouth &amp; burning mouth may occur, &amp; if so, they should seek advice from their dental practitioner. Also patients with diabetes are at increased risk of oral fungal infections &amp; experience poorer wound healing than those who do not have diabetes</li> </ul>
American Diabetes Association, 2017	Primary care providers	Adults & children with diabetes	Evidence-based recommendations developed by ADA Professional Standards Committee. Evidence for dental guidelines is not graded.	<ul style="list-style-type: none"> <li>• Consider screening for comorbidities including periodontal disease in initial &amp; ongoing care</li> <li>• Refer diabetic patients to dentist for comprehensive dental &amp; periodontal examination</li> <li>• Management should involve team, including a dentist</li> <li>• Be aware of comorbidities, which includes periodontal disease. “Periodontal disease is more severe and may be more prevalent in people with diabetes than in those without. Current evidence suggests that periodontal disease adversely affects diabetes outcomes, although evidence for treatment benefits on diabetes control remains unclear.”</li> </ul>

### Oral Cancer

US Preventive Services Task Force, (Moyer, 2014).	Primary care providers	Asymptomatic adults	Systematic review of evidence on whether screening for oral cancer reduces morbidity or mortality and accuracy of screening for identifying oral cancer or potentially malignant disorders that have a high likelihood of progression to oral cancer.	Concludes that the current evidence is insufficient to assess the balance of benefits & harms of screening for oral cancer in asymptomatic adults.
American Cancer Society, 2016	Primary care providers	Adults 30 y age & older	Committee review of evidence	Adults who have periodic health examinations should have the oral cavity examined as part of a cancer-related checkup.
American Academy of Family Physicians,	Primary care providers	Asymptomatic adults	Commission on Health of the Public and Science (CHPS) critically reviews	Concludes that the current evidence is insufficient to assess the balance of benefits & harms of screening for oral cancer.

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2017

recommendations  
released by the  
USPSTF and makes  
recommendations to  
the AAFP Board of  
Directors.

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## Practices Demonstrating Integration of Oral Health and Primary Care

### BACKGROUND

Section one described the evolution of the integration of medicine and dentistry, the varied integration models proposed to link oral health with primary care, and models of health literacy that tie the consumer/patient's understanding of the health care system with their access to care and outcomes. Section two described the relatively few clinical practice guidelines in place related to the integration of oral health and primary care. In this Section, we examine the published examples in the United States of the integration of oral health into primary care; apply a conceptual model to the examples found in the literature; and assess the extent that health literacy was involved.

A number of change agents have brought about a vital examination of how oral health and primary care intersect. These change agents, from professional organizations to federal and state governments, local and national philanthropies, and coalitions support the goals of improved oral health care, better patient experience, and reduced cost, the Triple Aim, and posit that improving oral health could improve overall health (Snyder, 2015).

Many agencies within the federal government laid a framework for integration of oral health into primary care. President Bush established a nationwide health center infrastructure as a means to increase access to comprehensive primary oral health, mental health, and substance abuse services for vulnerable populations (Shi et al., 2010). Congress' approval of contracts with dentists' private offices enabled federally qualified health centers (FQHCs) to seek dental care for a larger segment of their population. The Office of Disease Prevention and Health Promotion issued the National Action Plan to Improve Health Literacy in 2010 that stated that all Americans have the right to health information that enables them to make informed health care decisions and that health care services should be delivered in ways that patients can easily understand. The Centers for Medicaid and Medicare Services (CMS) advised states to establish new oral health goals to increase the use of preventive oral health services (POHS) for children (CMS, 2011). The Department of Health and Human Services (DHHS) announced the Leading Health Indicators for Healthy People 2020 including an oral health indicator that children see the dentist once per year (ODPHP, 2017). HRSA drove health centers toward the patient-centered medical home model (PCMH) and created the Integration of Oral Health and Primary Care Practice (IOHPCP) initiative including oral health core clinical competencies and a systems approach to implement them in primary care practice (NNOHA, 2012, Integration of Oral Health and Primary Care, 2014). The DHHS Oral Health Coordinating Committee released an Oral

Health Strategic Framework for 2014-2017 that included goals to integrate oral health and primary health care and improve health literacy. The Strategic Plan noted that integration of oral health and primary care should be bi-directional, where oral health education and delivery of preventive oral health services would be delivered in primary care settings, and dental professionals should assume a role in screening for chronic diseases to improve health and reduce the cost of chronic disease for the health care system.

State governments struggled with the dual responsibility for improving oral health care for low income residents and controlling the growing cost of Medicaid. A policy brief released by the National Academy for State Health Policy described how states could facilitate the Triple Aim by improving oral health programs in certain areas, diabetes, maternal and child health, and avoidable emergency department (Snyder, 2015). States organized partnerships with state dental associations, departments of health, and national and local nonprofit and philanthropic organizations to create demonstration programs that would develop health care organizations that would be held accountable for increasing access to dental care through capacity building, community engagement, education and integration of health (Delta Dental of Colorado Foundation, 2014; CO MDI, 2015; IDPH, 2015; Snyder, 2015; California Department of Health Care Services, 2017; Leavitt Partners, 2015; McConnell et al., 2017).

A coalition of funders led by DentaQuest Foundation, REACH Healthcare Foundation, and Washington Dental Services Foundation, (the Funders group for Oral Health Policy or FOHP) (Schnopfel 2010) and the National Interprofessional Initiative on Oral Health launched a comprehensive initiative in 2014 to develop a framework for primary care teams to deliver POHS and improve the referral mechanism to dental offices (Phillips and Hummel, 2016). A multidisciplinary expert team working with Qualis Health developed the Oral Health Delivery Framework for integration of oral health and primary care and an Implementation Guide that has been endorsed by 18 professional academies and organizations.

Conceptual models for integration of health care have been proposed that range from no integration (Leutz, 1999) to simple models of physical co-location to complex models (Bautista et al., 2016; Valentijn et al., 2013, 2015). As described in Section 1, the complex model that we chose, the Rainbow Model of Integrated Care (RMIC) was developed by Valentijn et al. (2013, 2015) and considers a broad collection of elements that describe the health care system from a micro, meso and macro approach, including person-focused care and population-based care. This is consistent with the approach directed by CMS to the states to use an all-encompassing strategy to identify gaps in health care coverage, problems with reimbursement rates and the size and type of the workforce, provide outreach and education to families on the importance of oral health, consider using dental home strategies, and formulate strategies to identify and serve hard to reach state-specific populations (CMS, 2011).

Health literacy plays a key role in achieving the behavioral change needed to improve oral health, particularly among those most vulnerable. The publication of the 10 attributes of a health literate health care organization made a substantive difference in the recognition that the patient did not bear the responsibility to comprehend their health conditions and treatment required, but rather that organizations need to construct care systems which enable people to understand what is being said, use the information, navigate the system, and take advantage of needed services to maintain their health (Brach et al., 2012).

The McCormack et al. (2016) social ecological model describes five levels within the environment (individual, interpersonal, organizational, community and macro-policy) and states that in order for health promotion interventions to be effective, they must address two or more levels to achieve behavior change. Moreover, such interventions targeting multiple levels must reinforce each other in order to be more likely to be sustainable. Further, they state that successful health information must consider the delivery, the materials, tools provided to the public, and the communication skills of the health care professionals. All of these are critical to an implementation of integration among various health professionals.

The purpose of the environmental scan was to assess the types and levels of existing programs that integrate oral health and primary care, how health literacy is included in the integration efforts, if available, and determine effective health literacy practices that could promote an actionable primary care model.

## METHODS

The primary outcome for the section is “a list and summary descriptions of existing practices” which we interpreted as types of integration involved with screening, oral health education, counseling, and delivery of preventive dental services in primary care or other nontraditional dental delivery settings or by nondental personnel. The integration of medical screening of preventive services by dental personnel in dental offices, (e.g. diabetes screening within the dental office or screening for gaps in patient utilization of preventive medical services) and the delivery of preventive health services by dental personnel in community or school-based settings, in all cases followed by appropriate referral to the primary care practitioner was not a goal of the scan, however it was included in the findings if it accompanied an integration program of oral health in primary care.

## Review of the Published Peer-reviewed and Grey Literature

Multiple strategies were used to obtain information about integration programs and existing practices. We first consulted reference librarians at UCLA and at University of North Carolina (UNC) who helped to establish relevant search criteria and to identify relevant articles. An environmental scan is a methodology that can be used to gather a broad amount of information about a topic, including both peer reviewed literature and grey literature, which is noncommercial and non-peer-reviewed literature including publicly available program information. Grey literature is that “information produced on all levels of government, academia, business and industry in electronic and print formats not controlled by commercial publishing i.e. where publishing is not the primary activity of the producing body” (Schnopfel, 2010). Recognizing the absence of a quality review process inherent to the peer-reviewed literature, we considered the standard AACODS guidelines to assess whether grey literature documents were of sufficient quality to be included in the scan. A high quality publication is one where: the individual or group responsible to produce the content is reputable and has authority (Authority); the document has a clearly stated aim and is supported by authoritative references/sources (Accuracy); the document clearly specifies the population group to whom the report applies (Coverage); the opinion is unbiased or clearly states its bias (Objectivity); the document has a date and reference list that is reasonable for the intended use (Date), and, the item offers meaningful context, strength, impact, or unique position (Significance) (Tyndall, 2010). Grey literature that clearly did not have an authoritative group, with a clearly stated aim, supported by authoritative sources, that specifies a population group, states an unbiased opinion, is dated and offers meaningful significance were not included. We chose documents with an enduring physical location, that is, they were physically published, and not shown only via a temporary website in separate webpage components.

The review of existing practices was limited to English language articles from 2000 to present conducted in the United States, as the education, delivery and financing systems are different from other countries. We excluded demonstration programs that were described as intra-disciplinary in nature, such as adding midlevel providers to dental programs, but included the programs if new dental providers were introduced to primary care practice. Likewise, we excluded stand-alone public health programs that had no connection to a primary care program.

Key articles and initial search words were identified. We then conducted multiple iterative searches in PubMed using various combination of keywords and MeSH terms (Medical Subject Headings) and keywords to identify relevant articles. MeSH terms included “Oral Health”, “Dental Health”, “Health Status”, “Primary care”, ‘Integrat’, “Integration of dental health and primary care”, “Comprehensive Dental Care”, “Delivery of Health Care”, “Comprehensive Health Care”, “Integrated”, “Patient-Centered Care”, “Medical Home”, “Interprofessional”,



“Inter-professional”, “Delivery of Health Care, Integrated”, “Dentistry”, “Integration” and “United States.”

We used the advanced search criteria to locate relevant articles in the Medline, PubMed, Google, Google Scholar. We also included the option to review Similar Articles recommended by the databases. A hand search was made of the reference lists of relevant articles to seek additional sources. Literature searches were structured around five categories of relevant MESH terms, accompanied by “and”, or “or”, and “Review” to elicit different aspects of the research question. Articles were uploaded to a shared F1000Workspace project, and some suggested related references were obtained from the reference management tool.

### Expanding the Search for Programs beyond the Found Published Literature

The authors made a concerted effort to find a large and diverse group of health professionals who might have integration programs not published in the peer-reviewed literature, either because the program was in progress or was not part of an institution that planned a formal published evaluation. In addition to the published literature, the authors identified experts via conference programs, dental and other health professions schools with known programs on integration, representatives of foundations who have funded integration programs, and selected government representatives from DHHS and National Institute for Dental and Craniofacial Research who funded research or demonstration programs. We then contacted people directly either via telephone or email to ask to discuss their programs.

Because of the timing of the scan, the authors also reached out to people attending, presenting on or publishing on the topic of integration of dental health and general health at the three national dental education, research, and public health and practice meetings occurring during a six-week time period for data collection, the 2017 American Dental Education Association (ADEA) meeting in Long Beach, California, the 2017 International Association for Dental Research (IADR) meeting in San Francisco, and the 2017 National Oral Health Conference (NOHC) meeting in Albuquerque, New Mexico. The authors sent email invitations to 65 potential attendees of the meetings. The invitation explained that an environmental scan was being conducted and that recipients were invited to submit information about their integration programs, to meet with one of the investigators at the upcoming meetings or speak to them over the telephone. Responders could either accept the invitation or provide the name and contact information for other individuals working on their program, thus expanding the outreach to the integration community. The authors also personally attended sessions describing reports of such programs at the conferences.

The authors also posted a similar invitation on the University of Pittsburgh dental public health listserv, with an enrolled population of about 1,700 (personal communication, Robert Weyant)

and the international health literacy listserve, with an enrolled population of 1,387. Recipients to the message were also invited to submit information about their integration program, a description of the extent to which health literacy considerations were addressed in the program design or implementation, and a link to a website or other materials. For those who responded follow up meetings or calls were made to respondents.

The authors reviewed the websites for the major foundations and government agencies funding programs and reports of programs involving integration of dental health and primary care to find names and contact information for programs integrating dental services and primary care.

### Conceptual Model Applied for the Environmental Scan

As described in Section 1, we selected the Rainbow Model of Integrated Care (Bautista, 2016, Valentijn, 2015), a comprehensive model that considers six health system elements and modified the key features of each level of integration to better represent the U.S. policy, financing, care delivery, and health system structure. This modified RMIC, or M-RMIC uses the following definitions when considering the level of integration represented in the documents (See Figure 3-1).

- Clinical Integration refers to the degree to which patient care services are coordinated across different times, places, and professional disciplines (Valentijn, 2015). Examples include a physician referring a one-year old child with caries to a pediatric dentist, or a dentist offering integrated care by referring a patient with a very high blood pressure reading to a physician.
- Professional integration includes the extent that various health professionals share an understanding of their roles in coordinating a comprehensive continuum of care for their patients. A physician who tracks the one-year old's referral to make sure the pediatric dentist accepts the child as a patient would demonstrate professional integration.
- Organizational integration lays out the responsibilities and shared governance and accountability between multiple organizations in order to coordinate services that would provide appropriate care for a specific patient population. The relationships could be laid out in contracts or strategic alliances between, for example a medical insurance plan and a dental office to create a referral network for a specific patient population, or a dental insurance plan and a medical insurance plan for how augmented periodontal treatment could be provided to diabetic patients.
- System integration refers to the formal and informal political agreements that enable (or retard) professionals and organizations to deliver a comprehensive continuum of care. Adhering to or changing scope of practice laws, reimbursement mechanisms, and professional organizations' attitudes toward midlevel providers all could represent examples of system integration.

- Functional integration describes the support systems and people who coordinate operations. An example could be communications staff who review and create clear communications on behalf of the health care staff.
- Normative integration refers to the extent to which the organization's or system's mission and values are shared and are consistent with the actions. The decision of leadership within a health care organization to help develop community programs that address the provision of food and housing for vulnerable diabetic populations describes the shared values in operation. Functional and normative integration work across the former four integration types.

As a part of describing the RMIC, Valentijn conducted a multistep process to determine the key features associated with the dimensions of integration. In a three-step process, he established a tentative list of 59 integration features based on the literature and then used thematic analysis to categorize the features around the dimensions of integration. Using a Delphi study, he reduced the 59 features to 34 features distributed across the six levels.

There were several limitations to the RMIC that led us to modify the model for the environmental scan. The author noted that the expert panel did not explicitly include experts with a macro orientation or policy background (e.g. policy makers or health insurers) and also did not include representation from the U.S. in both rounds one and three of the Delphi panel. Thus, due to the differences in the health care system in the U.S., we reintroduced six of the key features in the Functional (Human resource management, Resource management, and Support systems and services) and System (Social value creation, Available resources, and Population features) integration levels for the environmental scan.

Health literacy interventions were identified from written publications and the examples were assigned to each integration level in the M-RMIC to form the conceptual Modified- Rainbow Model for Integrated Care and Health Literacy (Horowitz et al., 2014; McCormack, 2016; Weaver, 2012; Brach et al., 2012) (See Figure 3-1). For example, a Professional integration health literacy intervention could include multidisciplinary patient information materials for diabetes or pregnancy, whereas a health literacy intervention at the organizational level could include a requirement that all staff be trained in cultural competency, or facilitating the scheduling of appointments with other services.

#### Analysis of Integration of Oral Health and Primary Care Practices

We collected information about the program, including the program name (if named), patient population served, location, type of services offered, type of provider (e.g. medical, dental, case manager, behavioral), and type of health literacy intervention mentioned in the publication. We

used only publications about existing programs that sufficiently described the integration type and the service and population group provided so that we could characterize the type and level of integration involved. Each program is counted only once, unless specific sites are described within the publication that explains the information above on a site-specific basis.



**FIGURE 3-1.** Comprehensive Modified–Rainbow Model of Integrated Care and Health Literacy

We categorized the services provided through integration into four types of oral and general integration plus an ‘Other interventions, including health literacy’:

- Preventive oral health services provided by medical providers (POHS)
- Preventive oral health services provided by dental providers in primary care clinics or non- traditional settings
- Preventive health services by a dental provider (PHS)
- Case management or coordination and referral services
- Other, including the specification of health literacy interventions.

We used qualitative analysis to categorize and determine the frequency of services and the key features of the M-RMIC presented in the publications for each type of oral and general health integration and population groups served. Examples of types of integration found were recorded and analyzed using a thematic analysis, a common form of analysis used in qualitative research to record and analyze themes found within the data that are associated with the research question, in this case, types of integration (Braun and Clarke, 2006).

## RESULTS

Using the multi-pronged search of the published peer-reviewed and grey literature featuring the integration of oral health and primary care, we selected 11 programs that had at least one peer-reviewed article and 13 programs that were published only in the grey literature as reports or monographs. These programs met the basic criteria for presenting information about the program, patient population served, location, type of services offered and type of provider. As described in the methods, we also sought existing programs via outreach to the oral health and health literacy communities to augment the published literature. Through our outreach to the community, we located two additional integration practices, the Michigan Grace Health Maternal Infant Oral Health program and the Healthy Kids Healthy Teeth program of Alameda County, California. Neither of these were found via the literature searches, but both had available documentation (e.g. final reports to funders, local publication, described in a testimony to an assembly) and had continued their activities long enough to become an accepted part of clinical programs within their community. These two were included with the grey literature, bringing the total number of programs in grey literature to 15. Many of the programs found through the peer-reviewed literature had more than one publication, and an additional publication(s) could be grey literature. Conversely, the programs found via the grey literature often included more than one site or practice, ranging from 1 to 8 described in detail.

Table 3-1 describes the four integration categories and provides examples of each category. The most common type of integration was POHS offered by physicians, with 37 examples, followed by 22 examples of use of case managers. There were 16 examples of dental providers being integrated into primary care practices, or other nontraditional settings to offer oral health services. Although we did not accept published standalone demonstrations offering medical preventive services provided by dentists, there were 16 examples where such bilateral integration was found in programs accompanied by other integration of oral health into primary care, such as physicians providing POHS. Thus, there are 91 integration examples described among the 26 programs documented.

The publications varied, from descriptive integration publications that showcase how integration of oral health and primary care can increase access to preventive services, to documents created to develop resource guides about integration of dental health and primary care, or applied demonstration projects that led to the implementation of integration practices.

Table 3-2 describes the name of the program or study, the author(s) and date of publication, the population served and location, and which of the four types of integration categories are present in the program. The documents are separated into two sections, first are the peer-reviewed documents followed by the grey literature. In cases with multiple publications they are placed at the location of its earliest publication. Within each section, documents are placed in chronological order, by earliest date of the publication. The population groups served ranged from a narrow age group (children 0-3 years of age) to all ages, and from specific disease categories (e.g. adult diabetics) to location-specific population groups (e.g. rural families). The table demonstrates that oral health integration is being implemented in a wide swath of the country. There are 28 states plus Washington DC and the National Head Start Association represented by the integration programs described. Integration is applied in urban and rural areas, commercially run dental plans, FQHCs, private medical practices, and academic health centers. Some of the documents showcase more than one program. Some documents represent one program in existence at numerous clinic settings. The case studies' intent and focus represent the varied purposes that led to the reports. Case studies shown in these documents vary in length, purpose, and depth from brief vignettes focused on one important but challenging aspect of integration (e.g. interoperability of electronic patient records) to examples from state-wide demonstrations to achieve the Triple Aim for the Medicaid population.

### Practice Integration

Within the publications referenced in Table 3-2, integration examples include the state-wide Into the Mouth of Babes program in North Carolina which has been in existence since 2001 (Rozier et al., 2003; Patel et al., 2011), the multisite Colorado Medical-Dental Integration Project to integrate dental hygienists on medical teams (Braun and Cusick, 2016; Braun et al., 2017; CO

MDI, 2015), the 12 sites involved in the Interprofessional Study of Oral Health in Primary Care (Mitchell-Royston et al., 2014), the county-wide children's oral health program of Seattle (Wysen et al., 2004), and the 19 sites involved in First STEPS Improving Health Outcomes for Children in Maine (Gray and Fox, 2015). A rural health interprofessional program was developed by Colorado, Pennsylvania and South Carolina to help bring new clinical and systems-level quality improvement skills to their staff (Boynes et al., 2017). In addition to the integration of dental providers into primary care, they developed a Learning Collaborative with training in the use of the expanded head, ears, eyes, nose, oral cavity, and throat (HEENOT) examination, motivational interviewing, implementation of QI practices and measuring of impact. Thus, the integration of oral health to primary care represented by these examples is far-reaching.

*Preventive oral health services by Medical providers.*

There are 37 examples of integration where medical providers offer preventive oral health services. Of these, 33 unduplicated examples of integration involved pediatric preventive oral health services. The demonstrations represented numerous states and a variety of clinical settings, a range of age groups that were served by the medical providers, and a variety in the length in which integration had been in existence. As shown in Table 3-1, the child age group included demonstrations where the medical providers only served children 0 to 3 ½ years of age in physicians' private offices (Rozier et al., 2003), at-risk children were found via community agencies and referred to participating medical and dental providers (Wysen, et al., 2004), or served by FQHCs (Langelier et al., 2015). The exact range of preventive services varied from site to site, from a simple oral screening and referral to the dentist to clinics where the medical team would provide oral exams, oral hygiene instruction, fluoride varnish (FV), oral health and nutritional education, and anticipatory guidance. In some cases, the oral health education was provided to the family, stressing nutrition, use of topical fluoride, and the need to have a dental home and to seek regular dental care.

There were ten examples of preventive oral health services being offered by medical providers to pregnant women or pregnant women and children, including the National Head Start Association, four clinics in Colorado and Montana that participated in a HRSA-sponsored Oral Health Disparities Collaborative Pilot (NNOHA, 2008) and four models in Michigan, California, Pennsylvania, Idaho, and Washington (Fitzpatrick, 2015; Crall, et al., 2016; NNOHA, 2008; Brownlee, 2012; Langelier, et al., 2015; Snyder, 2015). The intent of these integrations was to provide counseling to pregnant women about their own health and that of their upcoming infant's health and need for dental care. Oral health counseling was provided by medical providers, other times by a dental hygienist. In either case, referral was made to dental so the pregnant woman would receive care during pregnancy, and to facilitate the likelihood of a Year 1 dental visit for the infant. One such practice made the referral quite personal, by inviting the dentist to come to the medical clinic where the Year 1 visit was made jointly by medicine and dentistry.

Implementation of the chronic care model was also reported. The most common example was for diabetic patients by the Marshfield Clinic system in Wisconsin (Acharya, 2016; GIH, 2012; Brownlee, 2012; Hummel et al., 2015; Snyder, 2015). Marshfield has been an early adopter of integration of oral health and primary care and of robust, integrated electronic health records (EHR). Marshfield's process for diabetic patients was for medical providers to conduct an oral health risk assessment and refer their patients to dental. But, they went one step farther, and incorporated oral health periodontal treatment quality metrics to assure that the process was tracked. Other groups that reported integrating care for diabetic patients were in safety net clinics in California, Idaho, Pennsylvania and Seattle (Langelier et al., 2015; Brownlee, 2012; Highmark, 2009). In common, each of these clinics implemented a similar risk assessment, referral for a dental visit, and a prompt/tracking in the EHR. But, there were unique nuances, such as the diabetes collaborative implemented by Idaho's Terry Reilly Health Services, where they used a health literate intervention, the viewing of a phase contrast microscope by the patient to emphasize the presence of bacteria to their patient (Brownlee, 2015). The chronic care model was utilized for both diabetic patients and those with HIV in Seattle (Brownlee, 2015). And, although not preventive in nature, one rural state trained family practice residents and emergency residents both didactically and with an expanded clinical rotation in order to handle dental emergencies, because of the paucity of dentists in select areas of the state (Beestra et al., 2002). Training of the residents included dental anesthesia, diagnosis and treatment planning, and management of dental trauma and infection.

*Preventive oral health services by dental providers in primary care clinics or nontraditional settings.*

There were 16 examples where preventive oral health services were delivered by dental providers, often dental hygienists in nontraditional settings, primary care clinics, and school-based centers (Beestra et al., 2002; Kaufman et al., 2006; NNOHA, 2008; Highmark Foundation, 2009; Brownlee, 2012; Levitt, 2015; Fitzpatrick, 2015; Langelier et al., 2015; CO MDI, 2015; Maxey, 2015; Braun and Cusick, 2016; Snyder, 2016; Boynes et al., 2017). Some OBGYN and pediatric clinics in Michigan, Wisconsin, Colorado, New Mexico, Pennsylvania, and Minnesota invited dental hygienists to co-locate in the primary care clinic, to make the 'referral to dental' quite seamless. At community health centers in Wisconsin and Minnesota, the dental hygienists conduct screening of infants and toddlers in pediatric clinics, providing a good example for the pregnant women who they also see. In Pennsylvania, a primary care clinic developed a Diabetes Healthy Outcomes Program and set up a multidisciplinary same day visit by dental, ophthalmology, podiatry, and the dietician for each diabetic patient (Highmark, 2009).

One way that states have explored improving access to dental care is through new workforce models (Langelier, et al., 2015; Braun and Cusick, 2016; Leavitt Partners, 2015). There are examples in Colorado, Massachusetts, and Pennsylvania, where dental hygienists work in public



health, hospital, rural, and community settings, including school-based programs. Dental providers work in both primary care clinics and on medical teams. The New Mexico Health Commons hired dental hygienists to provide preventive oral health services to pregnant women, children, diabetic and cardiac patients alongside the medical providers (Kaufman et al., 2006; Beestra, et al., 2002). In Washington, medical and dental services are co-located in some of their clinic sites. Medical providers offer a limited dental screening in the primary care center, and a dental assistant performs a limited dental screening on mobile health clinic units (Maxey, 2015). School-based programs are documented in Kentucky, Maine, and California, where the dental hygienists provide preventive oral health services and the dentist rotates to the clinic on a bimonthly basis (Langelier, et al., 2015). In Pennsylvania's rural health program, public health dental hygiene practitioners (PHDHP) who can practice without the supervision of the dentist, rotate from the co-located operatory in the pediatric clinic to other rural health center sites four times per month (Boynes et al., 2017).

Two novel approaches to embedded integration and expanded workforce models dealt with the growing number of patients who seek care in the emergency department (ED) for dental complaints. A Pennsylvania clinic created a dental emergency-only clinic two days per week to reduce the load on the hospital ED and provide a combination of treatment and oral health education to encourage patients to come to a dental home (Highmark, 2009). An accountable care organization (ACO) in Minnesota combined a medical center, an FQHC, a health plan and a social services organization to provide integrated care for people of Hennepin County. The high cost of ED use for dental pain caused Hennepin to develop an In-Reach program, staffed by a dentist supported by dental therapists (DTs) and expanded function dental assistants (Leavitt Partners, 2015).

*Case Manager/ Coordination of Care services and referral.*

There were 22 examples demonstrating integration of oral health and primary care that involved case management or coordination of care services. Care coordination had many descriptions and goals. In one example, the care coordination goals for a dental program were broad and specifically laid out to include “enhancing member access to high quality dental services; population health management, including provider and patient education, care coordination, and community support; assuming accountability for population outcome measures; and engaging members in preventive services and treatment compliance through incentives” (Leavitt Partners, 2015). Most examples of care coordination were narrower and represented three types of service: providing patient or family navigation around the health clinic and assisting the patients to keep up with their preventive needs; proactive searching for unmet care needs to bring episodic users or people with unmet needs to the correct place for care; and, diverting people from emergency use to draw them toward a dental home.

The first of these and most simple form of care coordination was to provide patients or families navigation around the health clinic and assisting the patients to keep up with their preventive needs. Clinical assistants in medical departments, such as primary care, OBGYN, or pediatrics helped the patient or family navigate among the various departments in the clinic and assisted patients with maintaining their preventive needs. These assistants could provide preventive dental counseling, oral health education, in some cases conduct a caries risk assessment or screening, apply FV, and make a referral to dental (Rozier et al., 2003; Ramos- Gomez, 2014; Crall et al., 2016; Isman, 2006; Fine, 2015; Brickhouse et al., 2013). In some cases the team of coordinators also worked externally to help to connect patients or families with social service needs such as transportation, housing, or eligibility for care (Wysen et al., 2004; Leavitt Partners, 2015; Langelier, 2015).

Several integration programs took a proactive role in identifying and meeting the unmet care needs of special populations in order to bring these individuals to the best place for care. A clinic in New Hampshire reported that during regular care team meetings, the primary care providers expressed an interest in building “overarching oral health clinical goals” and emphasized the importance of bidirectional referrals among all clinical areas at the FQHC (Langelier, et al., 2015). In Rhode Island, a dental clinic coordinator took a proactive role in searching the clinic’s records for new deliveries and inviting the mother to bring her baby for an age 1 visit. Nurse Managers discussed high-risk patients on a regular basis and community health workers visit patients at home, especially if the patient had visited the ED or missed a dental appointment (Langelier et al., 2015). The Perinatal and Infant Oral Health Quality Improvement Program for Connecticut sought to engage community members to spread the word that seeking dental care is important during pregnancy and to encourage pregnant women to seek dental care (Snyder, 2015). NYU’s Lutheran Medical system program had patient treatment coordinators provide health education, information, and navigation, which together helped to reduce their failure to show rate (Langelier et al., 2015). Behavioral health providers counsel families in Ohio whose children miss dental appointments and assist with strategies to help the parents regularly get their children to their dental appointments (Tallinger, 2016).

The high use of the ED for caries-related dental emergencies is also being addressed through integration programs, and notably, through care coordination programs. The goal is to divert people who have no dental home from high cost emergency use and draw them toward a dental home. In addition to the approaches where dentists practiced directly in the hospital to accept dentally-related emergencies, care coordination was mentioned as an approach to screen and refer directly to a local (and close) dental clinic that accepted dental emergencies. Publications that described such integration programs included clinic examples in Pennsylvania, Wisconsin, Minnesota, and Massachusetts where local hospital EDs diverted patients to local safety net clinics (Langelier, 2015; Leavitt Partners, 2015). An ACO in Minnesota contracted for a case manager and assigned a community health worker to the local hospital ED to assess cases of

dental pain and triage the complaint. Options included escorting the patient to an in-hospital dentistry clinic, which had its hours and mission enhanced to handle the diversion of patients for walk-in availability, and setting patients up for a same-day appointment in another local clinic. To increase the probability of success, transportation services were offered for those being transferred off-site. The ACO assigned dental therapists to expand the workforce at the in-hospital clinic and leverage the time of the dentists (Leavitt Partners, 2015). Similarly, a care coordinator at a hospital ED in Connecticut referred patients to 'next available appointments' via a web-based application (Langelier, 2015). In all cases, the goal was to build a culture of prevention around a dental home. A Spokane Hospital developed a novel solution, the Dental Emergencies Needing Treatment (DENT) program with support from Washington Dental Service Foundation and Empire Health Foundation (Snyder, 2015). The intent of the program was to connect ED patients with dental problems to dental providers who were recruited to join a referral network. The DENT program included case management, coaching, and creation of a referral network.

Several integration demonstrations made specific mention of how electronic tools could help with the care coordination needed for successful integration. A Coordinated Care Organization in Oregon described the potential value of the Emergency Department Information Exchange database to acquire valuable information on the frequency of patients' ED admission (Leavitt Partners, 2015). New York's Perinatal and Infant Oral Health Quality Improvement Program designed health information technology tools for case management of high-need mothers and infants (Snyder, 2015). Delta Dental of Iowa approached the task of transitioning a Medicaid expansion population to a dental home population using a care coordination approach fueled by people and technology (Leavitt Partners, 2015). The Delta Dental staff, with supportive patient education materials in hand, provide education to patients who seek care in the ED rather than their dental home. Separately, dentists and members complete a health IT oral health risk assessment tool (past dental care, age, snacking habits, periodontal disease, health history, etc.) that, when completed will help Delta Dental manage care for the population.

*Preventive medical services by dental providers.*

Despite this not being the primary intent, the 16 integration examples show that dentists within some health care environments are accepting their role as a member of a primary care team and conducting screening and referral of systemic conditions in order to improve the population's health. There were examples in California, Wisconsin, Minnesota, Connecticut, Pennsylvania, Rhode Island, and Washington of dentists performing medical history review to find elevated blood pressure or history of hypertension with no appointed medical home, taking blood glucose levels, or reviewing patient's care plans and care gaps in preventive services (Wysen et al., 2004; Snyder, 2016; Brownlee, 2012; Leavitt Partners, 2015; Langelier, 2015). In each case, the patient was then referred by the dentist to medicine. At Marshfield Clinic, they have built chronic disease management tools so that periodontal treatment became a quality metric for a diabetic

patient (GIH, 2012). Starting dentists early along this new pathway of integration, in Massachusetts, they hosted a dental residency in the ED to handle pediatric patients (Maxey, 2015).

### *Health Literate Practices.*

The words ‘health literacy’ infrequently were found within the 32 publications. Nonetheless, there was clear evidence that health literacy and cultural competency were on the minds of the individuals creating and participating in the integration programs. The health literacy challenges most commonly discussed in the examples represented in this analysis were the comments by clinic staff at FQHCs, stressing the importance of oral health literacy of families; noting the extended hours so that people have access to get to a dentist; use of medical interpreters for patient education; and the proffered externships or residencies as a good teaching vehicle for students and residents (Langelier, et al., 2015). The health literate actions that were found among the documents were anticipatory guidance, care coordination and management, reinforcement of provider health education messages, and clever uses of technology to get a message across to a patient.

Anticipatory guidance, the “process of providing practical, developmentally-appropriate information about children’s health to prepare parents for the significant physical, emotional, and psychological milestones” (AAPD, 2013) is required of pediatric dentists in their oral examinations. It effectively moves the provision of information from a handout to be given to the parent at the end of a dental visit to a discussion between provider and parent about the child’s health and behavior, through the use of motivational interviewing. An early use of the concept of anticipatory guidance can be found in the Into the Mouth of Babes study, where the “risk assessment is conducted using a patient encounter form that guides the provider through a series of major risk factors for early childhood caries such as family history of dental disease, dietary practices, oral hygiene behaviors, and fluoride exposures. This assessment also can be used to individualize counseling of the primary caregiver and for a determination of the need for dietary fluoride supplements” (Rozier et al., 2003). The use of anticipatory guidance was found multiple times in the integration cases, as well as descriptors such as nutritional counseling, oral health education, parent and family counseling. To be confident that the discussion took place, it was often added to the EHR, to guide the providers electronically (rather than using a form) through the visit.

Adults were not left out in the consideration of guidance and counseling, and electronic tools are a definite part of health literacy. A clinic in Idaho used a visual 30-second health literacy message. The dentist would present the patient to a phase contrast microscope showing the patient the presence of bacteria in their mouth (Brownlee, 2012). Marshfield Clinic described increased use of patient portals to provide health education materials and after visit summaries (Acharya, 2016). The Colorado medical integration project described the use of tele-health

enabled teams to bring needed expertise to a discussion while the patient is still present (Braun and Cusick, 2016).

The Begin with a Grin program in Virginia described the goal of the program as addressing access barriers for Medicaid patients through home visitation by a community health nurse and pediatric nurse practitioner to apply FV, and educate the primary caregivers about oral hygiene, nutrition, and *oral health literacy* in order to reduce high-risk behaviors leading to early childhood caries (emphasis added) (Brickhouse et al., 2013). Variants of care coordination and case management, the modern day adaptation of patient navigation, were discussed by word, in over 20 publications, and by description in even more. Care coordination was mentioned in many ways that will impact health literacy; to help patients secure enrollment in public financing to access dental care; to guide them from the ED to an FQHC that sees dental emergencies; to deliver family counseling on oral health and nutrition; to deliver “culturally competent, patient and family-centered care” to realize that infants need to see the dentist even if they don’t have a lot of teeth (Brickhouse et al., 2013; Wysen et al., 2004; Ramos-Gomez, 2014; Crall et al., 2016). As the National Network for Oral Health Advocacy (NHOHA, 2012) explains, one of their ‘promising practices’ of the patient centered health home is to facilitate the patient’s or family’s self-management by focusing “on patient literacy and having appropriate educational materials” (NNOHA, 2012).

Several integration programs included dental students or dental residents in their programs, as provider extenders to increase capacity and to attract dentists to dental health professional shortage areas (Langelier et al., 2015). Rhode Island reported that dental student externships were useful to help these future dentists learn about other cultures and low health literacy, while NYU’s Lutheran commented on the valuable experience learned providing care to clinic populations where patients speak more than 50 languages (Langelier et al., 2015). Hummel (2015) commented that “underserved patients face additional challenges in accessing dental care including transportation issues, health literacy challenges, and social and cultural factors”, demonstrating a consideration of social determinants of health. The Holyoke clinic in Massachusetts reported that their pediatric dental residents consult in the clinic ED, and perform epidemiology evaluations on the patient records to better understand the oral health needs of the population (Maxey, 2015).

The other common theme found within the documents related to the importance of a reinforcement of messages to the patient, a common approach for health literacy. A staff member in the Interprofessional Study of Oral Health in Primary Care commented that “families reported receiving different information about the age of the first dental visit, brushing with fluoride toothpaste, and pacifier use from various sources”. Therefore, a need for a consistent messaging regarding good oral health habits was identified (Mitchell-Royston, 2014). A dentist at Marshfield clinic commented, “If we can consistently get providers to share that it’s especially

important for patients with diabetes to take care of their oral health, then that's a win" (Hummel et al., 2015).

#### *Application of Conceptual Model.*

Table 3-3 depicts how we applied the M-RMIC conceptual model to examine specific tasks that exemplify each specific level. For example, clinical integration activities include developing appropriate education materials in a health literate example, as described by the pediatric clinicians and nurses for their counseling of families. Ideally, a medical and dental provider would work together to develop appropriate educational materials for all members of the team and families. An example of this is when physician assistants use anticipatory guidance to educate patients in the Interprofessional Study of Oral Health (Mitchell-Royston, 2014). At Neighborcare Health, medical providers created an oral health protocol for HIV patients. The medical provider would then be sure that all providers were trained, an example of the Professional level of integration.

Developing a shared vision, another Professional level key feature, was described in New Hampshire when the provider expressed the goal of developing overarching clinical dental goals. Functional integration became involved in the situations where clinics utilized the electronic health record to note if a patient lacked a dental home, would flag over-due dental visits, make referrals to the dentist, utilize patient portals, and, even track sealant rates in one state where sealant rates are an important state metric. Functional integration was also represented by the involvement of staff in case management. Organizational integration was represented by the population health approach established by the clinics, and System level integration was shown in the inter-organizational strategy approached in the Wysen et al. structure (2004). System level integration is also apparent in the situations where dental residents were asked to conduct epidemiological assessments of population health. Integration at the Normative level was documented where leadership for a clinic made a decision to seek or allocate resources to build or expand upon an oral health program in order to improve the overall health of their patients. A combination of Normative and Organizational level integration was represented in New Mexico (Beestra, et al., 2002) where senior leadership decided on a novel approach to cross train medical residents to treat dental emergencies. The institution had to hire dentists and create a new department to train medical residents to increase access to care in underserved areas. Each of these levels of integration function synergistically to improve the likelihood of a successful integration program.

## DISCUSSION

The literature about integration of oral health into primary care is in an embryonic stage. There is little peer-reviewed published literature and few studies which document effectiveness of the

integration in improving oral and general health. The literature on integration of oral health and primary care offers a wide variety of information about programs, but little consistency in what is presented. A few publications carefully describe one program that was developed and implemented (e.g. *Into the Mouth of Babes*, Rozier et al., 2003). Other documents were written to provide a demonstration of *how* to design a systems approach to integration of oral health and primary care within dental offices or safety net clinics with the goal of developing resources for future practices wishing to conduct an integration program (e.g. Hummel, et al., 2015). Still other programs were developed with the express purpose of gathering methodological information: lessons-learned from implementation pilots or gaps in the integration systems in order to provide a guide or streamline an approach for future attempts at integration (e.g. Mitchell-Royston et al., 2014). Some were designed to educate state policy makers, professional organizations, or foundation representatives about service models and integration models in primary care (e.g. Brownlee, 2012; GIH, 2012; Snyder et al., 2016) and other integration case studies were initiated through funding opportunities offered by commercial insurance groups to determine best practices for integrating oral health into accountable care-type organizations (Braun and Cusick, 2016; Leavitt Partners, 2015). Few publications offer any information on outcomes on health as a result of the program.

There are limitations to the publications that we selected. We chose documents with an enduring physical location, that is, they were physically published, and not shown only via a temporary website. This left out examples of integration, for example, the Virginia Coalition website (<http://www.vaoralhealth.org/WHOWEARE.aspx>) which includes resources and a Toolkit for Integration but no formal publication. Only documents that presented primary source descriptions of an integration practice were included in the analysis of the number and type of implementation practices. Documents that re-analyze case studies could interject bias in our interpretation and inflate the number of integration practices that we found. The scope for the environmental scan called for an examination of the integration of oral health services into primary care, which left out publications such as tobacco cessation interventions in dental offices, screening for prevention in dental office (Mosen, 2016), and telehealth demonstrations, unless they accompanied examples of integration of oral health services by medical providers. The early stage of the literature on integration of oral health in primary care makes it appropriate for the application of a qualitative type of analysis (Braun and Clark, 2006).

Health literacy practices were clearly in evidence in the publications, in action, if not in word. Using an example identified within the Attributes of a Health Literate Organization we found evidence of reallocating staff to make integration successful; securing language assistance for speakers of languages other than English; making electronic portals available, and facilitating scheduling of additional services and extended days of operation, and making heavy use of case managers to assure successful navigation. Using the modified M-RMIC integration model, we also found evidence of health literacy concern at a higher level, with consideration of social

determinants of health and use of a champion to spread the message. We found evidence of concern for using consistent messaging, and multiple ways in which the message to utilize oral health prevention was delivered, an accumulation strategy that would increase the likelihood of changing behavior (McCormack et al., 2016). Therefore, just because we did not find evidence of health literacy in a published document does not mean health literacy wasn't taking place. We know from the four case studies that we conducted, where we explored numerous types of data gathering, including interviews, reviews of operations websites, and assorted documents about the integration program, that there was much discussion of the tenets of health literacy.

Regarding the type of integration, a strong emphasis was shown on the integration of preventive oral health services and primary care. This is represented in the statewide Into the Mouth of Babes program, in Medicaid transformation programs in Oregon, Massachusetts, and Kentucky, Colorado's Medical-Dental Integration Project, Kansas Primary Care Association oral health integration into safety net clinics, programs for rural areas in the Medical Oral Expanded Care Initiative (MORE Care) in Colorado, Pennsylvania and South Carolina, and two children's access to care initiatives in Maine (First STEPS) and California's First 5 Initiative. However, we also found a surprising emphasis on treatment of patients with chronic and emergent problems. The University of New Mexico Health Commons injected dental hygienists into the primary care team for pediatric and prenatal care, but also addressed vulnerable populations with chronic conditions, especially diabetes. Likewise, the Highmark Foundation of Pennsylvania supported integration as a way to improve the overall health of the population and to bring a preventive focus to a population that has sought episodic care. Care provided in the ED is not primary care, yet we included the examples if part of a larger program and if the program was clearly stated as a way to locate people who lacked dental homes, or regular primary care services. This finding deserves more consideration on integration of preventive services, as a viable means to reinforce oral health as a component of overall health. Delta Dental of Iowa approached this topic separately from the member dental clinics. Delta contracted directly with a case management services company and equipped them with health education materials as a novel intervention to create a divergent program to draw patients into the primary dental care system (Leavitt Partners, 2015).

The environmental scan successfully amassed a substantive amount of information about the integration of oral health into primary care, although on a national level the number of patients served through integration was low. There are integration examples of varying size, complexity, and scope. The information offers a variety of ways to pose a question on how to start, and a model to consider the components and strategies to consider. Health literacy applications are shown that appear to be beneficial to the management of a health delivery operation. Finally, although not the intent of the environmental scan, we found integration examples that demonstrate that dentists can accept their role as a member of a primary care team and conduct screening and referral of systemic conditions in order to improve the population's health when



positioned in specific healthcare organizations and/or have appropriate communication technologies to facilitate patient referral. It is an exciting time to consider best steps forward in integrating oral health and primary care.

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**TABLE 3-1** Categories and Examples of Integration of Oral Health and Primary Care Represented in the Peer-Reviewed and Published Grey Literature<sup>1</sup>

Category of Integration	Number of occurrences
Preventive oral health services by medical providers (POHS) <ul style="list-style-type: none"> <li>• Preventive services to children</li> <li>• Pregnant women</li> <li>• Patients with chronic diseases</li> <li>• Emergency dental services</li> </ul>	37
Preventive oral health services by dental providers in primary care clinics or nontraditional settings <ul style="list-style-type: none"> <li>• Dental services offered by hygienists to children in schools</li> <li>• Dental services offered by hygienists to pregnant women in primary care clinics</li> <li>• Dental services offered by hygienists public health &amp; community clinics</li> <li>• Limited dental screening performed by dental assistants</li> <li>• Triage of dental emergency needs</li> </ul>	16
Case manager and coordination of care services and referral <ul style="list-style-type: none"> <li>• Increase access to dental services</li> <li>• Increase access to community and social services support</li> <li>• Navigation to appropriate clinic</li> <li>• Increase access to health education and prevention</li> <li>• Divert people from emergency to primary care dental treatment</li> <li>• Use of electronic tools to enhance care coordination</li> </ul>	22
Preventive medical services by dental providers (PHS) <ul style="list-style-type: none"> <li>• Dentists screen &amp; refer for medical home, hypertension and blood glucose levels</li> <li>• Dentists review care plans to find gaps in preventive services</li> <li>• Integration of dental residents into the emergency department</li> <li>• Developed periodontal quality metrics for diabetic patients</li> </ul>	16

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<sup>1</sup> Publications may include examples of integration in more than one category.

**TABLE 3-2** Types of Existing Practices of Integration of Oral Health and General Health in Published Literature.

<b>TYPE OF ORAL AND GENERAL INTEGRATION</b>					
<b>Program name / Reference</b>	<b>Population served / # sites, Location</b>	<b>Preventive oral health services by medical providers</b>	<b>Preventive oral health services by dental providers in primary care &amp; nontraditional settings</b>	<b>Case management or coordination &amp; referral services</b>	<b>Preventive health services by dental provider</b>
<b>Peer-reviewed Publications</b>					
<b>Into the Mouth of Babes</b> Rozier et al. 2003, Patel et al. 2011.	Children 0-42 months, state-wide program in North Carolina	X		X	
<b>Kids Get Care</b> Wysen et al. 2004.	Low income children, Seattle, Washington	X		X	X
<b>The Health Commons and Care of New Mexico's Uninsured</b> Beestra, et al. 2002, Kaufman, et al 2006.	Uninsured and vulnerable populations, New Mexico.		X		
<b>Pediatric Clinicians help reduce early childhood caries</b> Kressin et al, 2009.	Children aged 6 months to 5 years, Boston, Massachusetts.	X			
<b>Child Health Investment Partnership Home Visitation Program</b> Brickhouse et al, 2013.	Rural families, Virginia.			X	
<b>Infant Oral Care Program (IOCP)</b> Ramos-Gomez, 2014.	Rural and urban low-income children, ages 0-5, California.	X		X	
<b>Colorado Medical-Dental Integration Project</b> Braun and Cusick, 2016. Braun et al.,2017, CO MDI, 2015.	Young children, Colorado.	X	X		
<b>Marshfield Clinic: Integrated Care Case Study</b> Acharya, 2016,	Adult chronic care patients in Wisconsin.	X			X



Grantmakers in health, 2012. Brownlee, 2012. Hummel et al., 2015. Snyder, 2015.					
<b>Health Partners of Western Ohio: Integrated Care Case Study</b> Tallinger, 2016.	All ages, Ohio.	X		X	X
<b>Oral Health Prevention &amp; Toddler Well-Child Care</b> Dooley et al, 2016.	Children aged 0-5 in Contra Costa, California.	X			
<b>Improving the Oral Health Care Capacity of FQHCs.</b> Crall et al. 2016; Crall et al. June 2016.	Pregnant women and parents and children ages 0-5 in California.	X		X	
<b>Published Reports Produced by Government and Private Groups Grey Literature</b>					
<b>Healthy Kids, Healthy Teeth.</b> Innovative Management of Dental Decay for Young Children Enrolled in Medicaid, 2006, Fine, 2015.	Children 0-5 years of age in Alameda, CA.	X		X	
<b>Bringing evidence and best practices into health center dental programs: Improving childhood oral health.</b> NNOHA 2008.	Pregnant women and children age 0-5, Colorado.	X			
	Pregnant women and children age 0-5, Montana.	X			
	National Head Start Association.	X			
<b>Returning the mouth to the body: Integrating oral health &amp; primary care</b> Grantmakers in health, 2012.	Children 6 months to 3 years, Group Health, Washington.	X			X
<b>Safety Net Providers: Filling the Gap, Increasing Access and Improving Health Outcomes.</b> Highmark Foundation, 2009.	Diabetic adults in Pennsylvania.		X		
	Adult patients in Pennsylvania.		X		
<b>Oral Health Integration in the Patient-centered Medical</b>	Pregnant women and diabetic patients, in Idaho.	X			X

<b>Home, Environment: Case Studies from Community Health Centers.</b> Brownlee, 2012.	Neighborcare Health, Seattle, WA.	X			X
	0-5 years of age. Dorchester House, MA.	X	X		
<b>Interprofessional Study of Oral Health in Primary care.</b> Mitchell-Royston, et al. 2014.	Primary care settings, FQHCs, private health clinics in MA, PA, CA, CO, MN, MI, WI, TX, IL, WY, DC, conducting oral health promotion for children 0-6 years of age.	X			
<b>First STEPS Improving Health Outcomes for Children Phase III.</b> Gray and Fox, 2015.	19 participating pediatric and family practices, in Maine.	X			
<b>Dental Care in Accountable Care Organizations: Insights from 5 Case Studies.</b> Leavitt Partners, 2015.	Delta Dental Medicaid expansion, 19-64, in Iowa.		X	X	X
	Adult patients, Hennepin Health, in Minnesota. Also Snyder, 2015.		X	X	
	Medicaid patients, in Oregon.			X	X
	Pediatric patients, in Ohio.	X			
<b>Grace Health celebrates first oral health patient.</b> Fitzpatrick, 2015.	Pregnant women, in Michigan.	X	X		
<b>Oral Health: An essential component of Primary care. A White Paper.</b> Hummel et al., 2015.	Patients 0-21 years, Southwestern WA.	X		X	
	0-18 years of age pediatric clinic, WA.	X			
<b>Case studies of 8 federally qualified health centers</b> Langelier et al., 2015.	Adult dental services in FQHC in New Hampshire.	X		X	
	All ages, in Rhode Island.	X		X	X
	All ages in MN & WI.	X	X	X	X
	NYU Lutheran Family Health Centers see all ages & school based clinics, day care centers &	X	X	X	X

	dental clinic.				
	All ages, CA.	X	X	X	X
	Comprehensive services for children, limited services for adults, CT.	X		X	X
	All ages, rural PA.	X	X	X	X
<b>Oral Health and the Triple Aim: Evidence and Strategies to Improve Care and Reduce Costs.</b> Snyder, 2015.	Expanding access to care for pregnant women, WV.	X			X
	Expanding access to care for pregnant women, CT.			X	
	All ages, Oregon.			X	
<b>Integration of oral health with primary care in health centers: Profiles of five innovative models.</b> Maxey, 2015.	All ages, Kentucky.	X			
	All ages, MA.	X			X
	All ages, KS.		X		
	All ages, CO.		X		
	All ages, WA.	X	X	X	
<b>Medical Oral Expanded Care (MORE Care) Initiative.</b> Boynes et al., 2017.	Children, in rural PA. A rural health interprofessional program in CO, PA, So C.	X	X		
<b>Case Studies in Oral Health Integration from across the care delivery spectrum: Lessons learned for Massachusetts.</b> Vitzhum and Singh, June 2017.	Plan for dual eligible Medicare & MassHealth, adults with complex health & social needs, MA.			X	
	Early Childhood Caries Collaborative to develop a dental home for young children. MA.	X			
	Children, MA.	X			

**TABLE 3-3** Integration Level Features in Clinical Practice by Type of Oral Health and Primary Care Integration

<b>Level of Integration in M-RMIC</b>	<b>Integration Features</b>
<b>Clinical</b>	<ul style="list-style-type: none"> <li>• Develop appropriate educational materials in a health literate manner</li> <li>• Provide preventive oral health services to children, pregnant women, chronic disease patients, and other target populations</li> <li>• Engage in oral health screening &amp; anticipatory guidance for chronic disease patients</li> <li>• Develop &amp; utilize case management &amp; track referrals</li> <li>• Ask about medical and dental home and last medical/dental visit</li> <li>• Develop &amp;/or coordinate individualized multidisciplinary care plans</li> <li>• Interact in a culturally competent manner</li> <li>• Understand the population needs</li> <li>• Track &amp; follow up on referrals</li> </ul>
<b>Professional</b>	<ul style="list-style-type: none"> <li>• Train primary care team on how to conduct an oral examination and caries risk assessment</li> <li>• Develop a shared culturally appropriate vision for department</li> <li>• Develop /foster interdisciplinary collaborations</li> <li>• Develop &amp; follow clinical guidelines/protocols</li> <li>• Develop an inter-professional governance for the collaboration</li> <li>• Create value for FQHC’s providers and patients</li> </ul>
<b>Organizational</b>	<ul style="list-style-type: none"> <li>• Assure all providers have buy-in to planned collaborations</li> <li>• Develop screening, caries prevention, sealant and other performance metrics</li> <li>• Keep population and patients’ needs central</li> <li>• Develop a dental referral network strategy</li> <li>• Demonstrate supportive leadership</li> <li>• Make cultural competency training available to all providers and staff</li> <li>• Develop appropriate competency management</li> </ul>
<b>System</b>	<ul style="list-style-type: none"> <li>• Interface with public health &amp; community organizations</li> <li>• Determine Community’s needs</li> <li>• Seek available resources to initiate needed programs</li> <li>• Develop programs that meet community’s needs</li> <li>• Demonstrate good community-participatory governance</li> <li>• Develop a positive climate</li> </ul>
<b>Functional</b>	<ul style="list-style-type: none"> <li>• Develop accessible, integrated electronic record systems with clinical decision tools</li> <li>• Systems monitoring &amp; benchmarks</li> <li>• Resource management</li> <li>• Develop needed support systems &amp; services</li> <li>• Provide regular feedback on performance</li> </ul>
<b>Normative</b>	<ul style="list-style-type: none"> <li>• Visionary leadership to develop a dental home initiative</li> <li>• Create a shared vision for optimal oral health for all</li> <li>• Develop a collective attitude with the community</li> <li>• Let community come to know you are a reliable partner</li> <li>• Create a sense of urgency about community’s total health</li> <li>• Build quality features of the collaboration at operational, tactical &amp; strategic level</li> </ul>

## **Integration of Oral Health Content into Health Profession Education and Continuing Education**

The purpose of this section of the environmental scan was to provide “a summary of professional education efforts in both dental and medical education (both professional schools and continuing education) that include information on integration.” This charge was expanded beyond medicine to include primary care health professions to be more consistent with other sections of this report. The charge did not include a focus on health literacy. However, the M-RMIC conceptual model of integration for existing practices and health literacy described in earlier sections of this report was applied to integration occurring in education and continuing education programs.

The context for oral health-primary care integration in health profession education and key events and reports that have been the drivers for these educational changes are described first. Conducting a survey of professional schools to determine the content and extent of their oral health curriculum related to integration of oral health was not part of our charge. However, we reviewed surveys that have been conducted of oral health curriculum content and amount of time devoted to oral health in non-dental health profession programs. We reviewed the published literature of undergraduate, predoctoral, postdoctoral and interprofessional education (IPE) programs that demonstrate integration, as well as descriptions of some government-funded training grants. Evidence of continuing education efforts that pertain to different aspects of oral health integration was assessed primarily from health professional associations’ websites.

### **INTRODUCTION**

One hundred and forty-seven accredited U.S. medical schools belong to the Association of American Medical Colleges <https://www.aamc.org/about> (accessed 6/4/17). In contrast, there are 66 accredited U.S. dental schools, thus many academic health sciences campuses do not include a dental school (ADEA website, <http://www.adea.org/snapshot/> 6/4/17). With a few exceptions, the education of physicians and dentists have occurred separately. The landmark 1926 Report by William J Gies, “Dental Education in the United States and Canada” recommended combining the professions, and making dentistry a specialty of medicine (Gies, 1926). This type of integration did not occur, and even within some universities, medical and dental schools are not located on the same campus. Siloed health profession education programs parallel separate medicine and dentistry healthcare delivery systems, with different practice locations, financing and insurance mechanisms, electronic health records, billing and coding. As will be described in the subsequent section, there is now growing recognition that these siloed

education and patient care approaches need to change to provide comprehensive and integrated patient care.

### Drivers of Change

The last two decades have brought many changes in the healthcare system and a series of interwoven events and policy recommendations that have encouraged medical education and continuing education programs to include aspects of oral health. These events have three interwoven themes. The first is the growing recognition that oral health is a component of overall health and connected to the rest of the body. Pain, infection and inflammation in the mouth can affect other organ systems and vice versa, and oral health problems affect quality of life in many ways. The second theme is that non-dental health providers can have a key role in improving oral health. Traditionally, oral health concerns were not addressed outside of the dental profession. However, the oral health workforce has not reached many disadvantaged and vulnerable populations, including young children. Other health professions could help fill this gap, and have started to do so. The third theme is the rise of curriculum initiatives to advance interprofessional education (IPE) with the goal of advancing interprofessional collaborative practice (IPCP) and improving patient care and health outcomes. The importance of team-based collaborative care, new, large group multidisciplinary delivery systems, and new focus on quality and performance, have fueled these changes in health profession education. Employers want graduates of health professions programs to be “practice-ready,” prepared to work in teams.

A timeline of many of the key drivers of oral health integration in health profession education programs, as a result of these three themes, are shown below in Table 4-1. The timeline starts with the 1995 Institute of Medicine (IOM) report on dental education that recommended greater integration of dentistry with the larger healthcare system. One of the four objectives presented was to “*promote attention to oral health (including the oral manifestations of other health problems) not just among dental practitioners but also among primary care providers, geriatricians, educators, and public officials*” (IOM, 1995).

The 2000 Surgeon General’s Report on oral health brought attention to the need for improved access to dental care for vulnerable and disadvantaged populations and the presence of significant oral health disparities within the United States population. After the Surgeon General’s Report, the medical profession started recognizing that they could play a larger role in their patients’ oral health. There was an increase in training grants, curriculum, policy statements, national conferences, publications and resources to fill the gap in oral health training for medical providers (Douglass et al., 2009a). In 2001, the North Carolina “Into the Mouths of Babes” (IMB) statewide project was initiated to address the epidemic of early childhood caries among children without access to dental care (Rozier et al., 2003). Pediatric primary care providers were trained to conduct oral health screenings, caries risk assessment, parental oral

health counseling, and fluoride varnish applications to young children and received Medicaid reimbursement for providing these services to eligible children. (See IMB Case Study.) The IMB program has become a national model and all state Medicaid programs now reimburse medical providers to apply fluoride varnish <http://www.pewtrusts.org/en/research-and-analysis/analysis/2011/08/29/reimbursing-physicians-for-fluoride-varnish> (accessed 10/30/17). Yet, it was (and still is) difficult for pediatric providers to get the children to needed dental care. The authors of the 2003 IOM report, *Health Professions Education: a Bridge to Quality*, stated the problem succinctly:

“Although the academic environments of the various health professions generally are not interdisciplinary, practice environments are increasingly so, posing a serious disconnect...”

They presented a new vision for health professionals to be educated as an interdisciplinary team to deliver patient-centered care (IOM, 2003). However, according to Rafter and colleagues, the dental profession was not represented on this IOM committee and was considered part of the “allied health professions” (Rafter et al., 2006).

In 2009, six national health profession education associations developed a collaborative to promote team-based care and guide shared curriculum development for dentistry, nursing, medicine, osteopathic medicine, pharmacy and public health. This Interprofessional Education Collaborative (IPEC) subsequently developed and released in 2011 a set of four core competencies and sub-competencies for interprofessional collaborative practice to prepare clinicians across professions (IPEC, 2011). The competencies cover four domains: values/ethics for interprofessional practice, roles/responsibilities, interprofessional communication, and teams and teamwork. This report was updated in 2016 and the authors indicated that during the intervening time period, the 2011 report had over 550 citations in the peer-reviewed literature. In 2016, nine new institutional members joined IPEC (IPEC, 2016). One of the principles recommended in the 2011 IOM report, *Advancing Oral Health in America* was to “enhance the role of non-dental health care professionals.”

In 2011, the AAMC in partnership with Health Resources and Services Administration (HRSA) called for resources to support the integration of oral health concepts into the undergraduate medical education curriculum <https://www.mededportal.org/download/258676/data/ohicallforsubmissions.pdf> (accessed 6/11/17). As a result of this initiative, a set of competencies in eight domains were developed with specific knowledge and skills in each of these areas: General oral health screening; Dental caries; Periodontal disease; Oral cancer and prevention; Oral-systemic health interactions; Public health; Emergency care; and Medical dental interface <https://www.mededportal.org/download/258096/data/ohicompetencies.pdf> (accessed 6/11/17),

<https://www.mededportal.org/download/306716/data/oralhealthinmedicinecomprehensions.pdf> (accessed 6/21/17).

In 2014, some of the dental caries prevention recommendations issued by the U.S. Preventive Services Task Force were that primary care clinicians prescribe fluoride supplements to children whose water supply is fluoride deficient, and apply fluoride varnish to primary teeth of infants and children once they erupt (USPSTF, 2016). Thus, to implement these recommendations, primary care clinicians needed education about prevention of pediatric dental caries, and clinical skills to apply fluoride varnish.

In a 2013 review of IPE accreditation standards in the U.S. for 10 health professions, nine professions had at least one “accountable statement” that was a directive or requirement for an IPE or IPCP learner outcome (Zorek and Raehl, 2013). In 2014, the accreditation bodies from the six founding IPEC association established the Health Professions Accreditors Collaborative (HPAC) and agreed that IPE competencies in the 2011 IPEC report were “fundamental to educational programs in the health professions accredited by the HPAC members” (IPEC, 2016).

In summary, drivers of change have promoted the integration of oral health from two directions, to fill gaps in access to oral health services and gaps in non-dental professionals’ oral health knowledge. The importance of oral health to health and quality of life, the existence of oral health disparities and oral health unmet needs, especially the epidemic of early childhood caries among low-income and minority populations caught the attention of policy makers. Many U.S. government initiatives and policies have paved the way for pediatric primary care providers to become engaged and reimbursed for provision of oral health services and increased access to oral health care. To some extent, policy changes led to changes in practice and the need for oral health education in professional training. However, as will be shown in a subsequent section, the amount of time devoted to oral health in medical school and other health professions’ curriculum at the turn of the 21<sup>st</sup> century was insignificant. To facilitate oral health education in academic health professional programs, curriculum materials and resources had to be created.

The science showing the interconnections between disease in the mouth and the rest of the body, has led to the realization that primary care providers of all types need knowledge about oral health. Non-dental professional organizations have recommended, and accreditation agencies and licensing boards have initiated requirements regarding oral health knowledge of their practitioners. Holistic comprehensive, patient-centered care requires professions to collaborate, and learning to communicate and work together is essential. IPEC, AAMC, USDHSHRSA, IOM and other organizations have written about the importance of interprofessional education and practice and have developed competencies. To facilitate oral health education in academic health professional programs, curriculum materials and resources have been created. Many of



these developments are described in the IOM “Improving Access” report (IOM, 2011) and most recently by Silk (Silk, 2017b).

## METHODS

### Sources of Information for Health Profession Education Programs

Multiple strategies were used to obtain information about professional education efforts. As with other sections of this report, sources of information included a literature search using Medline and Google Scholar. We limited the search to the United States, English language, the time period beginning in 1995, when a major IOM report on dental education was released, and items obtainable via the internet. Descriptions of research projects were included if they were evaluations of relevant educational initiatives. Opinions, commentaries, and educational programs that were planned or of limited duration were excluded.

An initial consultation for conducting the search was obtained from Kathleen McGraw, health sciences librarian at the University of North Carolina at Chapel Hill Health Sciences Library. Key articles and initial search words were identified. The authors then conducted multiple iterative searches in PubMed using various combination of keywords and MeSH terms (Medical Subject Headings) to identify research about general health education in dental schools as well as oral health education in other health care professions. Search words used for other health care settings or professions included interprofessional, “inter-professional”, physician, physicians, medicine, medical, pediatrician, pediatricians, pediatric, “primary care”, “family medicine”, nurse, nurses, nursing, “public health”, pharmacy, pharmacists or MeSH terms such as “Education, Medical”, “Education, Nursing”, “Education, Pharmacy”. Education terms included education, curriculum, program, programs. Dentistry terms included “oral health”, dental, dentistry or the MeSH term “Education, Dental”. The PubMed “similar article” function was used.

Hand searching of references of key articles was conducted, and the PubMed “similar article” function was used. Searches using these keywords were also conducted in Google Scholar to identify highly cited works and articles that had cited identified relevant articles. Hand searching of references of key articles was conducted. Articles were uploaded to a shared F1000Workspace project, and some suggested related references were obtained from this reference management tool.

Surveys were sought regarding oral health education in curricula of different health professions programs, and knowledge and skills obtained during their education by physicians (pediatricians, family medicine, OB/GYN), physician assistants, nurses, nurse practitioners, pharmacists, and students and residents in these professional programs. Involvement of dentists, dental educators,

dental and dental hygiene students as part of an interprofessional education (IPE) programs with primary care providers or students were also viewed. However, IPE materials that focused primarily on why IPE is important or how to implement IPE generally were not considered.

A request was placed on the Dental Public Health list serve that has about 1700 subscribers (personal communication, Dr. Robert Weyant) seeking information about ongoing programs demonstrating effective integration of dental and general health in dental/medical education, continuing education, and clinical practice to promote effective, person-centered care. We indicated that we were particularly interested in U.S. programs or projects that were unlikely to turn up in our database literature searches, as they are not yet published in the scientific literature. Models with any degree of integration on the continuum from referrals among providers in separate practice locations to fully integrated co-located models qualified. Integration of all types, from interprofessional education to clinical care to policy development were of interest to us. Within the programs, we wished to identify examples of how health literacy practices can or are being used in these integration models at the individual or system levels and in between. Following the request was a list of eight questions about the program with a ninth question asking if we could contact the respondent with follow-up questions.

To identify current educational activities in the grey literature, we reviewed the programs for the annual meetings of three major professional dental organization conferences held during spring 2017: the American Dental Education Association, the International and American Association for Dental Research (I/AADR), and the National Oral Health Conference (NOHC). We attempted to meet with people presenting relevant oral or poster presentations or roundtable discussions. Invitations were also sent to meet with KAA and JAW during the ADEA and AADR meetings.

Government sources, particularly HRSA data warehouse website of active grantees conducting predoctoral and postdoctoral education involving medical-dental integration efforts, were reviewed. <https://datawarehouse.hrsa.gov/tools/findgrants.aspx> (and personal communication, Dr. Jennifer Holtzman, Dr. Renee Joskow).

#### Sources of Information for Continuing Education and Continuing Medical Education

We sought continuing educational programs about integration of oral health and primary care anywhere along the continuum from clinical to systemic organization. We contacted key dental organizations that accredit CE providers for advice on how to access this information as well as an organization that provides “joint accreditation” for different health professions.

We had a request for information posted on the list serve of the ADEA Section on Continuing Education with one follow-up reminder of the due date. We indicated that we were interested CE programs that discuss any degree of integration on the continuum from referrals among providers in separate practice locations to fully integrated co-located models. For example, programs about improving communication and collaboration with physicians, nurse practitioners or other non-dental professionals to provide oral health education and patient care would be eligible. CE Programs open to dental and non-dental health professions, especially if professions other than dentistry may obtain continuing education credit, such as CME for physicians, were of interest.

Google was used to search and view many websites of professional healthcare organizations, education institutions, industry and commercial sources, foundations and non-profit organizations for information about continuing education resources. These include enduring resources that are available and can be viewed at any time such as archived or “on-demand” webinars/webcasts/videos/PowerPoint presentations/monographs, and one-time, live, in-person or streamed presentations that have occurred recently or are planned. Federal agencies such as HRSA, the National Institute of Dental and Craniofacial Research (NIDCR) and foundations such as DentaQuest were also contacted as sources of information.

Primary care professional association websites were reviewed for educational resources about oral health or availability of CE courses to learn about oral health or relevant integration activities. We included the websites of the founding 2009 IPEC members and those that joined in 2016. The website analysis included whether the non-dental association website had a dedicated oral health page, an oral health initiative or oral health interest group, links to oral health resources on other websites, or minimal or no oral health information. Oral health activities and information presented were also viewed toward the type of integration this information represented using our M-RMIC conceptual model described in Section 3.

## RESULTS: EDUCATION

### Surveys of Primary Care Providers’ Education in Oral Health

Until recently, most surveys of primary care providers have illustrated the traditional lack of or insufficient education that they received in oral health. Surveys conducted most frequently were with healthcare providers for pediatric patients. Since primary care providers see infants and toddlers much more frequently than dentists, the high prevalence of early childhood caries, especially among children from disadvantaged families, provided a strong rationale for pediatric providers to integrate anticipatory guidance and oral health interventions into their practice (Mouradian et al., 2003). Pierce, Rozier and Vann (2002) conducted a study in 2000 that demonstrated that after two hours of training, pediatric primary care providers could identify

preschool children with cavitated carious lesions with an adequate level of accuracy for screening and referral purposes (Pierce et al., 2002). This key finding provided a further rationale for educating medical providers who see children about oral health.

Survey results from post-licensure practitioners (in practice or residency programs) about their oral health education experiences will be presented followed by surveys assessing oral health content in predoctoral and undergraduate health profession educational programs.

*Physician and Nurse Practitioner Surveys.*

- *Pediatricians.* In 2000, Lewis and colleagues published results of a national survey of pediatricians to assess their experiences regarding oral health. Their random sample was selected from the American Medical Association Master File. Of the 862 respondents, “more than one third reported no instruction in dental health-related subjects in medical school and 42.3% reported no dental health related instruction in their residency training” (Lewis et al., 2000).

Krol reviewed different levels of medical education programs for training pediatricians in oral health from papers published during 1966-2002 (Krol, 2004). At that time, he concluded that the level of oral health training for pediatricians was inadequate. This time period preceded the American Academy of Pediatrics (AAP) May 2003 policy statement that indicated that “pediatricians and pediatric health care professionals should develop the knowledge base to perform oral health risk assessments on all patients beginning at 6 months of age” (AAP, 2003).

Several other studies indicated that there was a lack of oral health training during residency or continuing medical education for pediatricians and family physicians prior to the 2000 Surgeon General’s Report on Oral Health (Douglass et al., 2009a).

The 2006 national American Academy of Pediatrics Survey of Graduating Residents indicated that 73% of residents had <3 hours of oral health training and 35% did not receive any (Casparly et al., 2008). Lewis and colleagues (2009) conducted their second national survey of pediatricians using a random sample of U.S. post-training AAP members in 2007-2008. The goals were to assess current attitudes and practices regarding pediatrician performance of oral health prevention and referral services. The most frequently reported barrier to participating in oral health activities in practice (41% of respondents) was lack of oral health training (Lewis et al., 2009).

Quinonez and colleagues (2014) surveyed a random sample of AAP members as part of the 2012 periodic survey of fellows to examine changes since 2008. Many national initiatives to increase pediatricians’ integration of oral health in their practices had launched in the interim. The majority, 76% reported receiving oral health training during their medical school or subsequent residency or post-residency training, compared to only 36% in 2008. However, only 18%

reported formal education in oral health during medical school, and 70% reported that oral health training was less than 3 hours (Quiñonez et al., 2014).

A 2007-09 study was conducted of pediatric residents enrolled in CORNET, a national primary care practice-based research network of pediatric continuity clinics. The response rate was 73%. These 163 residents were geographically distributed across the country from 28 practices. The goal was to determine if the residents were learning and applying the AAP Bright Futures curriculum's oral health concepts for children below three years of age. One-third indicated no prior training in oral health and 54% reported 1 or 2 prior sessions on oral health. The residents had high self-reported oral health knowledge, but lower levels of perceived oral health skills and confidence, particularly when conducting an oral health risk assessment or identifying dental caries as part of a physical exam. The primary barriers reported to implementing oral health activities into well-child visits were time constraints and lack of knowledge (33%). In this assessment, providing education was not sufficient to result in application of skills and knowledge in clinical practice (Gereige, et al., 2015).

- *Family Medicine.* In 2003, Gonsalves and colleagues (2005) conducted a survey of 464 U.S. family medicine program directors about the oral health curriculum in family medicine residencies. The response rate was 45%. The majority of respondents agreed that residents should be trained to “identify and refer oral health problems” and counsel parents about prevention of dental problems as part of well child care. They were most likely to teach residents to inquire whether a young child takes a bottle to bed (85%). However, when program directors were asked how much time should be devoted to oral health in the curriculum, the mean response was four hours (Gonsalves, et al., 2005).

In 2005, the first online Smiles for Life (SFL) oral health curriculum was released by the Society for Teachers of Family Medicine (STFM). (See Continuing Education section for details.) In 2006, an accreditation requirement (ACGME) for oral health education in family medicine residencies was instituted. Another survey of family medicine residency directors was conducted in 2009. The response rate was 41% with 183 directors responding. The majority, 84%, were aware of the new accreditation requirement, and 90% reported that they provided instruction in oral health. However, 52% devoted only 1-2 hours to this topic, 21% devoted 3-4 hours, and 10% none. The majority were aware of the SFL curriculum (Douglass et al., 2009b).

A 2011 survey of family medicine residency directors included questions about hours and topics devoted to oral health in their curricula. The response rate was 35% with analysis based on 156 respondents. The majority felt that oral health was important and almost all had some oral health in their curricula. As with the 2009 survey, 52% reported 1-2 hours and 45% 3 or more hours devoted to oral health and 74% were aware of STFM's SFL program. Dental caries prevention and care and pediatric screening were the most frequently covered topics. Fluoride varnish was a

topic covered in 58% of programs, but only 24% reported training in fluoride varnish application, and 9% reported routine application of fluoride varnish to pediatric patients (Silk et al., 2012).

- *Obstetricians and Gynecologists.* Curtis, Silk and Savageau (2013) conducted a national survey in ~2011 of 240 obstetrics and gynecology (OB/GYN) residency program directors regarding pre-natal oral health education for pregnant patients. The response rate was 53%. The majority, 62%, of OB/GYN respondents indicated that their program provided no prenatal oral health education, and 32% provided one to two hours. No programs provided more than four hours (Curtis et al., 2013).
- *Pediatric Nurse Practitioners.* According to Hallas and Shelley (2009), pediatric nurse practitioners (PNP) are more likely than dentists and physicians to practice in medically underserved areas. About two-thirds of PNPs provide care to children with Medicaid coverage. Health promotion and disease prevention is part of their routine practice, so they are in a good position to provide recommendations about oral health issues, address concerns and refer patients to a dental home. They stated in their 2009 report that oral health was part of the core curriculum for PNPs. However, the authors indicated that evidence of the effectiveness of the educational approaches was lacking and continuing education about oral health for practicing PNPs was needed (Hallas and Shelley, 2009).

#### Predoctoral Non-Dental Health Profession Programs and Oral Health Curriculum

Surprisingly, few surveys or analyses have been conducted of the oral health curriculum in undergraduate or predoctoral non-dental health profession education.

##### *Medical Education.*

In preparing to develop an oral health curriculum for osteopathic medical students, Skelton and colleagues analyzed the curriculum at the Pikeville College School of Osteopathic Medicine and found that fewer than four hours was devoted to oral health. The content was primarily focused on children's oral health (Skelton et al., 2002).

Mouradian and colleagues, (2005) prior to creating an oral health curriculum for medical students at the University of Washington, reviewed studies published between 1960 and 2004 describing medical education and physician training in oral health. In addition to Skelton's study (above), they found a 1985 survey that found that dental topics were not included in medical institutions surveyed, and another study specific to oral cancer training. A pilot of medical students at the University of Washington revealed low student knowledge of oral health topics, though they expressed interest in learning about oral health.

There are three steps to the United States Medical Licensing Examination® (USMLE®) that a physician must pass to get a medical license. The authors reported that in 2005, step 1 did not include any oral health content, but that steps 2 and 3 did include clinical knowledge and clinical skills, respectively, of the mouth and oropharynx, even though medical school curriculum were not addressing these content areas. Mouradian and colleagues also emphasized that an undergraduate medical curriculum in oral health needed to be reinforced in subsequent residency training (Mouradian et al., 2005).

In 2009, Ferullo, Silk and Savageau (2011) sent surveys to MD and DO-granting U.S. medical schools to assess the status of their oral health curriculum. The authors claimed that this was the first such survey in 25 years. At this point in time, several of the drivers for inclusion (See Table 4-1) were already in place including the AAMC's 2008 report, inclusion of oral health topics on the USMLE exam, the AAP Curriculum on Child Oral Health, and the STFM's SFL curriculum. Their survey response rate was 57% with 58 schools responding. The amount of curriculum time spent on oral health was limited, with 69% reporting fewer than five hours and another 10% offering none. Most of the medical schools were not affiliated with a dental school or dental residency program but presence of dental program affiliation was not a significant factor related to number of hours of oral health in the curriculum. The respondents that reported having at least 1-2 hours in the curriculum were asked about the topics covered. The most frequent topic was oral cancer (82%), followed by oral anatomy, and then oral health and overall health. Only 10% provided any hands-on training (Ferullo et al., 2011).

#### *Pharmacy Education.*

There has been little focus on the extent oral health issues are included in pharmacy education. A survey was conducted of final-year students attending the eight pharmacy schools in California, with students from five of the schools responding. The majority, 90%, agreed/strongly agreed that "limited time is devoted to oral health topics in pharmacy education" and 40% indicated that "oral health was not a topic in any course of my pharmacy education." (Gavaza et al, 2016)

#### *Medicine, Nursing and Pharmacy Education.*

An Oral-Systemic Health Educational Curriculum Survey was conducted among academic deans from medical, nursing and pharmacy schools in English speaking countries. The response rate was low, 23%, the sample size small, with the majority of responses from the United States (n=27). Overall, the inclusion of oral-systemic science was rated as somewhat important by 54% on a 5-point scale with little difference between the three professions. Many obstacles were listed to inclusion of an educational module about the oral cavity and the importance of oral health in ensuring overall health. The majority across the three disciplines, 60%, rated their current curriculum in oral-systemic health inadequate (Hein et al., 2011).

### *Nursing Education.*

Other surveys of nurses, nursing students or oral health content in nursing school curriculum was not found. However, Jablonski (2012) examined the quantity and quality of oral hygiene content in seven nursing fundamentals textbooks for pre-licensure students. Content devoted to oral health and hygiene averaged 0.6% and the quality was very variable including some erroneous or outdated material (Jablonski, 2012).

### *Physician Assistant Education.*

A 2008 survey was sent to directors of 142 Physician Assistant (PA) programs to inquire about oral health content of their curriculum with a 58% return rate. Between 22-32% responded that they were already teaching PA students to examine a child's teeth for cavities, inquire if a child is taking a bottle to bed, assess a child's fluoride intake, and counsel parents about the importance of regular dental visits and tooth brushing, and 30-61% said it was likely that they would. An additional 5-25% said they were unlikely to do these activities. The program directors reported an average of 3.6 hours devoted to oral health with a range of 0-14 hours. The authors presented a suggested oral health curriculum for a PA program (Jacques, et al., 2010).

Langelier, Glicken and Surdu (2015) conducted a follow-up survey in 2014. The survey was sent to directors of 182 PA programs and obtained a 69% response rate. The proportion of programs that included oral health topics in their curriculum had increased to 78%. A wide range of topics was covered. Often these topics were integrated into other subject areas. The most frequent, was the addition of how to conduct an oral examination as part of the teaching of physical diagnosis. However, only a fourth of the programs provided training in fluoride varnish application. Three-fourths of the programs with an oral health curriculum provided 6 or fewer hours of didactic instruction and 72% included 3 or fewer hours of clinical training. There were 43 PA programs that utilized at least some of the SFL curriculum. Some programs that were part of interprofessional education initiatives reported that students learned about oral health with dental or nursing students (Langelier et al., 2015).

### Interprofessional Education (IPE): Surveys of Dental School and Dental Hygiene Program IPE Curriculum and Graduating Dental Students

Interprofessional education (IPE) could be an important prelude to integration of oral health and primary care. There are many current initiatives to advance IPE and interprofessional collaborative practice (IPCP). There is some overlap of these two concepts, but generally, the goal is for IPE to lead to IPCP. Research evaluating the effectiveness of IPE in leading to IPCP has focused on the impact to the individual learner, and changes to practice and health system processes. Missing is the impact on patient health outcomes, health care costs, and linkage between IPE and post-education IPCP (Lutfiyya et al., 2016). Having students learning and working together to achieve the four competencies established by the IPEC (IPEC, 2011) are



useful and important for providing the foundations of interprofessional understanding of each profession's roles and responsibilities, development of mutual respect and shared values, collaboration and teamwork, and communication with patients, families and other health professionals. Learning together about each other's disciplines and gaining team skills may be the first steps towards a willingness to communicate and coordinate patient care across professions. The IPEC competencies do not address specific topical content areas such as oral health. They do not guarantee that medical or other non-dental providers will become more knowledgeable about oral health and include its assessment as part of their activities. However, one would expect that interprofessional communication, collaboration and teamwork would aid this process.

Dental hygienists are very knowledgeable about oral disease prevention and behavior change. They could play a key role in provision of oral health services in primary care settings and IPCP if permitted by state practice acts and licensure. For example, some hygienists in Colorado, where independent dental hygienists do not need dentist supervision, are now practicing within primary care medical settings (Braun and Cusick, 2016).

Surveys have been conducted to determine the extent IPE has been implemented in different health profession programs. Educational experiences involving dental hygiene and dental students are sometimes considered IPE, but more often are considered *intra*-professional education instead. Furgeson and colleagues (2015) conducted a 2014 survey of U.S. dental hygiene directors to assess participation in IPE. The response rate was 33% of 305 programs contacted. A fifth of the programs were at an institution with a dental school, and 28% collaborated with dental schools. Similarly, 21% were at an institution with a medical school, but only 11% reporting collaborating with a medical school. About half of the dental hygiene programs were located at a community or junior college. Most, 90% were located with a nursing school, and collaboration was highest with nursing (50%). The most prevalent joint activities with other disciplines were volunteer (68%), basic science course (65%), communication training (63%) and behavioral science courses (59%). Being in didactic classes together by itself is not IPE unless there is engaged interaction across disciplines. Many barriers and challenges were identified that need to be addressed (Furgeson et al., 2015).

An ADEA Team Study Group on IPE conducted a survey of Academic Deans in U.S. and Canadian dental schools in 2011-12 to assess the status of IPE activities. The response rate was 86% with 62 schools responding. The majority, 39 of 51 dental schools co-located on a campus with a medical school, reported as the top three collaborations with other health profession programs, were medicine, dental hygiene, and nursing. When asked about the type of joint IPE activities occurring, the most common were volunteer activities (66%) with 19 of these programs involving medicine, clinical activities (60%) of which 11 programs were with dental hygiene and 10 with medicine, service learning projects (52%) with 10 medical programs. Other types of IPE

activities such as communication training, standardized patient programs and ethics classes involved six or fewer medical programs. This report included case studies of six schools. The types of activities implemented varied, and many were still in the planning stage. A foundational IPE course with other health professional students was common, but this could be either a required course or an elective. Usually there was some type of small group team-based project or assignment to encourage interaction among professions. Clinical activities might involve a standardized patient or patients selected who had specific chronic conditions or disabilities. Many of the clinical interactions took place in community-based rotations or volunteer mission trips. The article did not discuss whether or to what extent other health professions had the opportunity to learn about oral health (Formicola et al., 2012).

Palatta and colleagues (2015) provided an excellent summary of the development of IPE in academic dentistry over a 20-year period in their 2015 report (Palatta et al., 2015). They also provided results of the 2014 survey conducted by the American Dental Education Association of U.S. and Canadian dental schools about IPE. The response rate was 98% with 62 U.S. schools responding. In this survey, dental students learning or collaborating with other types of dental health professions without any other health professions involved was not considered IPE. While more than 90% of dental schools were offering some type of IPE, only 58% had a formal, university-led and promoted program. About a third of the schools reported that there were ad hoc IPE experiences. The remainder reported being in a planning phase. Of the IPE experiences, 77% had been in place for five years or less. The professions most often participating in the IPE experience were nursing (82%), medicine (75%) and pharmacy (68%). The most common content areas discussed were “the roles/responsibilities of other professions (91.1%) and team skills (80.4%).” Oral health and dental care were not mentioned as specific topics.

Andrews (2017) conducted a 2015 survey of U.S. and Canadian dental schools to assess IPE and interprofessional collaborative practice (IPCP) activities as part of the “Advancing Dental Education in the 21<sup>st</sup> Century project”. Of the 41 programs that responded, 42% had implemented IPE but only 17% had implemented IPCP. The majority used small group case-based activities for IPE and simulated exercises and some patient care with IPCP. The top four skills taught were collaboration, communication, professionalism and management of medically complex patients. Andrews makes the key point that unless students experience IPCP they do not understand how the IPE skills learned will translate into patient care (Andrews, 2017).

There may be differences in what school administrators report and what graduating seniors remember of their educational experience. Questions about IPE have been asked of graduating dental students in the ADEA senior survey annually beginning in 2013 and available through 2016 (personal communication, Dr. Denice Stewart, Dr. Bryan Cook, Mr. Franc Slapar, ADEA 6/8/17). Results have stayed relatively stable during this four-year period. Regarding IPE, seniors were asked how prepared they were to work with other professions. The majority (89%)

indicated that they were prepared or well-prepared. When asked to select from a list the health professions they have interacted with in their educational activities, medicine increased from 9% in 2013 to 18% in 2016. The percent reporting interacting with nursing was greater and increased from 23% to 40% during this period. The seniors were asked the nature of the learning experience. For interactions with medicine, 69% responded lecture which may not be a true IPE experience, 65% volunteer activities, 60% clinical activities, 57% pre-clinical activities, and 34% ethics. Responses were similar for nursing. Finally, students were asked to indicate their level of agreement with the statement: “the learning experience with other health professions students helped me gain a better understanding of the roles of other professions in caring for patients.” The response was favorable; 86% agreed or strongly agreed with the statement.

While many dental students report they have IPE experiences with medical students, the reverse does not apply. A 2008 survey was conducted of all US medical schools about their IPE offerings. The response rate was low, 38% (n=48 schools). Less than 30% of the medical students reported involvement with in IPE experiences (Blue, et al. 2010). Since then, according to the AAMC, the number of medical schools with required IPE has increased dramatically, from 56 schools in 2007-08 to 130 schools in 2014-15

<https://www.aamc.org/initiatives/cir/403572/02a.html> (accessed 6/13/17). The AAMC website also lists the percent of different types of professional programs that required IPE experiences with medical students. In 2014-15, of 126 medical schools responding, only 29% reported that dental schools required IPE experiences with the medical students, compared to 38% from social work, 40% from nurse practitioner and 78% from baccalaureate nursing programs <https://www.aamc.org/initiatives/cir/403580/02d.html> (accessed 6/13/17). This more recent finding for dentistry was similar to that found in the 2008 survey. These findings may reflect the earlier stage of IPE implementation for dental education, and that many IPE dental school experiences are elective rather than required or selected from a menu of options. Almost all dental schools provide some type of IPE, but the format, content, and other participating disciplines vary greatly and few have implemented IPCP.

### Surveys of Health Professions’ Curricula in Progress

The Center for Integration of Primary Care and Oral Health (CIPCOH) based at the Harvard School of Dental Medicine in conjunction with the Harvard Medical School and the University of Massachusetts Medical School, funded by a cooperative agreement with HRSA, has recently surveyed health profession educational programs regarding the integration of oral health in their curricula, as part of or in addition to interprofessional education. The types programs/schools surveyed include:

- Dental schools
- Medical schools
- DO/Osteopathic schools

- Internal Medicine residencies with primary care track
- Geriatric fellowships
- Family Medicine residencies
- Physician Assistant programs
- OB/GYN residencies
- Pediatric residencies
- Medicine/Pediatric residencies
- Nurse Midwifery programs
- Nurse Practitioner programs: Family, Pediatrics, Adult-Gerontology

Analysis is in progress. (Silk, personal communication, 7/20/17.)

### Summary of Surveys of Primary Care Providers' Education in Oral Health

The results of the above surveys show that oral health is increasingly finding a place in curricula of health professional schools and residency programs. Prior to 2000, the topic was almost non-existent in these educational programs. However, the number of hours devoted to oral health remains relatively low, rarely more than a few hours and topics covered are limited.

Development of clinical skills is also limited at the undergraduate and predoctoral levels. As will be discussed later, programs often utilize the online SFL modules as a component of the curriculum. Programs that devote more time to oral health are likely to include oral health-systemic health connections when discussing chronic diseases, teaching how to conduct an oral examination and oral cancer screening as part of physical diagnosis, (adding oral health history questions to the medical history), and fluoride varnish application as part of pediatrics. In spite of new accreditation requirements that include oral health and questions about oral health on medical licensing exams, many barriers for implementation, (i.e., available time, scheduling, physical space, cost, attitudes, able and willing faculty) of oral health curriculum outside of the dental profession remain.

### Published Articles: Oral Health Curriculum in Health Professional Programs

As shown earlier, most educational programs with components that integrate oral health and primary care are relatively new. Descriptions of some of the more mature programs were found in the published literature and are described in this section, first for undergraduate and predoctoral programs, and then for postdoctoral programs. Publications are listed in Table 4-2 in chronological order by first author, with the name of the institution providing the education, the program name or brief descriptor, and the type of health professional workforce or trainees participating. Other information is available on websites and other sources or as part of continuing education materials described in later sections.

To put primary care health professional educational programs in the context of oral health integration, the six types of integration proposed in the M-RMIC and Health Literacy conceptual model developed to assess existing practices and application of health literacy principles (see Sections 1 and 3) were applied. Table 4-3 provides examples of different types of oral health integration that pertain to educational programs. These range from non-dental professionals learning to provide oral health clinical services in a stand-alone oral health module to large, multi-disciplinary community health initiatives. . Although the list of six types of integration implies a hierarchy of increasing integration, within educational programs, the advent of IPE programs does not always occur with planned oral health clinical integration. Programs designed for a specific group of learners may not include any professional integration. Most new programs and initiatives probably needed some elements of organizational, normative and functional integration such as leadership to get started, but may not be described in brief publications. System levels of integration are even less frequently discussed in publications, but examples include accreditation and licensing boards requiring oral health content in the curriculum of health professional educational programs and licensing exams. Educational programs are described, with some exceptions, in chronologic order. Evolutionary development is apparent and more comprehensive examples of integration occur over time.

*Oral Health in Undergraduate and Predoctoral Primary Care Education.*

- *Medical Education.* After the Surgeon General’s report was published, Skelton and colleagues (2002) conducted a literature review of non-dental health providers and integration of oral health in practice and education. Their review indicated minimal knowledge and very little integration, with the exception of a few medical schools with dental courses in their curriculum and a few schools (e.g. Harvard and Columbia) that conducted basic sciences courses for medical and dental students together. (Taking courses together does not, in itself, involve integration unless there is also interaction and reflection.) Subsequently, with knowledge of the considerable oral health needs in rural Appalachian Kentucky the University of Kentucky College of Dentistry (UKCD) and the Pikeville College School of Osteopathic Medicine (PCSOM) developed an oral health curriculum for the osteopathic medical students. The 16-hour curriculum was delivered during a two-day workshop and included oral health clinical diagnosis and case scenarios. UK dental faculty were involved though it incurred costs for their travel expenses. Future didactic sessions were planned using distance learning technology (Skelton et al., 2002). Thus, this early oral health educational integration involved clinical integration and required organizational integration on the part of the two schools to plan the program, work out the logistics, and arrange for funding. However, there was little professional integration on the part of the osteopathic school. The students’ exposure to dental professionals was only due to the dental school faculty providing some of the instruction.

The University of Washington (UW) embraced the importance of oral health for professionals outside of the dental school curriculum early on. After identifying a deficiency in oral health

content in their undergraduate medical curriculum, Mouradian and colleagues (2005) developed an oral health curriculum for medical students beginning in 2003. They developed learning objectives for oral health knowledge and attitudes and competencies for three key skills - screening for oral disease, counseling patients on oral disease prevention and risk factors and referring patients to dentists for needed care (Mouradian et al., 2005). These components focused primarily on clinical integration with some aspects of professional integration regarding physician collaboration with and appropriate referral of patients to dentists.

In 2006, as part of a study to examine issues in dental education funded by the Josiah Macy, Jr. Foundation, (the Macy Study) a panel was convened to discuss "...curriculum and clinical training in oral health for physicians and dentists." They focused on the need for common curricula in oral-systemic health and competencies that both professions needed for interprofessional communication, education and collaborative practice. Specific cross-cutting knowledge, attitudes and skills for both professions were described along with specific oral health learning objectives and competencies for medical students. Examples of how to incorporate oral health content into the medical curriculum to correspond with the oral health objectives were provided from the UW School of Medicine. Educational methods used by different institutions to implement these objectives were described. They varied by content and type of learner and ranged from didactic sessions with little professional interaction to interprofessional experiential activities. Patient-based cases were often discussed in small group sessions, by role-playing or with simulated patients. Joint service learning activities were also utilized. Evaluation was based on self-assessment, journaling, direct observation by faculty and objective-structured clinical examinations (OSCEs). Some schools had rotations for medical students in dental clinics either in an affiliated dental school, hospital dental clinic, private dental office or community health center with dental clinics. The Macy Study authors concluded that the medical and dental professions should have a shared responsibility for oral health. These need to begin with curricular changes and shared experiential learning for medical and dental students. (Formicola et al., 2008; AAMC Report, 2008).

Other institutions developed some innovative new educational approaches that were elective rather than part of the core curriculum, and more effective at implementing IPE than oral health integration. For example, at Dartmouth Medical School, students completed self-selected community oriented projects as part of a family medicine clerkship. Bonafede, Reed and Pipas (2009) listed the 47 community projects selected in 2005-06. The authors specifically mentioned that some topics like oral health that were not covered in traditional courses were included this way. However, only 6% of the community projects involved oral health, so only a few students had exposure to this topic (Bonafede et al., 2009).

The University of Massachusetts Medical School implemented a half-day oral health interclerkship for third-year medical students taught by family medicine and dental residency

faculty. The online Smiles for Life (SFL) oral health modules were used as the basis for the curriculum followed by hands-on small group sessions. Changes in pre-test and immediate post-test oral health knowledge were favorable, but pre-test to 6-month post-test knowledge change was much more modest after this relatively short, one-time exposure with limited clinical and only faculty-level professional integration (Silk, et al., 2009).

In contrast, Rosenheck and colleagues (2012) described the creation of a Department of Dental Medicine within the University of Medicine and Dentistry of New Jersey (UMDNJ) School of Osteopathic Medicine (SOM). The department contained faculty from the UMDNJ Dental School and developed a new oral health curriculum with the SOM. The oral health modules were integrated into the second, third and fourth years of the osteopathic medical school curriculum. As part of the curriculum, second year medical students shadowed senior dental students providing dental patient care, with time for a debriefing and question-and-answer session afterwards (Rosenheck et al., 2012). Clinical and organizational integration occurred, and at the faculty level, professional integration. Student integration occurred at a lesser extent.

- *Nursing and Nurse-Practitioner Education.* After the 2011 launch of IPEC core competencies, there was increased attention devoted to IPE and reporting of program implementation. Dolce, Haber and Shelley (2012) reported the development of the Oral Health Nursing Education and Practice (OHNEP) program at New York University (NYU) College of Nursing and College of Dentistry. This was a national initiative to integrate oral health into undergraduate and graduate nursing curricula and develop best practices for clinical settings. Many partners were involved including the National Interprofessional Initiative on Oral Health (NIIOH) consortium. The program was launched in 2011 at a National Invitational Nursing Summit. The first steps included a train-the-trainer approach, and development of best practices. The SFL curriculum was used as a key resource (Dolce et al., 2012). This educational development was significant because, as the authors reported, there were 3 million licensed registered nurses and about 140,000 nurse practitioners in the U.S. workforce that could play a major role in oral health disease prevention and health promotion. The aims of the OHNEP program and national nursing agenda included all levels of integration including policy changes that would impact nursing licensure, accreditation, educational competencies, and nursing practice.

The NYU Colleges of Nursing and Dentistry had previously established a unique, close organizational relationship in 2005. One of the many collaborative outcomes was the creation of an innovative, nursing faculty practice (NFP). This nurse practitioner-managed primary care practice was established in the lobby of the NYU College of Dentistry. The NFP created an educational environment to focus on oral-systemic health and team-based care. Dental and nurse practitioner (NP) students shared experiences rotating through the NFP, and together assessed the patients' needs and developed treatment plans. The NP students learned to conduct

an oral health assessment as well as a physical exam, and if needed, refer the patient for dental care. About a fourth of the dental patients at NYU “did not have or did not access a usual source of primary care” and could be referred to the NFP. Many nursing-dental collaborations developed and 20 nursing and dental courses benefited from faculty teaching in each others’ programs (Haber et al., 2014).

Another important innovation developed at NYU was to add an oral health component to the traditional steps performed in the physical assessment of the head, ears, eyes, nose and throat (HEENT), adding the “O” component for oral cavity assessment. Thus, HEENT became HEENOT for the physical exam performed by NP and nurse-midwife students and applicable to other primary care professions. Changes were made to the electronic health record to document the clinical findings as well as to add oral health questions to the health history. In addition, in the NYU pediatric nurse practitioner (PNP) program, the PNP and dental students have rotations together at a Head Start Center. The dental students teach PNP students how to complete an oral assessment and apply fluoride varnish. The PNP students teach the dental students how to use motivational interviewing with parents and manage young children (Haber et al., 2015). These innovations at NYU exemplify multiple types of integration.

According to Dolce, nurses can play an important role in improving oral health care, but nursing educators need guidance to incorporate oral health into the baccalaureate nursing curriculum. She developed a faculty toolkit based on nursing competencies described in the 2008 *The Essentials of Baccalaureate Education for Professional Nursing Practice*. Each of the nine domains was aligned with one or more of the four interprofessional collaborative practice competencies developed in 2011 by the IPEC (IPEC, 2011). Examples of how oral health can be integrated into each domain are provided in this toolkit (Dolce, 2014).

Dolce and colleagues also developed an online oral health toolkit for interprofessional education as part of the *Innovations in Oral Health (IOH): Technology, Instruction, Practice, and Service* programme at Bouvé College of Health Sciences, Northeastern University (Dolce et al., 2017). The Innovations in Oral Health Toolkit includes step by step instructions from preparing to implement curriculum change, assessing baseline oral health knowledge and skills, to conducting workshops to teach oral health clinical, skills, conducting simulations and case-based learning. (<https://www.northeastern.edu/oralhealth/toolkit/>)

- *Pharmacy Education.* In the United States, little has been written about the community pharmacists’ role or education regarding oral health though they may be asked for advice from those with a toothache or other dental conditions. They are also in a good position to educate patients about the xerostomic side effects of many medications and the link between dry mouth and dental caries. Guidance on fluoride and oral hygiene products and pain medications are certainly part of their role (Cohen, 2013). Some dental schools such as the U of Minnesota,



Creighton and UNC include interprofessional education opportunities for dental students with pharmacy residents or faculty providing a medication consultation for their dental patients. (University of Minnesota: <https://www.healthtalk.umn.edu/2015/11/18/pharmacy-and-dentistry-students-come-together-to-solve-common-problem/>; Creighton: <https://healthsciences.creighton.edu/news/pharmacy-dental-students-collaborate-clinic>; UNC: Weintraub, personal communication)

- *Physician Assistant Education.* Curriculum innovations to include oral health for Physician Assistant education were described in several publications (Bowser et al., 2013; Berkowitz et al. 2015 and 2017; Nicely, 2016). These three PA programs provided clinical integration and varying degrees of professional and organizational integration.

At the University of Colorado PA program, the interprofessional oral health curriculum spanned all three years of the PA curriculum. Oral health concepts were presented in the first year. A lab experience followed that paired PA students with third-year dental students and faculty who provided them instruction to provide oral health education and prevention, diagnosis, physical exam skills and fluoride varnish application. In the second year, a pediatric dentist provided the PA students with didactic content to recognize and treat oral health issues encountered in primary care. In the third year, they received training to bill Medicaid for oral health services as a practicing PA. The PA students also learned how to provide an appropriate dental referral. The electronic patient record system was modified to log oral health procedures performed (Bowser et al., 2013).

Similarly, the Boston University School of Medicine PA Program, in collaboration with the School of Dental Medicine faculty, presents an oral health education curriculum for PA students. After initial didactic material was presented, PA students learned how to perform an oral health screening, and provide patient education and appropriate referrals. Dental faculty, a dental fellow and a dental student taught the skills (Berkowitz et al., 2015). In a follow-up publication, the authors described subsequent components of the curriculum that included geriatrics, pediatrics and a fluoride varnish practicum. The SFL curriculum was utilized for some of the foundational material. Dental students demonstrated the fluoride varnish application process for the PA students. Two simulated exercises were used to provide additional skills. One simulated patient had mouth pain and students had to diagnosis a dental abscess. The other situation was of a parent of a two-year old and the student needed to educate the parent about good oral hygiene practices, regular dental visits and fluoridation. PA students also had an opportunity to shadow dental students to learn about dental procedures (Berkowitz et al., 2017).

At a PA program in Virginia (school not mentioned), students received an 18-hour oral health curriculum over the course of a week. It included SFL components, lectures, a fluoride varnish application lab, a problem-based learning lab and clinical experiences and observation in a dental

clinic to view oral lesions in volunteer patients. Dental providers and residents provided some of the instruction (Nicely, 2016).

*Oral Health as Part of Interprofessional Education (IPE).*

At Boston University, the Schools of Public Health, Medicine and Dental Medicine, along with five local community health center partners, developed a course for interprofessional teams of students to work together on a community health project. The course focused on developing leadership, problem solving and collaborative organizational skills. Of the 10 team challenges listed for 2009-2010, one team tackled the high prevalence of early childhood caries (McCloskey et al., 2011). This elective course involved IPE, but very few non-dental students had an opportunity to learn about oral health, and very few dental students participated.

Two sets of case studies of new IPE efforts were described by Aston and colleagues (2012) and Formicola and colleagues (2012). Western University of Health Sciences (WesternU) was included in both reviews. Their IPE activities engaged students in nine health professions including dentistry. At WesternU, leadership and support from the college deans included construction of a new Health Education Center for this university-wide initiative. A three-phase IPE program was designed. Phase I included a case-based curriculum with small group discussions. Phase II focused on patient safety and teams discussed various scenarios. In phase III, students worked together to provide collaborative, team-based care in the WesternU Diabetes Institute (Aston et al., 2012). In the Aston review, it was not specifically stated whether the non-dental students at WesternU learned about oral health, however in a more recent paper, Andrews reported that dental services have been incorporated into the Diabetes Institute. The interprofessional healthcare teams include oral health as part of managing diabetic patients (Andrews EA. 2017).

The report by Formicola and colleagues (2012) was a summary of the status of IPE in U.S. and Canadian dental schools undertaken by the ADEA Team Study Group on IPE. This activity followed the 2011 ADEA annual meeting that offered IPE as its theme. Best practices were described from six dental schools: WesternU, Medical University of South Carolina (MUSC), University of Colorado, Columbia University, University of Minnesota, and University of Florida. The focus of the assessment was meeting the four domains for IPEC core competencies. It was difficult to determine to what extent each program demonstrated oral health integration into a common curriculum or included oral health clinical skills in IPE activities (Formicola, et al., 2012).

A multidisciplinary educational approach was developed at the Bouvé College of Health Sciences at Northeastern University. The “Innovations in Interprofessional Oral Health: Technology, Instruction, Practice and Service” (Oral Health TIPS) program was designed to provide IPE across the Bouvé Schools of Health Professions, Nursing and Pharmacy and

integrate oral health into primary care. SFL modules were used in courses and oral health competencies in addition to the IPEC core competencies were adopted. An important component in the Oral Health TIPS program, rarely mentioned in the descriptions of other educational programs, was faculty development. A Dean's seminar series provided opportunities for faculty and students to learn about current issues in oral and systemic health. Faculty from the nearby Harvard Medical and Dental Schools participated in didactic sessions, and interprofessional faculty and dental, medical, NP and pharmacy students discussed problem-based cases, particularly regarding the treatment of older adults. The authors also provided the example of the Program of All-inclusive Care for the Elderly (PACE) to illustrate how dental care is integrated with other geriatric care. In PACE, medical, dental and behavioral health fellows learn and practice together in the care of older adults (Dolce et al., 2014). This publication was one of the few to describe integration in the care of older adults, as most focused on pediatric populations.

Also at Northeastern University, a Nurse Practitioner-Dentist model was established in partnership with the Harvard School of Dental Medicine (HSDM). The clinical practice site is in the nearby Harvard Dental Center Teaching Practices in HSDM. Faculty NPs and dentists supervise the collaborative practice of NP and dental students who provide care to adults at least 65-years old who have one or more chronic health conditions, particularly diabetes and hypertension. SFL components were used for part of the curriculum. The students provide diagnoses, interdisciplinary treatment plans, preventive interventions, patient counseling regarding the patient's oral-systemic disease connections and their health behaviors, and make referrals as needed. In addition to clinical and professional integration, organizational, functional and normative integration was needed to develop the partnership between the two schools, design and implement the curriculum, construct a private examination room with dental and medical equipment, configure the electronic patient record, and arrange scheduling and workflows (Dolce et al., 2017 in press).

More recently, Gordon and Donoff (2016) presented a summary of IPE barriers and solutions using case studies from seven North American dental schools (University of Toronto (UT), NYU, University of Alabama (UAB), University of Illinois, Chicago (UIC), Meharry and Vanderbilt, University of Washington School of Dentistry, WesternU's College of Dental Medicine and PA Program.) Some innovative approaches to IPE were described such as the UT program where dental students interact with paramedics during a simulated medical emergency in a dental office. IPE formats involved jointly conducting a patient assessment of standardized patients (NYU), learning how to perform baseline screenings in each other's disciplines (UAB), solving community needs (Meharry and Vanderbilt), and construction of referral letters to other types of providers (WesternU). At UW, reflection papers were used to assess competence in IPE/ICP. These IPE approaches suggest elements of clinical and professional integration. The activities at UIC provide examples of organizational and normative integration that included the

establishment of a Collaborative for Excellence in IPE with the seven health sciences colleges, a university strategic plan for IPE and administrative support, and development of campus-wide activities (Gordon and Donoff, 2016).

*Dental Hygiene Education and Oral Health Workforce Changes.*

The American Dental Hygienists' Association released a white paper in 2015, "*Transforming Dental Hygiene Education and the Profession for the 21st Century*" (ADHA, 2015). In some parts of the country, the education and scope of practice for dental hygienists has been expanded and the type of supervision required changed so new types of hygienists can practice as part of an expanded health care team. For example, California has created the Registered Dental Hygienist in Alternative Practice (RDHAP). These California hygienists have additional education and practice requirements for RDHAP licensure. They can practice in settings outside the dental office such as schools and homebound residences without dentist supervision if there is an established relationship with a dentist for referral and the RDHAP has received a prescription for hygiene services from a dentist or physician [http://leginfo.legislature.ca.gov/faces/codes\\_displayText.xhtml?lawCode=BPC&division=2.&title=&part=&chapter=4.&article=9](http://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=BPC&division=2.&title=&part=&chapter=4.&article=9) (accessed 10/30/17). The RDHAPs are reaching many underserved populations. Similarly, Oregon created an Expanded Practice Permit for qualified hygienists to practice in "limited access" regions or populations without supervision of a dentist.

IPE is now an expected part of dental hygiene education and accreditation standards reflect the changing delivery system. Program accreditation now requires graduates to be competent to "deliver optimal patient care within a variety of practice settings and meet the needs of the evolving health care environment." Battrell, Lynch and Steinbach (2016) reported that only 18 percent of dental hygiene programs were co-located within a dental school or on a health science campus with other health professions, limiting IPE opportunities (Battrell et al, 2016).

Dental therapists are a type of mid-level dental provider that performs some restorative as well as preventive services in many countries. In the U.S., they were first employed in rural Alaska to provide care for Native American tribes with dentist guidance at a distant site using telehealth. Minnesota was the first state to authorize dental therapists and the Commission on Dental Accreditation (CODA) has approved national education standards for dental therapy programs. Maine and Vermont have authorized dental therapists and other states are considering it (Koppelman and Singer-Cohen, 2017). Dental therapists treat all age groups and work in the public and private sector with some of their patient base being underserved or low-income populations. For example, they are employed by HealthPartners in Minnesota (see case report in Section 5). Future developments may bring different types of oral health providers in integrated medical-dental settings.

### *Oral Health in Postdoctoral Education.*

Four published articles described educational experiences primarily for residents in family medicine, pediatrics or OB/GYN. These programs focused on caring for pediatric populations or pregnant women (Mouradian et al, 2003, Graham et al., 2003, Jackson et al., 2015; Silk et al., 2017). Dental professionals usually conducted the oral health training. A key component of the medical residency programs was identification of a place to refer patients for dental care. Building referral networks and systems and developing the needed interprofessional collaboration and communication processes are an important component of the educational process, and necessary for application to improved patient care. Thus, both clinical and professional integration were apparent in these programs. However, without higher levels of integration, obtaining successful outcomes from referral processes remain challenging.

For example, Mouradian and colleagues (2003) described a program that began in 2001 to educate family medicine residents and faculty at the University of Washington Affiliated Family Practice Residency Network. This network consists of 15 training sites across a wide region that includes Washington, Wyoming, Alaska, Montana and Idaho (WWAMI). The educational program was a partnership that included the Department of Pediatric Dentistry and community dentists who assisted with training. A referral network with local dentists was developed so patient referrals for dental care could be operationalized. A dental-medical-educational team developed five oral health modules that included didactic material such as normal dental development and common oral pathology, as well as a section on collaborating with dentists. Dental faculty and UW pediatric dentistry residents provided the didactic training and local dentists provided hands-on training for fluoride varnish application (Mouradian, Schaad et al., 2003b).

At a university hospital affiliated with the University of Washington, Graham and colleagues (2003) developed a program to educate pediatric primary care providers about oral health for pediatric residents, clinic nurse practitioners and attending staff. A pediatric dentist provided the training. Dental faculty and residents helped to reinforce the content. Since this hospital did not provide pediatric dental care, patients were referred to the University of Washington dental school and the Children's Hospital and Regional Medical Center. These primary care collaborations with dental providers had not existed previously. However, it was noted that going to another location for dental care was a barrier for families and many children did not get there (Graham et al., 2003).

At the University of North Carolina Schools of Medicine and Dentistry, a prenatal oral health program (pOHP) was developed to educate both medical and dental professionals about the oral health needs of pregnant women, and increase the ability to provide them with preventive services and referral to dental care. Sessions for faculty and OBGYN residents, and medical students on their OB/GYN clerkships included grand rounds led by a pediatric dentist and an

obstetrician and gynecologist. A protocol was developed for rapid referrals of women without a dental home and/or urgent dental needs to the dental school. At the dental school, dental students, and subsequently dental hygiene students, received information about perinatal oral health and subsequently cared for pregnant women referred by the School of Medicine and elsewhere in the prenatal oral health clinic. During a 12-month period, 126 pregnant women were referred to the dental school prenatal clinic, but only 44% came to their initial appointment and few returned for additional care. Even with clinical, professional and organizational integration on the part of the medical and dental programs, there were still barriers to overcome for the women to obtain much-needed dental care (Jackson et al., 2015).

Silk and colleagues (2017) recently reported results of a regional state-based educational model that began in 2011 and was used successfully to recruit and train students and residents in non-dental clinical training programs and 415 primary care practices to implement oral health services across six New England states. The 52 clinical training programs in this region were contacted to be part of the initiative. These included 26 pediatric and family medicine residencies, 11 medical schools and 15 physician assistant schools. An education coordinator trained residents using SFL Module 6. Medical schools were at different levels of readiness for oral health curriculum adoption. Some incorporated the training in various ways that fit their needs. Some PA programs used on-site faculty, others enlisted dental providers, and some used SFL modules without in-person training. As a result, 44 of the 52 programs had or added oral health training and 35 programs were “adding or evolving fluoride varnish training.” Dental hygienists provided the training for many of the primary care practices. Metrics were collected to monitor outcomes. The majority of family medicine (87%) and all the pediatric residency programs taught fluoride varnish application, and where it was taught, the majority of learners were routinely applying it. This skill was only taught in about a third of the medical schools and half of the PA programs. Nevertheless, the number of 0 to 5-year old children enrolled in Medicaid who received preventive oral health services by a non-dental provider in Connecticut, Maine and Massachusetts increased dramatically from 2011-2015. The other three states were added later (Silk et al., 2017). This initiative incorporated clinical and organizational integration components. Other than dental professionals providing some of the training, there was little professional integration. Medicaid reimbursement was an important system integration component. Aspects of functional integration such as modification of electronic health records and implementing new billing codes were both facilitators and barriers. States benefitted by sharing a website, training materials and trainers.

The Oral Physician Program is a one-year hospital-affiliated dental residency program to train dentists to provide aspects of primary care. It was established at the Cambridge Health Alliance Windsor Street Health Center in 2010 with additional sponsorships by the Harvard Medical School and School of Dental Medicine (Giddon, 2012).

### *Summary of Published Literature.*

The published literature revealed a wide range of educational programs. Some curricula were developed for a specific group of learners, most frequently medical students, followed by nursing and NP students, and PA students. Some of these programs are taught by dental residents or faculty, engage dental students in peer teaching, or are part of an IPE experience that had a dental component. Some of the attempts tended to isolate oral health from the rest of the curriculum into a separate time block, workshop or multi-day course. Approaches that are more comprehensive have woven oral health into existing parts of the curriculum over multiple years. An oral examination would be part of a sequence on conducting a physical exam. Oral pathology would be part of a pathology sequence or oral cancer part of an oncology sequence. Clinical oral health skills most frequently taught were designed for pediatric patients – screening, caries risk assessment, fluoride varnish application and referral. As in practice, if a dental clinic was not within the same institution, a dental referral was more successful if networks with dental practices were established. Non-dental post-doctoral programs discussed this referral issue, especially if the program was not co-located with a dental school or residency program.

IPE initiatives are growing, at least in part because of IPE accreditation standards for health profession programs. Many new healthcare delivery systems are likely to want to hire graduates who are prepared to practice team-based care in large group practices, community clinics or hospital settings (Bailit et al., 2016). Educational programs need to prepare students for these work environments. These environments are different from traditional “solo” dental practices. Meeting IPE core competencies may not satisfy the need for oral health integration, but it serves the important functions of having students from different professions learn about each other’s roles and responsibilities, communicate and collaborate to enhance patient care. If dental and dental hygiene students and dental residents are included in IPE activities, then it is a positive step forward.

Literature was only included if it described specific programs, not, simply the need for or how to implement IPE activities. The published literature on programs implementing oral health in primary care education was relatively small. It is apparent that oral health champions are needed for these activities to happen. Mouradian and colleagues at the University of Washington and Silk and colleagues in the Northeast have helped guide the process for medical education. Fulmer, Haber, Dolce and colleagues at NYU, Northeastern and Harvard have been leaders for the nursing profession. Faculty can add content to their individual courses. However, university or institutional leadership and support for organizational integration is needed to initiate and sustain activities, and provide funding for functional aspects of integration. Continued system integration will help to scale up and disseminate these initiatives. With the exception of locations such as New England, Washington, and North Carolina, more comprehensive educational integration initiatives are relatively isolated in different settings around the country.

## HRSA-funded Training

The Health and Resources and Services Administration (HRSA) has actively promoted oral health as part of overall health with their “Integrating Oral Health and Primary Care Practice (IOHPCP) initiative. (<https://www.hrsa.gov/oralhealth/>) Many HRSA bureaus support this initiative. The Bureau of Health Workforce, Oral Health Workforce Development Programs, fund many different types of training programs. The HRSA data warehouse website was used to obtain information about institutions receiving grant awards for predoctoral and postdoctoral oral health training programs in general, pediatric, and public health dentistry and dental hygiene. (<https://datawarehouse.hrsa.gov/Tools/FindGrants.aspx>)

The overall goals of the programs are to improve access to and the delivery of oral health services to underserved, vulnerable populations. For postdoctoral training, the funding opportunity announcement for 2015 expected applicants to demonstrate “partnerships with primary care delivery organizations and other community-based organizations” and “Collaborative practice across dentistry and other health disciplines.”

The relevant HRSA-funded programs are described separately for predoctoral and postdoctoral programs.

### *HRSA-funded Predoctoral Training.*

The HRSA website lists 25 institutions that were awarded predoctoral training grants in general, pediatric and public health dentistry and dental hygiene in 2017. HRSA allocated these awards across 18 states. Abstracts were available for 22 applications. The abstracts were viewed to see if they described professional or clinical integration, multiple types of health professional students with opportunities for experiential learning together, and for non-dental health professional students to learn about oral health.

From the limited information available online, 17 of the programs did not appear to have elements of integration of oral health with primary care providers. They were designed primarily to improve the training in pediatric dentistry for dental students, and in three programs, dental hygiene students were also included. One program focused on developing a curriculum for expanded function dental hygiene, and another, dental therapy/advanced dental therapy.

Some of the programs planned expanded clinical curriculum that include rotations in community-based clinics. Some mention collaboration with a Department of Medicine or pediatric clinic where there might be an IPE experience. For example, Boston University will be collaborating with the Department of Pediatrics at Boston Medical Center to enhance the existing pediatric dental curriculum. WesternU’s application indicated that there was a need for integrated primary health care services, but did not describe how this would occur. Some



programs mention IPE without accompanying detail. Tufts planned interprofessional community service-learning, but did not describe which health professions would participate. UCSF's application has in its title, "collaborative training of health care providers." Health care providers in dentistry, dental hygiene, medicine and nursing will be participating at the primary care teaching sites. Most of the learning objectives are about children's oral health. Some objectives are specific for dental hygiene students. It is not clear if dental, medical and nursing students are also participating.

There were five institutions where the abstracts indicated there might be aspects of clinical, professional and organizational integration with primary care taking place.

The University of Minnesota School of Dentistry's application described a Rural Oral Health Program that would bring together medical, dental, and dental therapy students to provide integrated services and team-based oral health care in rural practice settings. One of the partners is the Rural Physician Associate Program, a program for third year medical students.

A.T. Still University, Arizona School of Dentistry and Oral Health's proposal has a focus on children with special healthcare needs. Their abstract describes dental students training with ATSU's osteopathic medical and physician assistant students in community sites with several IPE formats including small-group sessions, IPE service learning projects, and tele-health technology.

Columbia University College of Dental Medicine (CDM) plans to expand their "existing clinical interprofessional primary practice experience in CDM dental clinics for 80 3rd year dental students and up to 10 primary practice nursing, 5 social work, and 3 nutrition students." It is not reported if the students will evaluate dental patients together and develop a common treatment plan or if the non-dental students will be learning about oral health.

The Medical University of South Carolina presented a program called ROADTRIP, Rural Oral Health Advancement and Delivery ThRough InterProfessionalism. They will work with community partners to develop a graduate-level certificate program in safety net oral health practice. They will be working with several community partners and plan to have their primary care programs adopt the oral health training. In addition to dental students enrolling in this program, they anticipate "15 NP, 15 PA, 9 pediatric residents and 60 dental students working in teams to implement a community-based participatory project for improving the oral health of underserved children on the Charleston sea barrier island communities."

Texas A&M University Baylor College of Dentistry's is the only one with a specific goal of "integration of oral health within the broader health care delivery system." They are "offering non-dental workforce education/training in basic oral health" though the specific health

professions are not specified. In partnership with the University of Texas Southwestern Medical School, dental students will be part of an interprofessional team delivering services at the North Dallas Shared Ministries that has a co-located medical and dental clinic.

*HRSA-funded Postdoctoral Training.*

The HRSA website listed 20 recipients for the 2017 Post-doctoral Training in General, Pediatric and Public Health Dentistry awards. These awards were spread across 12 states. Abstracts were available for 15 programs. Limited information was available from the abstracts. Five programs described the addition of clinical components to pediatric dentistry residency training such as more experience providing care to those with special needs, or adding public health training or an MPH degree. These programs were not considered examples of integration of oral health into primary care. Of the remaining 10, there was evidence of clinical and professional integration with dental and non-dental health professionals having opportunities to train or work together. Seven training programs were for pediatric dentistry residents. However, they included at least some training with pediatric residents (3 programs), AEGD or GPR residents and primary care providers (2), behavioral nutrition students (1) and other unspecified IPE experiences (1). The program at UCLA included several types of students training together: AEGD residents, pediatric dentistry and pediatrics residents, and family NP students. In the New York Medical College Program, GPR dental residents were to be trained and subsequently practice with family medicine residents in patient-centered medical homes. The UIC program described pediatric dentistry residents teaching primary care providers, medical residents and dental students. Three programs emphasized the IPE nature of the training, but it was not possible to tell what level of integration would occur. Four programs provide care to pediatric populations, and one both children and older adults. One provided care across the lifespan and others did not specify. (<https://datawarehouse.hrsa.gov/Tools/FindGrants.aspx>)

*Summary of HRSA-funded training programs.*

Based on the limited information in the abstracts submitted, many programs include IPE and some institutions proposed plans to integrate aspects of oral health in primary care. Most of these training programs are less than five years old and, with rare exceptions, do not have outcome measures. Based on presentations given about some of the programs at the 2017 National Oral Health Conference, some of the programs are in the planning or early implementation stages. A few programs planned to include process metrics to measure numbers of patients seen or services provided. Almost all, if not all of the predoctoral programs described as their goal to increase the ability of students to care for children from birth to age five, or more generally, children. Six programs also targeted children with special health care needs, and one program included adults with disabilities. Of the predoctoral programs, only five of the 22 abstracts viewed, 23% described significant aspects of oral health integration taking place in primary care. In contrast, two-thirds of the postdoctoral programs described evidence of integration with primary care. More mature programs, not discussed, may have received earlier cycles of HRSA funding.

External funding is a key system-level element of primary care integration, particularly if the funder encourages or requires it.

## RESULTS: CONTINUING EDUCATION

This next component of the environmental scan continues two interwoven themes. As seen in the findings from the literature describing undergraduate, predoctoral and postdoctoral health profession education, inclusion of oral health in non-dental professional education programs and IPE programs are both relatively new curriculum developments. Faculty development opportunities are needed because either the oral health content is new to faculty outside the dental profession and/or dental and other faculty have not previously taught learners outside of their disciplines as part of IPE. For clinicians already in practice, continuing education (CE) opportunities are needed to gain new knowledge and skills and be able to apply them to patient care.

New knowledge and CE can be obtained in many formats with or without acquiring formal CE credit. However, health professionals generally have continuing education requirements for re-certification or licensure renewal. Accrediting organizations set standards for CE providers. For example, the American Dental Association (ADA) Commission for Continuing Education Provider Recognition (CCERP) has an application and review process using a set of standards and procedures. As part of the criteria, courses must have a sound scientific basis, written educational objectives and evaluation mechanisms. Methods may be live courses (conferences, workshops, seminars, teleconferences), self-instructional, and/or electronically mediated [http://www.ada.org/~media/CCEPR/files/cerp\\_standards.pdf?la=en](http://www.ada.org/~media/CCEPR/files/cerp_standards.pdf?la=en) (accessed 7/30/17). Journal-based CE is also available. Some types of physicians have “performance improvement” continuing medical education (CME) requirements and many board-certified specialists certified after 1990 must meet Maintenance of Certification (MOC) requirements. Part of the MOC requires Quality Improvement (QI) projects “to demonstrate competence in *systematic measurement and improvement* in patient care.” (<https://www.abp.org/content/improving-professional-practice-part-4>)

Overall, the search for dental and medical continuing education programs, especially live formats that focused specifically on integration of oral health and primary care yielded few relevant results when sought through individual professional dental organizations and websites. We found more resources through organizations that have developed to promote oral health, some primary care professional organizations, interprofessional organizations and government websites. Information from dental and other types of organizations will be presented separately. We focused on enduring educational resources rather than one-time events unless they were archived and subsequently available in another format.

We sought information from published literature that involved oral health training of non-dental clinicians and staff. To guide our search for unpublished, relevant CE, information and advice was first sought from administrators of different types of organizations that provide dental CE. We viewed 55 health profession and interprofessional organizations' websites. The websites were grouped into dental/oral health, primary care and government categories and assessed for evidence of any type oral health-primary care integration using our M-RMIC conceptual model. These websites were examined as well to see if there was a description of an oral health initiative, a dedicated oral health webpage, or considerable oral health information on their website, links to oral health resources, or little to no oral health information. For some organizations, information may be available but not accessible to non-members, which limits access to other types of healthcare providers.

#### Published Oral Health Educational Programs for Practitioners and Staff

We found five publications in this category. Some training programs for practitioners were conducted by state, county or local health departments as part of public health initiatives, thus merging education and practice integration for clinicians, staff and students. The Smart Smiles regional demonstration program, and subsequent statewide expansion throughout North Carolina as the Into the Mouths of Babies (IMB) program, began as partnerships of several non-profit, local, state and federal agencies. The NC Division of Medical Assistance that administers the Medicaid Program required physicians and other medical personnel to complete an AMA-approved CME course to be eligible for reimbursement for providing pediatric preventive oral health services. A dental hygienist provided the training. Between the program start in 2001 through the end of 2002, 1,595 medical professionals were trained (Rozier et al., 2003). This program is described as one of the case studies in Section 5.

The OPENWIDE program in Connecticut was focused on training non-dental health professionals (physicians, medical students and residents, nutritionists) and human service workers in Early Head Start and Head Start programs. This multi-media, modular curriculum focused on early childhood oral health, and could be adapted in content and format for childcare providers or OB/GYN residents. Goals included having non-dental providers address risk factors for oral disease, provide anticipatory guidance and prevention, and make referrals for dental care. More than 2,000 people were trained in the program's first year. Changes in knowledge and satisfaction from pre- to post-training were very positive, but changes in practice were disappointing. Multiple barriers were discussed including lack of funding as well as staff' and parents' lack of availability and interest. In the future, more input from parents in developing program content and delivery was recommended as well as training providers in improving communication with parents (Wolfe and Huebner, 2004). These lessons learned were important

ones, usually not discussed in the development of other health professional educational programs.

In Seattle and King County, the public health department in conjunction with the King County Health Action Plan, a public-private coalition, developed goals to improve overall health services for young children in the Kids Get Care program. In 2002, the program was expanded to include oral health activities because of data showing poor access to dental care and high untreated caries rates (Wysen et al., 2004). To gain physician support, “oral health champions” were identified in each professional medical group. Of note, “In 2002, the Washington Academy of Family Physicians and the Washington State Medical Association adopted resolutions urging physicians to address the oral health of mothers and their young children” (Riter, et al., 2008). Oral health training for medical practitioners and staff was included to provide preventive services to children from low-income families. An unusual feature of this public health program was a “services first” practice for children prior to Medicaid enrollment. Children were attached to medical and dental homes first for primary care and then a case manager would help the family get Medicaid coverage. Community health centers with co-located dental clinics were selected for program implementation. Dentists trained 184 primary care physicians and medical staff to screen children for oral health problems, apply fluoride varnish and refer them for dental care. Hygienists helped to support the medical staff to reinforce new oral health skills and integrate these activities into the well-child visits during the first few days. A public health nurse trained 355 staff in many community organizations about the importance of preventive dental services, how to identify possible caries, discuss concerns with parents and make referrals to the Kids Get Care case manager. Physicians trained dentists and staff to ask patients if they had a regular medical doctor, recent well-child visit, and immunizations, and make referrals as needed. These sessions provided opportunities for the dentists and physicians to engage in discussions about how poor oral health affects their patients’ wellness (Wysen et al., 2004). The Washington Dental Service Foundation (WDSF) helped fund the initiation of this program and two others in the state. The WDSF also developed a multi-media campaign called “children’s oral health matters” to build public awareness and led to broader healthcare coverage including Medicaid reimbursement for trained primary care providers for oral screening, oral health education and fluoride varnish application. This overall program was successful in increasing the number of oral health services provided in medical clinics and well-child visits (Riter, et al., 2008). The overall program illustrates clinical, professional and organizational integration among providers. The medical society resolutions, “services first” policy change, initiation of Medicaid reimbursement to medical providers for oral health services, and WDSF funding are examples of system integration that were critical to successful outcomes.

Another example of non-dental providers (pediatricians, NPs, obstetricians), allied health workers and community-based staff receiving oral health training took place as part of the Infant Oral Care Program (IOCP) developed at the UCLA School of Dentistry in partnership with the

Venice Family Clinic's Simms/Mann Health and Wellness Center and nearby WIC and Early Head Start/Head Start sites. Pediatric dentistry residents and IOCP faculty provided oral health training. The IOCP emphasized family-oriented, culturally sensitive approaches to recruit parents of young children, increase their understanding of the importance of oral health, and promote age-one dental visits in addition to other healthy behaviors (Ramos-Gomez, 2014). (See Section 3 for more information about the IOCP.)

Harper and colleagues described the National Dental Association (NDA) and the Aetna Foundation partnership to address oral health disparities by educating non-dental professionals about oral health and promote interactions between medicine and dentistry. Local NDA chapters hosted continuing education programs geared toward dentists and physicians. Partnerships formed with local chapters of the National Medical Association and the Association of Black Cardiologists. Interprofessional programs have been conducted in 12 states and the District of Columbia. They initially focused on the oral-systemic links and improving collaborations across disciplines. More recently, they have focused on topics such as Ebola, and Opiate Addiction. The NDA-Aetna partnership also led to a four-day program for nursing students during the 2015 Greater New York Dental Meeting where they received didactic and hands-on training for oral screening, an introduction to mobile dentistry and an introduction to the Greater New York Smiles children's program. After the training, the nursing students surveyed said they were more likely to perform oral screenings. The program has evolved into NDA-HEALTH NOW in seven underserved communities that involves interprofessional, community-based collaboration (Harper et al., 2017). This program includes dental, health and vision mobile clinics to "increase health care access, reduce disparities, increase health literacy and promote prevention in underserved and vulnerable populations, all through public-private partnerships." In 2016, the NDA hosted a seminar on inter-professional collaborative care for stakeholders in health, physicians, dentists, nurses, and pharmacists. Links to these presentations are on the NDA website including one about the NYU OHNEP program. These activities are examples of clinical, professional and organizational integration. <http://www.ndaonline.org/healthnow/> (accessed 7/14/17).

### Online Oral Health Education Resources for Health Professionals

Kim, Mouradian and colleagues (2004) conducted a review of online resources for training family physicians on oral health topics. They developed criteria for evaluating 56 websites available in 2004. They evaluated 18 target topic areas and 5 categories of web-design features. The majority of sites covered content areas in anticipatory guidance, caries and the role of fluorides, however, only 18% included an oral screening exam, 7% cultural issues and 5% the dental /medical interface (Kim et al., 2004).

*Smiles for Life.*

The Smiles for Life national oral health curriculum (SFL) is a well-documented online resource. The Society for Teachers of Family Medicine (STFM) was instrumental in developing the SFL. Now in its third edition, there are eight 45-minute online modules that include the relationship of oral and systemic health, child, adult, and geriatric oral health, pregnancy and women's oral health, caries risk assessment, fluoride varnish and counseling, acute dental problems, and the oral exam. There were 198,662 courses completed for CE credit at no charge as of July 2017. The courses have been approved for continuing education credit for physicians, nurses, PAs, pediatricians, midwives, dentists and medical assistants. Materials are also available to help educators teach the material in academic settings, including presenter notes, videos and educational objectives. A wide variety of resources are available, from clinical guidelines to interactive games. (<http://www.smilesforlifeoralhealth.org>)

Clark and colleagues (2017) conducted a survey of users of the SFL curriculum to determine if this educational resource has influenced clinical practice. As of March 2016, the site had 52,000 registered curriculum users and 127,000 courses completed for continuing education credit. There have been over half a million unique site viewers between 2010 and the first quarter of 2016. The authors claim that it is the most “widely utilized oral health curriculum for health professionals” is likely to be correct.

Among users who completed at least one module in 2013 or 2014, 87% were identified as a direct care provider (DCP) and 13% as educators of health profession students or residents. The authors reported,

*“Across professions, 85 percent of the 563 DCPs reported that SFL influenced their practice in each of the following oral health activities: conducting annual oral examinations, providing children and families oral health anticipatory guidance, conducting caries risk assessments, applying fluoride varnish when indicated, conducting oral cancer screening examinations, and referring patients for dental care.”*

Indeed, a major finding was that 47% of DCPs reported starting fluoride varnish applications after viewing the SFL curriculum. Some types of health professionals that use SFL are unlikely to apply fluoride varnish because of their patient population, but may be among the 73% who reported conducting oral cancer screenings either more regularly or better after using SFL.

Among educators, the favorable findings were that SFL:

*“a) helped me emphasize the importance of oral health (89 percent); b) improved my ability to teach oral health content (84 percent); c) made me more motivated to teach oral health (83 percent); and (d) reduced barriers to teaching oral health (79 percent)”* (Clark et al., 2017).

It is not known if there is a difference in results from those who voluntarily view the SFL modules, who may be more motivated to learn and apply new skills, compared to those who do so as part of a required course.

The National Interprofessional Initiative on Oral Health (NIIOH) website includes quarterly SFL statistics. The most recent report posted is for the second quarter of 2016. In this quarter, and since 2010, there were 57,891 and 599,231 discrete site visits respectively, with an increasing trajectory. In Q2 2016, 10,806 courses were complete for CE credit. Of eight courses, the fluoride varnish course was the most frequently completed, by 19%. Registered CE users were students (61%), and direct patient care providers (21%). Only 5% identified as intern/resident/fellow. Professions reported by the student users were from nursing, 40%, physician assistant 35%, physician, 11%, dentistry 10%. Among professionals, nursing (40%) and physicians (34%) were the most frequent groups of users (Smiles for Life National Oral Health Curriculum Report on Trends, User Profile, and Satisfaction. April 1, 2016 – June 30, 2016. [http://www.niioh.org/sites/default/files/smiles\\_for\\_life\\_utilization\\_report\\_q2\\_2016.pdf](http://www.niioh.org/sites/default/files/smiles_for_life_utilization_report_q2_2016.pdf) (accessed 6/21/17).

*Dental Continuing Education (CE) Accrediting Organizations and CE Providers.*

To obtain information about Continuing Education (CE) and Continuing Medical Education (CME) Programs, websites were viewed and key staff from a few organizations were contacted for information and suggestions for searching for CE courses about integration of oral health into primary care.

- American Dental Association (ADA), Commission for Continuing Education Provider Recognition (CERP). The American Dental Association is the largest dental organization in the U.S. with more than 161,000 members. Ms. Mary A. Borysewicz, the director of the Commission for Continuing Education Provider Recognition (CERP) Program of the ADA, provided information from the current and archived (from 2010) CERP provider course listings for all courses entered in the “Oral Health Communication and Literacy” category. Course listings are offered as a service to CERP recognized providers to advertise upcoming courses. At this time, ADA CERP providers are not required by the Commission to report all courses offered.

Almost all of the courses listed were self-study, web-based, or lecture. Only three courses were listed as both lecture and participation. Only one course had an integration or interprofessional component that could be identified from the course title: “The Tufts Headache and Face Pain Symposium: Diagnosis, Treatment and Interprofessional Options.” The course was taught by both medical and dental experts. The ADA Education and Careers website lists courses available for purchase any time in five categories: clinical dentistry, practice management, implantology, restorative dentistry and Leadership Institute. Based on the course titles, none of



these 68 courses involved collaboration with primary care providers. Other courses required membership log-in to access, a barrier for non-dentist primary care providers. (<http://www.ada.org/en/education-careers>)

The ADA ‘mouthhealthy’ website has some content directed at consumers but not specifically for other health professions. However, the symptom checker site could assist non-dental professionals with asking questions about patient’s symptoms and determining appropriate dental referral for their patients with dental problems. (<http://www.mouthhealthy.org/en>)

At the ADA’s Commission for Continuing Education Provider Recognition (CCEPR) website, 1,457 courses are listed for the time period 1/1/16-1/1/19. The categories “Dentist health and wellness” and “Practice management and risk management” were viewed. There was one course about the oral-systemic connection, but none were apparent that pertain to integration with primary care. The search function permits selection of the type of audience for a course. All of them were either an individual type of oral health professional or combinations such as dentist and dental hygienist. None of the options included non-dental health professionals. (<http://www.ada.org/en/ccepr/find-ce-courses#sort=relevancy>)

As part of the ADA’s Action for Dental health initiative, the ADA website has a list of ‘interprofessional education and collaboration best practices’ with links to IPEC core competencies, Smiles for Life online curriculum, which the ADA officially endorsed in 2012, and other information. The ADA News has also included articles about interprofessional education. ([www.ada.org](http://www.ada.org))

- Academy of General Dentistry (AGD). The AGD is a 35,000-member organization of general dentists. Ms. Lynda Lipske, Manager, Program Approval for Continuing Education (PACE) for the AGD suggested the following websites to search for relevant CE courses, in addition to the ADA website, already mentioned, that include large directories of CE courses.
  - Academy of General Dentistry CE Directory - Membership is needed to fully search this website. One of the courses offered in the online learning center is “Dental to Medical Cross Coding: Understand medical codes.” This course might benefit integration in the direction of providing medical services in dental practice. None of the accessible courses involving collaboration or communication with other health professions.
  - SimplyCE.com - a directory of continuing education courses for dental professionals and CE providers. A course under “practice management” was “Strategies for successful team management” and includes discussion of motivational and communication strategies.
  - Dentalex.com - lists very dental procedure oriented courses.

- CEsearchEngine.com – lists courses for many different professions in addition to health professions. There are four pages of courses listed for “dentist” but none pertain to integration topics. There are 25 pages of courses listed for “physician,” 22 for NP, 19 for PA, for 18 pages for nurses and 11 for pharmacy. A few courses pertain to IPE or provide continuing education credit for multiple professions, though dental CE is not included. For example:
  - Interprofessional Education/Practice: Preparing Ourselves and Our Students to be “Team-Ready” (ACPE – pharmacy)
  - Introduction to the Triple Aim for Populations (for CNE - nursing, CPE- pharmacy, CME- physician)
  - Achieving Breakthrough Quality, Access, and Affordability (for CNE, CPE, CME)
  - Teamwork and Communication in a Culture of Safety (CNE, CPE, CME)
- CEDirectory.ca – this website features a 112-page winter 2017 brochure with AGD courses for the Canadian region. A scan of the course offerings featured some pertaining to medical history considerations, medically compromised patients and medical emergencies, but not communication or collaboration with primary care providers.

Ms. Lipske was able to provide a merged list of organizations that have ACCME accreditation to provide CME and the list of providers approved for dental CE by ADA CERP or AGD PACE. Many universities provide both, but the provider name is different because they reflect different educational or healthcare components. ([www.agd.org](http://www.agd.org))

- Wake Forest School of Medicine, Northwest Area Health Education Center (AHEC) & Office of Continuing Medical Education. Ms. Sheila Bogan, Coordinator for dental and pharmacy continuing professional development, Wake Forest School of Medicine, Northwest Area Health Education Center (AHEC) & Office of Continuing Medical Education was contacted as an example of an AHEC provider that offers courses for many different health professions, including a category of courses called “interdisciplinary” that are open to all healthcare professions. They are unusual in that they offer credit through the Wake Forest University School of Medicine for different types of health professions and is an ADA CERP provider. Some recent 2017 courses were open to multiple types of health professionals including dental professionals. However, it appears that none were directed towards integration of oral health into primary care.

March: OSHA and HIPAA Update for Medical and Dental Professionals: Dental, Nursing and Allied Health Professionals

- March: Introduction to Dental Sleep Medicine: The Role of the Dentist in the Management of Snoring and Obstructive Sleep Apnea: Dental and Medical Professionals
- April: Oral Health Literacy for Older Adults: Dental and Health Education professionals.
- June: Dental Pain Pharmacotherapy: Considerations in Today's Healthcare Landscape: Dental and Pharmacy Professionals  
(<http://northwestahec.wfubmc.edu/mura/www/#/>)

*Continuing Medical Education Accrediting Organizations.*

- Accreditation Council for Continuing Medical Education (ACCME). This nonprofit corporation accredits institutions that offer CME to physicians and other healthcare professionals. Their 2015 annual report provides insights into the increasing trend for CME to be provided using enduring materials. The report includes information about the amount and format of CME that is delivered to physicians and “other learner” (non-physician). The specific type of non-physicians is not defined, other than they include participants other than MDs, DOs, and residents (who were in this category until 2015). They define enduring material as “an activity that is printed or recorded and does not have a specific time or location designated for participation. Rather, the participant determines where and when to complete the activity.” The type of physician activity with the greatest increase was “internet enduring material,” accounting for 34%, the same percentage as “regularly scheduled series,” a course that has a series of periodic, ongoing sessions. For the other learners, internet enduring material accounted for 58% of interactions <http://www.accme.org/physicians-and-health-care-professionals> (accessed 7/9/17). From this information, whether any of these educational activities includes oral health cannot be determined, but it does reflect the change in how CME is being delivered. Enduring material is more likely than live formats to be viewed independently, considered asynchronous, and not involve interaction and discussion within or across disciplines.
- Joint Accreditation for Interprofessional Continuing Education. Ms. Anna L. Treudt, Coordinator for Joint Accreditation for Interprofessional Continuing Education was contacted for information. To support team-based continuing education, the ACCME, the Accreditation Council for Pharmacy Education, and the American Nurses Credentialing Center Accreditation Program began a joint accreditation process for CE for healthcare teams. Some providers conduct CE for the healthcare team including dentists as well as other health professions, but other than medicine, pharmacy and nursing professionals, others would not obtain CE credit. The ADA has been involved in collaborative meetings with Joint Accreditation, but to date, has not joined.

## Review of Health Profession Associations' Websites for Oral Health Content

Dental/Oral Health, Primary Care, and Interprofessional Health Association websites were reviewed for oral health content and educational activities, and if applicable, the type of integration represented based on the six types in our conceptual model shown in Table 4-3.

### *Dental/Oral Health Profession Associations.*

- American Dental Association and Academy of General Dentistry, information presented earlier in this section.
- American Dental Education Association (ADEA). ADEA has been a leader in the advancement of IPE and IPCP and is a founding member of the IPEC. ADEA's 2011 annual session was titled, "Interprofessional education: Teaching and learning together for better health" and annual sessions since then have included many symposia pertaining to IPE. Dr. Valachovic, President and CEO of ADEA and President, Interprofessional Education Collaborative was a featured speaker at the 2016 National Center Summit on the Future of IPE. There have been sessions about IPE and medical–dental integration at the annual meetings such as those in 2017:
  - “Oral Health: An Essential Component of Whole Person Care in the Primary Care Medical Home”
  - “Collaborative Boundaries in Dental Education and Practice: The Nurse Practitioner—Dentist Model for Primary Care”

The leadership of the ADEA Section on Continuing Education was contacted, and they placed an item for us on their listserv describing our environmental scan and requesting information about CE courses that pertain to the integration of oral health in primary care, with a due date for responding. A follow-up e-mail was posted with a reminder. Unfortunately, we did not receive any responses. (<http://www.adea.org/>)

- Hispanic Dental Association (HDA). The HDA has hosted joint 2016 national conference on Advancing Hispanic Health with the National Hispanic Medical Association. This could be an example of organizational integration. Other aspects of integration cannot be determined from the website. (<http://hdassoc.org/news-and-videos/newsletters/>) (<http://hdassoc.org/>)
- National Dental Association (NDA). The NDA hosts interprofessional training activities, conferences and workshops for nursing students to learn about oral health. Information is described on their website and in a publication by Harper and colleagues, described earlier. (Harper et al., 2017) (<http://www.ndaonline.org/>)

- American Dental Hygienists' Association (ADHA). ADHA offers CE in various formats. Many activities could not be directly accessed, so it could not be determined if any program involves aspects of interprofessional collaborative practice. On their website is also a link to a white paper, "Transforming Dental Hygiene Education and the Profession for the 21st Century." (ADHA, 2015) Among many topics is the need for dental hygiene education to prepare practitioners to work with diverse populations and improve access to care. (<https://www.adha.org/>) (See dental hygiene education in this scan for more details.)
- Medicaid, Medicare, CHIP Services Dental Association (MSDA). This website has professional development materials about oral health for administrators and policy makers that could also be applicable for other non-dental health professionals. There are links to articles about integration of oral health and primary care. (<http://www.medicaidental.org/>)
- National Interprofessional Initiative on Oral Health (NIIOH). This organization is a consortium of funders and health professionals with the mission to engage primary care clinicians to eradicate dental disease. NIIOH has a focus on "education and training systems that support primary care clinicians." There are many resources on their website, including videos and links to online courses including the SFL national oral health curriculum and SFL metrics, mentioned earlier. (<http://niioh.org/>)
- National Maternal and Child Oral Health Resource Center (OHRC). This Center is based at Georgetown University and compiles many educational and training materials to promote strategies to improve oral health for pregnant women, infants, children, adolescents, including those with special health care needs, and their families. It provides resources for Title V MCH Block Grant needs assessment, and reporting of outcome and performance measures. (<https://www.mchoralhealth.org/>)
- National Network of Oral Health Access (NNOHA). The members of this organization are safety-net oral health providers. Among the organization's values listed on their website are: "Oral health is integrated with primary care" and "Every Health Center has an oral health program." The website lists several initiatives such as the "Interprofessional Core Clinical Competency Pilot Project" described as "working to measure the impact on oral health services when the medical team received training in oral health core competencies." The pilot project included physicians, NPs and PAs. The result of this project, "A user's guide for implementation of interprofessional oral health core clinical competencies: Results of a pilot project, 2015" includes sections on online and in-person training. A set of interprofessional oral health core clinical competencies within five domains are described: risk assessment, oral evaluation, preventive interventions, communication and education, and interprofessional collaborative

practice. ([http://www.nnoha.org/nnoha-content/uploads/2015/01/IPOHCCC-Users-Guide-Final\\_01-23-2015.pdf](http://www.nnoha.org/nnoha-content/uploads/2015/01/IPOHCCC-Users-Guide-Final_01-23-2015.pdf))

- National Oral Health Innovation and Integration Network (NOHIIN). The “National Oral Health Innovation and Integration Network (NOHIIN)” is a network of safety net and primary care associations to be “champions of oral health as part of overall health.” DentaQuest Institute’s Safety Net Solutions is a national partner in this endeavor as well as the Massachusetts League of Community Health Centers. There are many resources on this website. (<http://www.nnoha.org/>)

#### Associations Belonging to the Interprofessional Education Collaborative (IPEC)

Table 4-4 has a list of the six original founding professional education association members of IPEC and the 9 members added in 2016. These associations’ websites were reviewed to see if they contained the following types of information about oral health: a webpage devoted to oral health, information about CE courses or webinars with oral health content, website lacked original oral health content but had links to resources on other websites, or the website had minimal or no oral health information. Because the American Dental Education Association (ADEA) is devoted to oral health, it was not included in the summary statistics.

#### *Founding IPEC Members in 2009.*

- American Association of Colleges of Nursing (AACN). The AACN, under curriculum standards, lists oral health with links to resources such as the Qualis Health guide, “Oral Health: An Essential Component of Primary Care” and New York University College of Nursing’s Oral Health Nursing Education and Practice (OHNEP) toolkit for primary care NP and midwifery programs. (<http://www.aacn.nche.edu/>)
- American Association of Colleges of Osteopathic Medicine (AACOM). The website has a search function. Searching for oral health or dental/dentistry leads to a variety of materials, not all pertain to education. There is a link to MedEdPORTAL and to presentations conducted at A. T. Still University Arizona School of Dentistry and Oral Health, Qualis Health White Paper, and SFL. (<https://www.aacom.org/>)
- American Association of Colleges of Pharmacy (AACP). A course syllabus on cosmetics includes two sessions on mouth and oral care problems & products. Learning objectives about oral health topics include general concerns about the mouth and oral cavity, anatomy, causes and treatment for calculus, caries, periodontal diseases, dentinal hypersensitivity, dental stains, malodor, dry mouth and aphthous ulcers. (<http://www.aacp.org/governance/SECTIONS/pharmaceutics/Documents/Special%20Projects%2>)

0and%20Information/Pharmaceutics%20Curriculum%20at%20Volunteer%20Schools/Kuwait%20University%20-%20521%20CosmeticsP.pdf)

- American Dental Education Association (ADEA) (listed under dental associations).
- Association of American Medical Colleges (AAMC). The AAMC website does not have a specific section or links for oral health, though a search function is available. Searching for dentistry or oral health lists many items not directly related to education such as loans and funding opportunities. However, AAMC hosts the MedEdPORTAL site which includes peer-reviewed teaching resources for oral health. One key set of items is part of the Oral Health in Medicine Model Curriculum. The AAMC received funding from HRSA in 2010 to develop and disseminate materials for medical school curriculum to build capacity in oral health. As of June 2017, the collection of curriculum materials had 39 items that addressed different topics and utilized different instructional methods. Almost all of the topics pertain to patient care. The primary intended audiences are professional school training (n=38) and professional school post-graduate training (n=16). “The Building Oral Health Collection (BOHC) aims to advance physician understanding of the oral-systemic impact on overall health and support preparing clinicians to provide comprehensive coordinated care. The collection is based on eight key topic areas and requisite content for comprehension that form an oral health curriculum for undergraduate medical education.” (<https://www.mededportal.org/collections/#faq-305296>) (<https://www.mededportal.org/collections>)
- Association of Schools and Programs of Public Health (ASPPH). The ASPPH website has a search function. It leads to announcements about student, faculty and alumni research achievements who are dental professionals. (<http://www.aspph.org/>)

*Additional IPEC Association Members that Joined in 2016.*

No or minimal oral health information was found on these association websites:

- American Council of Academic Physical Therapy (ACAPT), (<http://www.acapt.org/>)
- American Occupational Therapy Association (AOTA), (<https://www.aota.org/>)
- American Psychological Association (APA) There was some information about dental phobias. (<https://www.apa.org/>)
- Association of Schools and Colleges of Optometry (ASCO), (<https://optometriceducation.org/>)
- Association of Schools of Allied Health Professions (ASAHP), (<http://www.asahp.org/>)
- Council on Social Work Education (CSWE)  
This website has many links to information about integrated healthcare and IPE, but not specifically to oral health. (<https://cswe.org/>)
- Physician Assistant Education Association (PAEA)

There is no information about oral health on the website but it is one of the four PA organizations that has an oral health initiative. See AAPA above. (<http://paeonline.org/>)

Some oral health information was found on these websites but with little relevance to integration:

- American Association of Colleges of Podiatric Medicine (AACPM). A curricular guide for podiatric medical education is on their website. It includes head and neck anatomy. The learning objectives focus on the tongue, neurovasculature, salivary glands and pharynx, but not oral diseases. (<http://www.aacpm.org/wp-content/uploads/2016AACPMCurricularGuide.pdf>) (<http://www.aacpm.org/>)
- Association of American Veterinary Medical Colleges (AAVMC). This profession includes caring for the oral health of animals. The search function on this website led to articles about IPE and television show about Vet school that included episodes showing a 4th year student performing dental surgery for a cat, and how a first year student learns how to “handle a horse for a basic mouth exam.” (<http://www.aavmc.org/>)

Of these IPEC association members, the AAMC was the only one with dedicated oral health sections as part of the MedEdPORTAL. (See AAMC below.) None offered relevant CE/CME. The AACCP had some oral health learning objectives embedded in a curriculum about cosmetics. Four associations had links to resources on other sites, and nine had minimal or no oral health information on their website.

#### Primary Care Professional Organizations with Oral Health Initiatives and/or Oral Health Member Interest Groups

- American Academy of Family Physicians (AAFP). The AAFP has an Oral Health Member Interest Group. The group’s goals include “provide AAFP members with oral health resources (e.g. SFL, American Academy of Pediatrics oral health stat champions, etc.) that can be used with patients at point of care.” AAFP has a CME website, but information on oral health was not found among the courses listed. However, a search function links to many resources. The AAFP’s website does include dental caries Clinical Preventive Service Recommendations based on the U.S. Preventive Services Task Force and a link to the American Academy of Pediatrics Campaign for Dental Health website. (<http://www.aafp.org/membership/involve/mig/oral-health.html>)
- American Academy of Physician Assistants (AAPA), Oral Health Initiative and National Commission on Certification of Physician Assistants (nccPA) Health Foundation. The Physician Assistant profession held its first PA Leadership Summit on Oral Health in 2010. Four organizations came together to address the need for dental care in underserved populations.



These organizations were AAPA, Accreditation Review Commission on Education for the Physician Assistant (ARC-PA), the National Commission on Certification of Physician Assistants (NCCPA) and Physician Assistant Education Association (PAEA). Summits have been held annually and the AAPA developed a special interest group in oral health and an oral health initiative. The Nursing profession followed the PA model and subsequently held its own summit on oral health (Nelson, M. 4 Orgs Working Together to Put Teeth into Oral Health Movement. January 27, 2016. <http://paeaonline.org/oral-health-movement/> (accessed 7/13/17). The AAPA Learning Central website lists two self-assessment activities available for CME credit: “Don’t Miss It: Common Oral Conditions Seen in Primary Care”, and “Cardiovascular Disease and Oral Health: What You Need to Know About Oral Hygiene and Heart Health.”

The National Commission on Certification of Physician Assistants (nccPA) Health Foundation lists many oral health resources on their website. The nccAAPA also provides grant funding to help equip PAs to improve oral health care. The funding opportunity announcements are:

- Community Outreach Grants: Apply for up to \$500 to design and implement a PA-led project that advances oral health awareness, prevention and treatment. Certified PAs, PA faculty at accredited PA programs or PA students working with PA faculty may apply.
- Research Integration Grant: Apply for up to \$3,000 to integrate oral health into your PA program curriculum or clinical practice and evaluate your strategies. PA faculty at accredited PA programs and clinically-practicing PAs may apply.  
<http://www.nccpahealthfoundation.net/Grant-Impact/Grant-Programs#Integration>(<https://www.aapa.org/learning-central/national-health-quality-initiatives/oral-health-initiative/> (accessed 7/8/17))

At the AAPA 2015 Conference, an oral health outreach activity was conducted with PAs, PA students, and faculty and dentists from the University of Pacific Dugoni School of Dentistry. The PAs led oral health education programs at a local preschool, and the children received oral health education from the PA students while the dentists conducted oral health screenings and fluoride varnish applications. (Rizzolo D. Oral Health Outreach at AAPA Conference 2015. June 19, 2015. <http://www.pasconnect.org/oral-health-outreach-at-aapa-conference-2015/> accessed 7/9/17). PAEA has used oral health as a key topic as part of its Interprofessional Leadership Program for students and faculty.

- American Academy of Pediatrics (AAP). The AAP has a Children’s Oral Health Initiative, an extensive oral health website and definite commitment to the integration of oral health in pediatric practice. The website states: “The American Academy of Pediatrics (AAP) works to improve children's oral health through communication and collaboration between the medical and dental homes, and to make pediatricians and other health professionals an essential

part of the oral health team.” There are resources available for oral health education and training including:

Protecting All Children’s Teeth curriculum (PACT): This online training for CME credit is not currently available, but PowerPoint presentations, photos, a post-test, for use by educators on a variety of oral health topics are available. An oral health risk assessment tool and self-management goals, training videos for conducting the risk assessment and fluoride varnish application and other resources are available. (<https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Oral-Health/Pages/Protecting-All-Childrens-Teeth.aspx>)

Bright Futures Oral Health Resources: Health promotion and disease prevention materials for infants, children, adolescents, families and communities that include periodicity schedules about what to do during well-child visits, and how to do it well. Establishing a dental home is listed as a priority for the 12-month visit. Fluoride varnish application is recommended at the 6-month (first tooth eruption) visit through 5 year visits (if the child does not have a dental home), and selective fluoride supplementation through 16 year visits if the primary water source is fluoride deficient. Many state’s Medicaid programs and EPSDT programs are aligned with Bright Futures (<https://brightfutures.aap.org/materials-and-tools/Pages/Presentations-and-Handouts.aspx>).

Education and Quality Improvement in Pediatric Practice (EQIPP): This link features the Oral Health in Primary Care course among several course options. The course includes the role of the primary healthcare provider in facilitating the establishment of a dental home, the dental caries process; caries risk assessment, injury prevention, fluoride varnish and other oral health topics. (<https://shop.aap.org/eqipp-oral-health/>)

- Gerontological Society of America (GSA). The GSA has an oral health initiative with many components: an oral health workgroup, a GSA oral health interest group, and a newsletter, “Oral Health: an Essential Element of Healthy Aging” for interprofessional audiences. The GSA convened an Oral Health Forum in March 2017 to create a roadmap to improve interprofessional oral health care of older adults. This oral health forum led to the July 2017 white paper, “Interprofessional Solutions for Improving Oral Health in Older Adults: Addressing Access Barriers, Creating Oral Health Champions.” (<https://www.geron.org/images/gsa/documents/gsa2017oralhealthwhitepaper.pdf>) The website also has links to many oral health related organizations and initiatives, publications, research opportunities and funding. (<https://www.geron.org/>)

- National Association of School Nurses (NASN). This organization has developed a partnership with the ADA to “promote awareness of oral health in schools.” There is an Oral Health Connections website, and oral health forum, a self-assessment quiz, teaching tools, resources, and an oral health videocast series, on their website to help them take a “leadership

role in oral health care in the school setting.” (<https://www.nasn.org/home>  
<http://www.oralhealthconnections.org/Home>)

- Society of Teachers of Family Medicine (STFM). This organization plays a key leadership role in the integration of oral health in primary care. It hosts the SFL curriculum that includes a wealth of oral health resources. (SFL discussed earlier.) (<http://www.stfm.org/>)

#### Other Primary Care Professional Organizations with Some Oral Health Content or Links to Resources

- American Association of Nurse Practitioners (AANP). Continuing education courses and educational tools and resources are listed by topic. Oral health is not one of the topics listed. There is a link to the OHNEP interprofessional oral health faculty toolkit with many resources. (<https://www.aanp.org/education/continuing-education-ce>) (<http://ohnep.org/faculty-toolkit>)
- American Board of Preventive Medicine (ABPM). Public Health and General Preventive Medicine is one of three specialties certified by this board. Information about this specialty includes an examination content outline. Oral health is listed as a topic. (<https://www.theabpm.org/>)
- American College of Nurse-Midwives (ACNM). The ACNM has an Oral Health page on their website with links to the New York University College of Nursing’s Oral Health Nursing Education and Practice (OHNEP) program and interprofessional oral health toolkit, and the Qualis Health guide, “Oral Health: An Essential Component of Primary Care.” (<http://www.midwife.org/Oral-Health>)
- American College of Preventive Medicine (ACPM). This website has a search function. There are a few links to interprofessional events that mention dentistry and documents that refer to prevention of dental caries such as the CDC Community Guide. (<http://www.acpm.org/>)
- American Congress of Obstetricians and Gynecologists (ACOG). The ACOG website has a search function that links to a committee opinion about oral health care during pregnancy and throughout the lifespan. It includes a table about common oral health conditions during pregnancy and sample oral health questions to ask during a prenatal visit. They conclude that oral health during pregnancy is safe and should be recommended, and that obstetricians-gynecologists have opportunities to educate women about the importance of dental care and good oral hygiene throughout life. The website also has links to the national consensus statement about oral health during pregnancy and information about the safety of dental x-rays and teeth cleanings during pregnancy. (<https://www.acog.org/>)

- Association for Prevention Teaching and Research (APTR). The APTR has a set of 17 learning modules based around Healthy People 2020. Module 15 is titled, “Oral health across the lifespan.” The modules are available for CE credit for many health professions but not dentistry. ([http://www.aptrweb.org/?page=PH\\_LearningModulescommun](http://www.aptrweb.org/?page=PH_LearningModulescommun)) (<http://www.aptrweb.org/>)
- National Association of Community Health Centers (NACHC). This site has a “Roadmap” of key resources pertaining to oral health including some archived PowerPoint presentations and other resources. A webinar (not archived) was available in June 2017, titled “FQHC Oral Health Policy and Issue Updates” (<http://www.nachc.org/>)
- National Association of Pediatric Nurse Practitioners (NAPNAP). There is a CE course listed on the website titled, “Open Mouth, Open Mind: Expanding the Role of Primary Care Nurse Practitioners.” <https://www.napnap.org/> and a link to the OHNEP website and toolkit.
- Patient-Centered Primary Care Collaborative (PCPCC). This non-profit organization has an oral health integration page with links to key documents about oral health and primary care integration. <https://www.pcpcc.org/topic/oral-health-integration> (<https://www.pcpcc.org/>)

#### Primary Care and Health Profession Associations with Little or No Oral Health Information on Website

- American College of Clinical Pharmacy (ACCP). The search function did not lead to information about oral health or dental/dentistry. There are many practice and research networks, but none specifically pertaining to oral health. (<https://www.accp.com/>)
- American Interprofessional Health Collaborative (AIHC). This organization hosts conferences and webinars to promote interprofessional education. Enduring materials are not on the website. (<https://aihc-us.org/>)
- American Medical Association (AMA). The AMA website has an education center to search for CME courses. Of the 20 live activities and 111 listed under enduring material, one was titled, “Implementing team-based care.” Course materials included implementation resources and documents, but oral health professionals were not listed as part of the team. There were courses listed for behavioral health integration within primary care but not oral health integration. Searching journal-based CME activity, there were courses pertaining to two oral health topics - oral human papillomavirus infection and oral cancer. (<https://www.ama-assn.org/education/continuing-medical-education>) (accessed 7/9/17).

- American Nurses Association (ANA). No oral health information found. (<http://nursingworld.org/>)
- American Osteopathic Association (AOA). The AOA Continuing Medical Education website lists some online courses and webinars, but none pertained to oral health. (<http://www.osteopathic.org/inside-aoa/development/continuing-medical-education/Pages/default.aspx>)
- American Pharmacists Association (APhA). The APhA continuing education website has an education library with courses that are free or can be purchase. There were no search categories that pertained to oral or dental health, primary care or integration with other types of health professionals. (<http://www.pharmacist.com/education>)
- American Public Health Association (APHA). The American Public Health Association’s Center for Professional Development has an online continuing education program. Types of credits offered include CHES (certified health education specialist), CME (medical), CNE (nursing), CPH (certified in public health), and “OP – other professional, with the note to check with your licensing or certification board to see if they accept CME for non-physician credits.” CE for continuing dental education is not listed although APHA has an active and long-standing oral health section. (<https://www.apha.org/professional-development/continuing-education/online-continuing-education-program>)
- American Society of Health-System Pharmacists (ASHP). There is a search function, but little relevant information pertaining to integration appears. There is an article about bisphosphonates linked to osteonecrosis of the jaw. (<https://www.ashp.org/>)
- National Center for Interprofessional Practice and Education (NCIPPE). This Center, based at the University of Minnesota, focuses on advancing IPE and IPCP. The website has a search function that links to “1,652 IPE resources” and other educational offerings. Some articles about dentistry appear, primarily with regard to IPE assessment tools. There is no specific focus on oral health. (<https://nexusipe.org/>)
- Society for General Internal Medicine (SGIM). This organization for primary care internal medical faculty has 70 interest groups, but not one specific to oral health. The website has a search function that links to a variety of items where oral health is mentioned ranging from clinical manifestations of oral ulcers on the tongue to dental organizations that have signed onto join advocacy letters. (<http://www.sgim.org/home>)

## Examples of Government Websites with Oral Health Resources for Healthcare Professionals

- Administration for Community Living, Administration on Aging. This agency has an oral health website with a searchable database of community-based oral health programs and the Community Guide to Adult Oral Health. (<https://oralhealth.acl.gov/>)
- Agency for Healthcare Research and Quality (AHRQ). This agency has a page of oral health resources and reports. (<https://www.ahrq.gov/research/findings/final-reports/oral-health/index.html>)
- Health Resources and Services Administration (HRSA). This agency has extensive information on its website and is the leading government agency designated to improve access to healthcare. HRSA has developed the Integrating Oral Health and Primary Care Practice Initiative. The website lists many agency-wide efforts to promote oral health. (<https://www.hrsa.gov/oralhealth/>)

Examples of many oral health resources provided include:

- HRSA Reports – “Integration of oral health and primary care practice” includes recommendations for health care professionals. (<https://www.hrsa.gov/publichealth/clinical/oralhealth/primarycare/integrationoforalealth.pdf>)
  - Archived webinars: HRSA Health Workforce DMD Webinar Series: Integrating oral health and primary care training. April 12, 2016. (Speakers: Joskow, Silk, Brand, Haber) (<https://hrsa.connectsolutions.com/p3ijr2og9zy/?launcher=false&fcsContent=true&pbMode=normal>)
  - Funding: NNOHA and the NMCHOHRC are two of the many organizations that receive funding from HRSA.
- 
- National Institute for Dental and Craniofacial Research (NIDCR). As part of our environmental scan, the NIDCR Office of Communications and Health Education was contacted to see if NIDCR had hosted or was aware of any relevant CE programs. Ms. Victoria Contie suggested contacting several investigators who had conducted research involving primary care practices and medical-dental collaboration, and this was done. However, if we could not determine if the interventions tested were continued after the research ended, they were not included in our review. The NIDCR website lists several funding opportunities for multidisciplinary research in areas such as HIV/AIDS, aging, and behavioral and social science research. One of NIDCR’s 2030 goals is that “Oral health will be fully integrated into the study of overall health...” (<https://nidcr2030.ideascale.com>)

- Substance Abuse and Mental Health Services Administration: SAMHSA-HRSA Center for Integrated Health Solutions. A section of this website is devoted to “Addressing Oral Health.” It includes tips to incorporate oral care in integrated care settings. This agency hosted an excellent webinar in 2016 about integration of oral health and behavioral health “Before You Say Ahhh... Integrating Oral Health and Behavioral Health in Primary Care Settings.” The presentation is archived on the website. (<https://integrationedge.readz.com/oral-health-overview>)

### Summary of Website Review

The 55 health profession association and government websites reviewed by type of oral health integration evident are summarized in Table 4-5. Some organizations are listed in more than one category.

The most frequent type of integration demonstrated by reviewing association websites is functional, applicable to 42% of the organizations. Many organizations provide links to relevant oral health educational resources. A fifth of the organizations have oral health initiatives, an oral health member interest group, a dedicated oral health webpage or specified activities that pertain to integration and are shown in the normative category. Organizations that provide funding for interprofessional oral health activities are listed under system integration. Several organizations have evidence of clinical and/or professional integration on their websites and five provide examples of organizational integration. Of the 43 non-dental associations, 42% have minimal or no oral health information on their website, or it could not be determined. It is possible that they are engaged with oral health activities, but the website is not comprehensive or updated. For example, PAEA is part of the four organization PA group that has an oral health initiative described on the AAPA website, but it is not shown on the PAEA website.

### DISCUSSION

How should education and continuing education be provided to primary care clinicians and educators to promote integration of oral health? As indicated at the beginning of this section, the concepts of IPE, IPCP and oral health integration are intertwined. IPE can be considered a prerequisite to integration which is more closely related to ICPC, where members of different professions implement the communication strategies they learned, and work together in a knowledgeable and respectful manner to provide safe and high quality, team-based primary care. IPE can also be part of the process of how primary care providers learn about oral health. Based on this environmental scan, IPE activities are advancing more rapidly than integration of oral health into educational curricula. More definitive and current information about the extent to which educational programs are including oral health in their IPE activities is in progress based on surveys of many health professions recently conducted. (Silk, personal communication).

Several investigators have conducted reviews of research to assess the effectiveness of interprofessional educational experiences in changing practitioner behavior and patient health outcomes (Rafter et al., 2006; Reeves et al., 2013, Brandt et al., 2014). They concluded that the effects on these outcomes are largely unknown. Educational interventions for primary care providers that focus on oral health may increase knowledge, but we do not know to what extent the longer-term effects are on patients' or the public's oral health.

Continuing education programs are increasingly available through the internet, done online by individuals on their own. However, this may not be the appropriate format for encouraging collaboration and integration across professions. Face-to-face interactions between medical and dental professionals during and after training can be difficult to schedule and coordinate. Not all medical schools have a co-located dental school. Not all hospitals include a dental residency program. Practitioners in geographically remote, rural and underserved areas may have more difficulty getting access to "live" continuing education with colleagues of other disciplines. When primary care providers do not have access to face-to-face instruction about oral health, resources such as SFL are very useful. They are also useful for hybrid instruction where online resources are followed with in-person activities. For acquisition of more complex clinical skills, online learning alone is not as likely to be as effective. From either type of instruction, learners need opportunities for assessment and timely feedback.

To make changes at organizational and system levels, administrators and decision makers need to be educated about the importance of oral health in primary care. Academic deans and curriculum committees as well as individual course directors make decisions about course content at the clinical and professional levels. Unless offered by government and non-profit organizations, revenue generating continuing education courses are market-driven. If enrollment is low, the topic may not be repeated. Resources on the web have the advantage of being available on demand, available for distance learning, and economies of scale but incur upfront development costs that may not have a way of being recovered without an associated fee for use. Costs are greater for formats that include live or asynchronous communication with a faculty facilitator. Continuing education courses that are offered for credit toward licensure or certification are more likely to have an associated fee.

Reviews of internet-based or e-learning in the health professions have shown similar findings to reviews of IPE (Cook et al., 2008; Cook et al., 2010; Sinclair et al., 2015; Sinclair et al., 2016). E-learning formats are useful and convenient for health professionals to acquire knowledge and some types of clinical skills. High quality evidence is not available to assess the long-term effectiveness of e-learning on changes in practitioner behavior or the ultimate goal of improving health.



As shown in our case studies, oral health education and continuing education of non-dental professionals can lead to oral health integration into primary care and improve access to oral health services. The chain of events needs to be tracked and assessed to demonstrate improved patient oral health and health outcomes. This evidence would provide further rationale and motivation to advance the integration process.

### Limitations

There were several limitations to obtaining information about continuing education related to our topic. This material is difficult to find from published information that appears on PubMed. Many activities are relatively recent, have not included or reported an evaluation component, and have not been published in the peer-reviewed literature. During the period from January to July 2017 that this scan was conducted, we received frequent announcements about programs and events that may have been relevant, but the information was fleeting. Searches of websites and grey literature are incomplete in part because information is rapidly evolving. We limited our investigation to information most likely to be enduring. This limitation biases the type of information and formats we could assess. The websites of organizations were the most accessible sources of enduring information. Some organizations have more timely and comprehensive websites.

However, from literature, archived presentations and websites, it is difficult to assess the content and quality of educational materials and experiences, and the extent oral health knowledge and skills have been incorporated. Unless a live course or presentation was attended or was archived and viewed online, we could not be certain from the title if the content actually discussed integration of oral health and primary care. The authors (JW, KA) attended some webinars and presentations at national conferences with relevant sounding titles, but the content did not always address our integration subject. Reviewing all medical and dental school websites or accredited continuing medical education providers was not conducted. Some sites offering CE were not accessible because organizational or institutional membership or subscription to commercial sites were needed. Some professional organizations have CE opportunities available directly from their website. However, those that do not, may still offer CE at their national conferences. We found information about some presentations using google searches, but with a few exceptions, we did not scan programs of conferences seeking relevant presentations.

Most evaluations of continuing education and IPE programs are of short-term effects comparing knowledge or attitudes before and after the educational experience. A survey of SFL users that assessed some changes in clinical practice was an exception. This information was based on self-report. Surveys may indicate that there has been IPE, but the interactions may be of limited duration and exposure. The intended type of professional audience for continuing education programs may be identified but not the actual audience or the number of participants.

Having oral health information on an association website does not necessarily reflect that the professional group is making efforts towards integration, but at least it shows there has been thought given to the importance of oral health and an attempt to make information easily available. It is also possible that organizations with no oral health information on their website are engaging in oral health activities, but their website is either not comprehensive or not current.

This analysis was limited to primary care providers. As discussed by Silk, many medical specialties and other health and allied health professions address patients' oral diseases and conditions. (Silk, 2017b.) For example, oncologists interact with patients with oral cancer. Massage therapists may alleviate orofacial pain. Social workers and community health care workers play an important role with helping people navigate the healthcare and dental care delivery systems. Behavioral health professionals who see clients frequently may become aware of their dental concerns due to their pain and anxiety, or embarrassment about smiling and showing their teeth. Silk also emphasizes that other professions such as teachers, childcare workers and home health aides all need to be educated about the importance of oral health, as well as health departments and policy makers.

Assessing the role of health literacy within these educational and CE endeavors was not part of the charge. However, with the exception of some CE courses with health literacy in the title, there was very little mention of this topic. From reviewers websites and titles of presentations, it cannot be determined if HL was addressed as part of these IPE or integration activities.

### Future Developments

While this report was limited to the U.S., there is a need for prevention and management of oral diseases in the U.S. and globally. In 2011-13, to improve "global oral health," an expert panel developed oral health competencies for four groups that included dental and non-dental health professionals and other key stakeholder groups. These groups are: 1) dental students, residents and dentists, 2) community health workers, dental hygienists and dental therapists, 3) non-dental health professionals, and 4) non-health professionals such as parents, teachers, decision makers and consumer advocates. For non-dental health professionals, competencies included basic dental anatomy, conducting a dental history and screening, signs, symptoms and risk factors for oral disease and other health issues presenting in the orofacial region, manage dental emergencies, apply fluoride varnish, and oral hygiene information. They emphasized the need for a team-based workforce and the need to educate professionals and groups of the public in addition to the traditional dental team (Benzian et al., 2015).

There is a shortage of primary care physicians, and in both medicine and dentistry, access to care issues exist. Cassel and Wilkes (2017) describe the need for, and the many barriers that exist to

enlarge the primary care workforce. In the U.S., less than 25% of medical school graduates practice primary care. The authors propose an educational environment that is embedded in a health care delivery system where primary care providers and specialists work together in teams to coordinate care. To this end, Kaiser Permanente is planning a new medical school to prepare graduates for new models of health care delivery (Cassel et al., 2017). Oral health care needs to be part of this new educational and health care environment, as well as others that are evolving. Although some forms of integration of oral health and primary care have existed for a long time, there is a renewed and growing interest in this topic. Education and practice need to be reformed together so what is learned can be applied. This need is true for dentistry more so than other aspects of healthcare because dentistry has been siloed in both the education, practice and policy arenas.

### Summary

This environmental scan found that the importance of oral health has become recognized by some primary care organizations, in particular, pediatrics, family medicine, physician assistants and geriatrics. The AAP, AAPA, GSA, STFM are taking active steps to engage and educate members about oral health so they will incorporate oral health activities in practice. Many health professions and governmental organizations, particular HRSA, offer free access to webinars, PowerPoint presentations, videos, reports and other oral health materials that are archived and have the potential to be enduring educational material. The OHNEP program is a good example of resources to include oral health in the nursing curricula (Dolce, Haber and Shelley, 2012). Organizations that do not create their own materials often link to resources available on other organization websites. Yet, there are many opportunities for more healthcare professional organizations to inform and engage their members about oral health and develop collaborations with dental colleagues.

Live, in-person educational presentations outside of professional conferences are not well documented and difficult to find, especially after the activity has been conducted. Activities that encourage attendance by both dental and non-dental audiences are rare, and CE credit for dentists is not generally offered for courses that offer CME credit and vice versa. CE providers are recognized by accrediting organizations, not individual courses.

ADEA has been instrumental in the inclusion of oral health professions in IPE activities. Many schools are initiating new and creative IPE activities because of accreditation requirements. HRSA funding for predoctoral and postdoctoral training programs has encouraged collaborations and team-based care. Publications are primarily available from the more established programs. Participation in IPE may increase communication and interactions among dental and non-dental students, but does not necessarily mean that non-dental learners are learning about oral health content. The amount of oral health content and acquisition of oral health clinical skills such as

oral health screening and application of fluoride varnish was minimal based on surveys of predoctoral and postdoctoral health profession educational programs. More opportunities are needed for pre- and post-licensure dental and primary care professionals to learn and work together. Partnerships among dental and primary care academic and professional organizations would advance these opportunities.

Teaching nurse-practitioners and other primary care professionals to change the steps in the physical exam from HEENT to HEENOT, thus including the oral cavity, as done at NYU, is an important educational step to advance integration ((Haber et al., 2015). Identification of oral health problems or need for prevention is not sufficient unless documented in the patient's chart, communicated to the patient in an understandable way, and followed up with a dental referral and assistance, if warranted, from a patient navigator. Health literacy principles have an important role in this process.

Delivery of pre-licensure education and CE occur in many different formats. Information about the scientific accuracy and assessment of quality of educational materials is usually unavailable. Best educational practices for health professionals need to be identified that lead to long-term provider behavior change to incorporate oral health into primary care practice. Research and evaluation of the effectiveness of educational programs that integrate oral health into primary care education and practice are lacking, both in terms of changes in provider behavior and patient health outcomes. The SFL program is one of the few that keeps metrics of number of participants and has surveyed users to determine if the educational programs have changed practice. The short-term results, based on self-report, are very favorable.

The pathway from health professional education to changes in both provider and patient behavior and ultimately, in patient health outcomes is long. There are many intervening barriers and facilitators. Normative, organizational, and system and functional levels of integration advance efforts. Education of primary care providers that occurs in the context of patient care delivery such as in the implementation of public health programs shortens the pathway. Ultimately, information is needed to determine the impact of education and continuing education on oral health and primary care integration and ultimately on improvement in oral health and overall health.

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**TABLE 4-1** Timeline of Drivers of Change for Oral Health Integration in Health Profession Education Programs, 1995-2017

Year	Agency	Event or Report
1995	Institute of Medicine (IOM)	Report: Dental Education at the Crossroads: Challenges and Change
2000	U.S. Surgeon General	Report: Oral Health in America
2001	North Carolina	Implementation: Into the Mouths of Babes (IMB) program, requires medical provider training of pediatric preventive dental services (approved CME) for Medicaid reimbursement (Rozier et al., 2003)
2001	HRSA	Physician education grants for oral health (Douglass, et al., 2009b)
2003	IOM	Report: Health Professions Education: a Bridge to Quality
2003	Maternal and Child Health Bureau	Funded development of online pediatric oral health training resource for non-dental providers (Douglass, et al., 2009b) <a href="https://www.mchoralhealth.org/OpenWide/index.htm">https://www.mchoralhealth.org/OpenWide/index.htm</a> (accessed 10/30/17)
2003	American Academy of Pediatrics (AAP)	Policy statement regarding “Oral health risk assessment, timing and establishment of the dental home”
2005	Society for Teachers of Family Medicine	First edition of Smiles for Life online oral health curriculum (Douglass, et al., 2009b)
~2005	United States Medical Licensing Exam (USMLE)	Includes oral health questions in steps 2 and 3
2008	AAMC	Report IX: Contemporary Issues in Medicine: Oral Health Education for Medical and Dental Students: Report of an Expert Panel. The report includes eight key topic areas for oral health in medicine for the undergraduate medical education curriculum. <a href="https://aamc-meded.global.ssl.fastly.net/production/media/filer_public/5b/62/5b629cfc-8b4d-40ee-85d42ce71dfc74ae/oral_health_in_medicine_framework.pdf">https://aamc-meded.global.ssl.fastly.net/production/media/filer_public/5b/62/5b629cfc-8b4d-40ee-85d42ce71dfc74ae/oral_health_in_medicine_framework.pdf</a> (accessed 10/30/17 Note: AAMC companion to Report IX)
2010	World Health Organization	Framework for Action on Interprofessional Education and Collaborative Practice <a href="http://apps.who.int/iris/bitstream/10665/70185/1/WHO_HRH_HPN_10.3_eng.pdf?ua=1">http://apps.who.int/iris/bitstream/10665/70185/1/WHO_HRH_HPN_10.3_eng.pdf?ua=1</a> (accessed 7/30/17)
2010	Healthy People 2020	Oral health is included as one of the 12 leading health indicators. (Children, adolescents, and adults who used the oral health care system in the past year. OH-7) <a href="https://www.healthypeople.gov/2020/topics-objectives/topic/oral-health/objectives#5028">https://www.healthypeople.gov/2020/topics-objectives/topic/oral-health/objectives#5028</a> (accessed 6/21/17)
2011	AAMC and HRSA	Building an “Oral health in medicine” model curriculum: call for submissions <a href="http://www.adea.org/mededportal/Documents/Proposals.pdf">http://www.adea.org/mededportal/Documents/Proposals.pdf</a>

		(accessed 10/30/17)
2011	IPEC	Core competencies for interprofessional collaborative practice
2011	IOM	Report: Advancing Oral Health in America
2011	IOM and NRC	Report: Improving access to oral health care for vulnerable and underserved populations.
2013	Commission on Dental Accreditation (CODA)	CODA standards on interprofessional education for predoctoral education (Formicola et al., 2012) <a href="http://www.ada.org/~media/CODA/Files/predoc.ashx">http://www.ada.org/~media/CODA/Files/predoc.ashx</a> (accessed 7/25/17)
2014	US Preventive Services Task Force	Recommendation Summary for prevention of dental caries in children from birth through age 5 years. <a href="https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/dental-caries-in-children-from-birth-through-age-5-years-screening">https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/dental-caries-in-children-from-birth-through-age-5-years-screening</a> (accessed 6/21/17)
2014	HRSA	Report: Integration of Oral Health and Primary Care Practice included oral health competencies for primary care providers. <a href="https://www.hrsa.gov/publichealth/clinical/oralhealth/primarycare/integrationoforalhealth.pdf">https://www.hrsa.gov/publichealth/clinical/oralhealth/primarycare/integrationoforalhealth.pdf</a> (accessed 6/21/17)
2015	AMA	New CPT code 99188 for fluoride varnish. <a href="https://www.aap.org/en-us/Documents/coding_factsheet_oral_health.pdf">https://www.aap.org/en-us/Documents/coding_factsheet_oral_health.pdf</a> (accessed 7/30/17)
2016	IPEC	Updates 2011 Core competencies for interprofessional collaborative practice. <a href="http://www.aacn.nche.edu/education-resources/IPEC-2016-Updated-Core-Competencies-Report.pdf">http://www.aacn.nche.edu/education-resources/IPEC-2016-Updated-Core-Competencies-Report.pdf</a> (accessed 7/18/17)
2017	ADA	New ADA (CDT) Procedure Code for medical dental collaboration: D9311 – consultation with medical health care professional, <a href="https://www.cda.org/news-events/cdt-2017-dental-code-changes-are-here">https://www.cda.org/news-events/cdt-2017-dental-code-changes-are-here</a> (accessed 7/30/17)
2017	Centers for Medicare & Medicaid Services (CMS), state Medicaid programs	All state Medicaid programs reimburse pediatric health professionals for fluoride varnish application. <a href="http://www.pewtrusts.org/en/research-and-analysis/analysis/2011/08/29/reimbursing-physicians-for-fluoride-varnish">http://www.pewtrusts.org/en/research-and-analysis/analysis/2011/08/29/reimbursing-physicians-for-fluoride-varnish</a> (accessed 7/25/17)

**TABLE 4-2** Publications: Oral health content in health professional education programs

Publication First Author, Year	Institution	Program Name/Descriptor	Workforce/Trainees
<b>Undergraduate and Predoctoral Students</b>			
Skelton et al., 2002	Pikeville College School of Osteopathic Medicine and University of Kentucky College of Dentistry	Two-day workshop, oral health clinical diagnosis and case scenarios for osteopathic medical students	DO students
Mouradian et al., 2005	University of Washington (UW)	Oral health curriculum for medical students	MD students
Silk et al., 2009	University of Massachusetts	Smiles for Life oral health curriculum for medical student interclerkship	MD students
McCloskey et al., 2011	Boston University (BU)	Leading Community Health Initiatives: Public health, medicine and dentistry as partners	MD, DDS, MPH students with community partners
Formicola et al., 2012	Six case studies: Western University of Health Sciences (WesternU), Medical University of South Carolina, University of Colorado, Columbia University, University of Minnesota, University of Florida	Interprofessional education (IPE)	DDS students + up to 8 other types of health professions students, lots of variation in professions involved and learning formats
Rosenheck et al., 2012	University of Medicine and Dentistry of New Jersey	Oral health modules in osteopathic medical curriculum	DO students

Dolce, et al., 2012	New York University (NYU)	Oral Health Nursing Education and Practice (OHNEP)	Nursing students
Aston et al., 2012	WesternU (and two others)	IPE	9 health professions
Bowser et al., 2013	University of Colorado	Interprofessional Oral health curriculum for physician assistant (PA) students	PA, dental students and faculty provided instruction
Haber et al., 2014	NYU	Adult NP-managed primary care practice in School of Dentistry	DDS and nurse practitioner (NP) students
Dolce et al., 2014	Bouvé College of Health Sciences at Northeastern University, Harvard	Interprofessional Oral Health: Technology, Instruction, Practice and Service (Oral Health TIPS) program and Program of All-inclusive Care for the Elderly (PACE)	Bouvé Health Sciences students (multiple health professions); Geriatric fellows (dental, medical and behavioral health) care for elderly
Berkowitz et al., 2015, 2017	BU	Oral health curriculum for PA students	PA students; dental students and faculty provided instruction
Haber et al., 2015	NYU	Teaching the HEENOT exam (head, ears, eyes, nose, Oral, throat)	DDS, N, NP, nurse midwife (NM) students
Nicely. 2016	PA program in Virginia (not named)	Oral health curriculum for PA students	PA students; some instruction by dental providers and residents
Gordon and Donoff, 2016	7 case studies		
	University of Toronto, NYU	IPE	DDS students and paramedics
	University of Alabama,	Teaching Oral-Systemic Health IPE Experience	DDS, MD, NP students
	U Illinois, Chicago	IPE	DDS, MD, N, Optometry, PA students
		Collaborative for Excellence in IPE with 7 health science colleges	7 health professions



	Meharry & Vanderbilt	5 institutions, community partners	10 disciplines
	UW	IPE/IPCP, reflection papers	DDS students + others
	WesternU	IPE	DDS, PA students
Dolce, et al., 2017, in press	Northeastern University School of Nursing and Harvard School of Dental Medicine	Nurse Practitioner-Dentist Model	DDS and NP students and faculty

### **Postdoctoral Students, Residents**

Mouradian et al., 2003	UW	Pediatric Oral Health Curriculum	Family medicine residents, pediatric dentistry, faculty, local dentists
Graham et al., 2003	Harborview Medical Center affiliated with UW	Children's oral health in hospital setting	Pediatric providers, pediatric residents, taught by pediatric dentists and pediatric dentistry residents
Jackson et al., 2015	University of North Carolina	Prenatal Oral Health Program	DDS and MD students, OB-GYN residents
Silk et al., 2017	35 health professions education programs in 6 New England states	Pediatric Oral Health Curriculum	PA and MD students, pediatric and family medicine residents

### **Practitioners and Staff**

Rozier et al., 2003	North Carolina	Into the Mouths of Babes	Pediatricians, family physicians, nurses, physicians assistants, nurse practitioners in community health centers were trained
Wolfe et al., 2004	Connecticut Dept. of Public Health, Early Head Start, Head Start, Health Centers	OPENWIDE: Oral health Program to Engage Non-dental health and human service Workers in Integrated Dental Education	MD students, residents, physicians, nutritionists, childcare and outreach workers and others

Wysen et al., 2004	Seattle and King County public health department, community health centers	Kids Get Care Program	Training by dentists for medical providers and vice versa, DH provide support for medical staff, PH nurse, community workers
Riter et al., 2008	Washington Dental Service Foundation and Group Health Cooperative, UW	CE curriculum and elective course for medical students, health promotion and advocacy activities, "children's oral health matters"	MD students, physicians, primary care teams
Ramos-Gomez. 2014	University of California, Los Angeles, WIC, Head Start	Infant Oral Care Program	Pediatricians, nurse practitioners, obstetricians, allied health workers, community-based staff

Table 4-2 Abbreviations

CE: Continuing Education; DH: Dental Hygiene; DO: Doctor of Osteopathic Medicine, DDS (for DDS or DMD): Doctor of Dental Surgery or Doctor of Dental Medicine; MD: Doctor of Medicine; IPCP: Interprofessional Collaborative Practice; IPE: Interprofessional Education; MPH: Master of Public Health; N: Nursing; NM: Nurse Midwife; NP: Nurse Practitioner; OB-GYN: Obstetrician-Gynecologist; PA: Physician Assistant; PH: Public Health; WIC: Special Supplemental Nutrition Program for Women, Infants and Children

**TABLE 4-3** Application of types of oral health integration described in M-RMIC conceptual model to education and continuing education programs for primary care professionals

Type of Integration	Examples in Oral Health Education and Continuing Education for Primary Care Professionals
Clinical Integration	Adoption and implementation of oral health clinical competencies for primary care providers such as those developed by HRSA. ( <a href="https://www.hrsa.gov/publichealth/clinical/oralhealth/primarycare/integrationoforalealth.pdf">https://www.hrsa.gov/publichealth/clinical/oralhealth/primarycare/integrationoforalealth.pdf</a> ) Non-dental professionals learn during initial training or continuing education about oral health and develop clinical skills (e.g., to conduct an oral health evaluation, oral cancer screening, risk assessment, fluoride varnish application, and patient education about how to maintain good oral health).
Professional Integration	Interprofessional education (IPE) involves students or clinicians from two or more health professions learning and working together as part of their professional training or patient care. The formats include small groups or teams discussing case scenarios, diagnosis and treatment for simulated patients or actual patient care that includes an oral health component. Non-dental students learn how to refer patients to oral health providers as part of comprehensive care. Dental professionals teach non-dentists about oral health as part of patient care. Oral health or non-dental associations provide oral health training and educational materials for non-dental professionals and promote collaboration and/or integration across professions.
Organizational Integration	An oral health curriculum is implemented for a non-dental educational program; faculty from two or more schools develop an oral health curriculum and co-teach. Students from different schools take a course together and the course is co-listed in both schools for course credit; the schools or educational programs work together for scheduling courses and activities and proportion faculty teaching credit, and student tuition for IPE activities. Appropriate contracts or MOUs are in place for students working together in community or other off-campus sites. Interprofessional organizations provide educational opportunities, or two or more professions/organizations host a conference or webinar about oral health. Continuing education courses are available for multiple professions to attend together and different professional continuing education credit is available (e.g., ACCME, ACPE, ANCC).
System integration	Health profession accrediting organizations require demonstration of IPE and an oral health component in non-dental health professional curriculum; medical licensing bodies include oral health questions on licensing or specialty board exams. External funding for program implementation. Regional activities are a result of legislation or state board policies; Medicaid billing codes and equitable reimbursement for oral health services is available to non-dental providers. Organization provides funding or develops policies and guidelines to promote integration of oral health and primary care.
Normative	Mission and vision of the participating schools' leadership value integration and incorporate such activities in budgeted programs. A non-dental organization establishes an oral health initiative or member interest group.

Functional	School administrative-support personnel coordinate operations. Common electronic patient health records are used for medical and dental care. Oral health questions are added to the medical history. Non-dental associations provide links to oral health resources on their websites.
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**TABLE 4-4** Organizations belonging to the Interprofessional Education Collaborative (IPEC) and assessment of their websites for oral health educational materials

	OH page	OH CE	some OH info	links	None
<b>Founding IPEC Members in 2009</b>					
American Association of Colleges of Nursing (AACN)				1	
American Association of Colleges of Osteopathic Medicine (AACOM)				1	
American Association of Colleges of Pharmacy (ACCP)			1		
American Dental Education Association (ADEA) (excluded from count)					
American Association of Medical Colleges, MedEdPORTAL publications (AAMC)	1			1	
Association of Schools and Programs of Public Health (ASPPH)				1	
<b>IPEC Members Added in 2016</b>					
American Association of Colleges of Podiatric Medicine (AACPM)					1
American Council of Academic Physical Therapy (ACAPT)					1
American Occupational Therapy Association (AOTA)					1
American Psychological Association (APA)					1
Association of American Veterinary Medical Colleges (AAVMC)					1
Association of Schools and Colleges of Optometry (ASCO)					1
Association of Schools of Allied Health Professions (ASAHP)					1
Council on Social Work Education (CSWE)					1
Physician Assistant Education Association (PAEA)					1
<b>Total (n=14 excluding ADEA)</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>9</b>

**TABLE 4-5** Professional Associations by Type of Integration Activities Posted on Their Website Demonstrating Oral Health Integration into Primary Care

<b>Type of Integration</b>	<b>Professional Association (see text for full name of organization)</b>
Clinical	AAP, AACP, AACPM, NDA, NNOHA, STFM
Professional	AAPA, AACP, AAMC, AAFP, ACOG, ADHA, APTR, GSA, SAMHSA-HRSA, NAPNAP, NASN, NIOH, OHRC, STFM
Organizational	GSA, HDA, MSDA, NOHIIN, SAMHSA-HRSA
System	ABPM, HRSA, nccPA Foundation, NIDCR
Normative	ADEA, NNOHA, AAPA, AAP, STFM, AAMC, HRSA, GSA, NASN, PAEA, AAFP
Functional	AACN, AAFP, AAMC, AANP, AAP, ACL/AoA, ACNM, ACOG, ACOM, ACPM, ADA, ADEA, AHRQ, AMA, ASPPH, GSA, HRSA, MSDA, NACHC, NASN, OHRC, PCPCC, SAMHSA-HRSA
None, minimal, or could not be determined	AANP, AAVMC, ACAPT, ACCP, AGD, AIHC, ANA, AOA, AOTA, APA, Apha, APHA, ASCO, ASAHP, ASHP, CSWE, NCIPPE, SGIM

Note: Some organizations are listed in more than one category.

## Overview and Presentation of Integration Case Studies

### INTRODUCTION

As part of this environmental scan, we have identified a number of existing programs and practices and professional educational efforts that connect the traditionally siloed systems of medical and dental care. Four case studies were conducted to provide more detailed descriptions of different integration programs that bridge the medical-dental divide. This overview summarizes the four case studies, showing similarities and differences across the elements of integration that they demonstrate, barriers and facilitators to integration encountered, and their plans for expanding their integration efforts. The four comprehensive case studies follow this overview.

### METHODS

#### Selection Criteria for Cases

The three authors developed the case selection criteria. Criteria included: 1) an innovative or novel approach, 2) an established and ongoing program, 3) performance measures collected to demonstrate a real or potential impact on a large population, 4) had not been documented in a case study, and 5) collectively represented different levels of oral health integration into primary care. When selecting among a variety of options, we aimed for a mix of cases that would provide variation in geography, type of organizational setting and delivery system, population served, and program duration. The process was to explain the project to an initial organization contact person who then sought approval from the organization's leadership for participation in the project.

#### Data Collection

A structured interview guide was developed and modified to fit the different participating organizations. Questions were asked to obtain information about the organization's history, mission, motivation and philosophy for integration, description of the program, components of integration utilized using the six types of integration in our M-RMIC conceptual model, performance measures or other metrics used, health literacy considerations and applications, barriers and facilitators to integration, and future plans.

The interview guide was sent to interviewees in advance. Websites were reviewed and other relevant documents and PowerPoint presentations that were provided by the organizations. Interviews were conducted by telephone or in person (in North Carolina) by two or three case report authors for each case. We requested interviews with at least one person representing the dental operations and one the medical operations, and usually a staff person involved with integration efforts. The authors interviewed three to six people for each case study. Each case had additional people seeking outside information. The organization selected the people to participate. A draft of each case study was sent to participants for their review of report accuracy and to provide any missing information.

## RESULTS

The four case studies were:

Into the Mouths of Babes (IMB), a statewide program in North Carolina was developed almost two decades ago to address the high incidence of early childhood caries and access to care issues among young children enrolled in Medicaid. After receiving training, primary care providers in medical offices provide pediatric preventive oral health services and refer these young children to a dentist. Medicaid reimburses physicians for these services.

HealthPartners (HP) is an accountable care organization primarily based in Minnesota. For 60 years, it has been integrating dental and medical services through its ability to both provide and deliver medical and dental insurance and health care. Recent initiatives of medical-dental integration have been developed for enrollees with diabetes, hypertension, and pregnancy.

Grace Health (GH) is a federally qualified health center (FQHC) in Battle Creek, Michigan. The clinic developed and implemented the Maternal Infant Oral Health (MIOH) program to increase access to dental care for pregnant women by co-locating and integrating dental hygienists in their OB/GYN clinic.

Willamette Dental Group, a Dental Care Organization (DCO) in collaboration with Samaritan Health Plans- InterCommunity Health Network (IHN) Coordinated Care Organization (CCO) began their oral health-primary care integration because of state-mandated health care reform for the Medicaid System in Oregon (OR). Integration efforts by the collaborators (W-IHN) have already started to address opioid prescribing, access to dental care for patients seen for non-traumatic dental problems in the Emergency Department, pregnant women, patients with diabetes, and provision of preventive oral health services for children.

The characteristics of these four organizations are summarized in Table 5-1.



Two cases represent mature programs that have been in operation for a long time (HP and IMB) whereas two are relatively new (GH and W-IHN). The programs geographically distributed across the country. Each represents a different type of healthcare organization and delivery system, a single FQHC in Michigan, private medical practices and public clinics across North Carolina, a large scale ACO in Minnesota, and statewide Medicaid reform in Oregon that links a medical CCO with a DCO. The populations served include low-income or Medicaid enrollees and enrollees of employer-based insurance. Importantly for this project, each case illustrates different aspects of integration.

Integration efforts generally focus on a specific target population to improve access to dental care and improve health. HP and W-IHN use the evidence for oral health-systemic health connections to address the oral health needs of patients with chronic medical conditions, specifically, diabetes. They also include integration programs like the one at GH to improve the oral health of pregnant women and GH and IMB to prevent dental caries in young children. HP and W-IHN are looking at the larger population perspective of developing programs to address the Triple Aim.

Different types of integration are illustrated in these case reports. The IMB is a good example of clinical integration. Non-dental health professionals are providing and being reimbursed to provide preventive oral health services for young children. The in-person training is conducted by a dental hygienist, indicative of some professional integration. Organizational integration is apparent because Community Care of North Carolina (CCNC), the NC Oral Health Section and the NC Division of Medical Assistance all collaborate for program implementation. The vision and leadership to initiate this program many years ago exemplifies normative integration.

The program at GH predominantly features professional integration. Dental hygienists are co-located with an operatory in the OB/GYN wing of the health center and can see women in their operatory for clinical services as part of the OB/GYN visit. However, they provide health education and follow-up in the OB/GYN exam rooms during scheduled OB/GYN visits as well as during the CenteringPregnancy group model of prenatal care. They refer women who need dental care to the dental clinic in the Health Center and can make their dental appointment from the shared electronic health record system.

Organizational, clinical and financial integration efforts at HP are most feasible for people who have both HP medical and dental coverage. Almost everyone with HP dental coverage also has HP medical, but the reverse does not apply. Integration benefits diabetic patients who can receive periodontal care without co-pays or maximums. Although HPs dental costs will go up, they expect expensive medical services for hospitalizations, emergency room visits and eye

disorders will go down. By operating both the financial and delivery sides, they can optimize the cost.

The Transform Oregon mandate from the state to integrate physical, behavioral and oral health care for Medicaid enrollees is an example of system integration. They have to meet performance measures established by the Oregon Health Authority and CMS. Both the Willamette Dental Group and Samaritan IHN-CCO have complimentary missions to provide pro-active, coordinated, whole-person care to promote health and wellness. They are forging ahead to provide clinical integration to address areas where oral health and other aspects of physical health intersect. They are now working on ways to address intersections of oral health and behavioral health.

### Barriers Encountered

#### *Communication Issues, Lack of Inter-operable EHRs, Difficulty with Scheduling and Referrals.*

Some of the barriers to integration they encountered were common to multiple programs. Communication challenges across organizations and disciplines within the same organization affected integration activities. New health information systems had to be developed to integrate medical and dental electronic health records and accommodate patient scheduling, monitoring, tracking, and referrals. This key component of functional integration is accomplished on a continuum, without full integration being reached. HP is planning to roll out an integrated EPIC® EHR system this fall that will alleviate many challenges.

In Oregon, the lack of integrated electronic communication across organizations was a barrier for making referrals and confirming that the patient was scheduled or seen. There was no direct way for each system to make appointments for patients in the other system. Medical staff did not like calling the dental clinic and being placed on hold, and were used to being notified if a referral was successful. Some health IT functions were incorporated, but overcoming this barrier is still a work in progress. At GH, scheduling dental appointments from OB/GYN was initially a barrier, but was addressed when the shared EHR was able to be used for making appointments. Referral from a medical office to a dental office was a barrier in the IMB program. Referral guidelines were developed and several approaches and support tools developed to create collaborations and referral networks, but communication between medical and dental offices with no connecting infrastructure continues to be a challenge for providers and patients. Oral health modules that included referral guidelines were developed for use as part of quality improvement activities and maintenance of certification. Lack of infrastructure to facilitate communication, referrals and scheduling is an integration challenge for separate systems.

### *Continuing Education.*

Providing continuing education to give medical providers new oral health knowledge and skills was another challenge. In W-IHN, a grant to host CE based on the Smiles for Life national oral health curriculum was successful for training nurses, medical assistants and diabetic care coordinators, but did not reach all providers. Both in W-IHN and GH providers were encouraged to use the SFL online modules to learn about oral health, but lack the time to do so. The IMB program initially provided group trainings at common locations, but eventually switched to providing training to medical teams in their individual practice settings. Providers did not want to take the time to travel to distant location and more staff could attend if training was provided on-site. A carrot and stick approach, required training for Medicaid reimbursement, and available free CME credit helped to get training in place.

### Facilitators

#### *Leadership.*

The cases also shared common facilitators. For all four situations, there was a common vision that many patients who could benefit from dental services were not receiving care, and that good oral health is an important part of health. Strong leadership encouraging integration, oral health champions, and an organizational mission that included overall health and wellness were all important. In the IMB program, oral health changed from being an “add-on” at the beginning to an integral part of well-child visits. Similarly, at GH, dental hygiene visits became an integral component of pre-natal care. At HP and W-IHN, dental teams now check to see if diabetic patients have seen their medical provider, and medical providers ask about dental visits.

#### *Scientific Evidence.*

Research and evidence-based guidelines provide the rationale for integration initiatives. Scientific evidence showing the benefit of fluoride varnish in preventing early childhood caries facilitated the adoption of this procedure in pediatric medical practices. State and national guidelines for oral health care during pregnancy, affirming that it is both safe and warranted, helped to overcome myths that pregnant women should not receive dental care. Research demonstrating the bi-directional connections between diabetes and periodontal disease provided reasons for integration efforts; diabetes increases the risk of periodontal disease, and reducing inflammation in the mouth helps with diabetic control.

#### *Workforce: New types of oral health providers.*

In all of these programs, a non-dentist workforce providing oral health services facilitated integration. At GH, dental hygienists with a special permit provide preventive dental services to underserved populations with indirect dentist supervision. In Oregon, expanded practice permit dental hygienists work in medical offices. At HP, dental therapists in Minnesota provide

preventive and limited restorative dental care at lower cost than dentists do. In the IMB program and throughout the country, medical providers can be trained and receive Medicaid payment to provide pediatric preventive dental services. As with any new program, new workflows needed to be developed and new procedures integrated into existing routines to accommodate these activities.

#### *Financial incentives.*

Funding sources are needed to start and sustain new programs. An initial source of funding from the Blue Cross and Blue Shield of Michigan Social Mission Department provided program start-up aid to GH.. The IMB program got its start with funding from the Appalachian Regional Commission in collaboration with the North Carolina Partnership for Children and the North Carolina state dental public health program prior to statewide expansion through the state Medicaid program. Transform Oregon was supported by numerous factors, including a CMS waiver and support of \$1.9 billion to launch the state mandated program, a global budget combining physical, behavioral and oral health, performance measures and the possibility of financial incentives for meeting targets were integration facilitators. HP anticipates financial benefit for providing periodontal services to their diabetic medical patients and medical provider reimbursement for FV to cover the cost of providing the service.

#### *Community Service.*

A strong community service orientation has served as a motivating factor to provide health services in a new way that will better address health disparities and improve wellness. GH describes their mission is one to look for gaps in the health care system and try to fill them to provide the best health care to their community. Pregnant women were having difficulty getting access to dental care, so they developed the MIOH program to address this need. The hygienists' salaries are included in the operational budget because the program is viewed as being beneficial for the women. At HP and OR, community service is extending beyond clinical services to address social determinants of health. HP helped start a traveling grocery store to sell healthy food in communities located in food deserts. They arrange for temporary housing for people discharged from the hospital who are homeless. W-IHN instituted a system of transportation benefits to help people with transportation difficulty access their provider appointments. They are considering ways to assist with housing and food deserts.

### Health Literacy

Health literacy was addressed as an organizational goal or value at all locations. Patient education was an important component in all of the scenarios. Some of the organizations had a Patient Education or Health Literacy Committee that viewed all patient education materials for compliance with health literacy standards. HP offers rewards and perks for Medicaid patients with positive health behaviors. Nurse navigators reach out to patients who have not had a dental

visit to educate them about the importance of oral health. W-IHN and HP have communication or cultural competence training for staff. W-IHN provided help to patients with navigating the complex health care system. Many of the programs employ patient satisfaction surveys that include questions about patient understanding of information and treatment.

### Future Plans

All organizations have goals or plans to expand integration activities. IMB would like to expand the age range from 3.5 years to children age 5 or 6, develop interventions to improve well-child visit rates and provider adoption of IMB, increase referrals between provider types and switch to other types of provider training. At HP, once their medical and dental EHRs are integrated they will be able to assess whether cost reduction occurs with integration activities. Both HP and GH plan to expand integration with their pediatric well-child visits. W-IHN will continue the integration process with patients with diabetes and with pregnant women, and is considering ways to expand efforts for patients with heart disease and severe mental illness.

### Case Study Limitations

There are three major limitations to these case studies. First, they are exemplar case studies, not generalizable to all integration initiatives. They were selected to be examples of programs that have overcome initial barriers and appear to be accomplishing the goal of integrating oral health and general health. At each location, the implementation process continues to be refined as feedback is received and lessons are learned. Second, the authors selected the programs for the case studies but did not select the specific people to be interviewed. Each organization selected the administrators and staff deemed relevant and knowledgeable, although we made specific requests for types of people to interview. Nonetheless, we may have not been connected to and interviewed people who *have different levels of support for the oral health integration process than those interviewed*. Third, these activities are evolving rapidly. These case studies reflect a single point in time in the integration developments in these organizations.

### Summary

These four organizations have integrated oral health and primary care in different ways. However they share many common elements. Visionary leadership, passionate oral health champions, and an organizational mission to improve overall health for their population were all key features. Scientific evidence of effective prevention and treatment modalities, and identification of unmet health needs that could be better addressed in a team approach across disciplines, helped overcome some initial resistance to changes. All programs struggled with initial lack of interoperability of medical and dental electronic communication systems and EHRs. New workforce models and new ways of financing care were key elements of some of the programs. Health literacy considerations were incorporated into program implementation, but did not play a major role in the process and were focused mostly on patient education

materials. Everyone interviewed was enthusiastic about these integration efforts to include oral health in primary care and the organizations desire to expand these activities.

**TABLE 5-1** Characteristics Represented by Case Studies

<b>Characteristic</b>	<b>Case 1 – Into the Mouth of Babes (IMB)</b>	<b>Case 2 – HealthPartners (HP)</b>	<b>Case 3- Grace Health (GH)</b>	<b>Case 4- Willamette Dental and Inter- Community Health Network - Transform Oregon (W-IHN)</b>
Novel approach	Primary care providers deliver preventive oral health services	Costs waived for periodontal care for patients with diabetes who are enrolled in HP medical and HP dental plans	Dental hygienists co-located in OB/GYN suite and providing preventive services as part of the primary care team.	Trying to develop a virtual Patient Centered Health Home
Predominant integration feature	Clinical	Clinical and organizational	Professional	System
Patient population involved	Children 0-3 ½ years of age enrolled in Medicaid.	All patients	Pregnant women, secondarily young children	All patients
Organization Type	Private medical practice, public clinics & academic training programs	ACO	FQHC	CCO
Geographic Location	North Carolina	Minnesota and parts of Wisconsin, Iowa	Battle Creek and Calhoun County, MI	Linn, Benton, and Lincoln counties, Oregon
Program Initiation	Pilot test in 1998-2000; statewide in 2001	Founded in 1957	2014	2014
Types of providers	Physicians, physician assistants, nurses	Medical, Pharmacy, Dental	OB/GYN and dental hygienists	Medical, Dental, Nursing, Expanded function DH
Addresses access to care issues	Statewide	Rural areas	Pregnant women	Rural areas, pregnant women, diabetic patients
Initiating /funding organization	Partnership of state agencies with support from multiple federal, state and philanthropic groups	Not applicable	Initial funding from Blue Cross and Blue Shield of Michigan Social Mission Department	CMS
Application of	Some providers	Shared EHR for	Shared EHR and	Shared EHR for

EHR	adapted program recommended risk assessment forms to their EHRs	oral health education screening and access to Regional Health Exchange	ability to schedule dental appointments from OB/GYN clinic	oral health education screening and access to ED Information Exchange
Potential bidirectional activities (e.g. diabetes, ED diversion)	Guidelines facilitate dental referrals	Diabetes, Opioid prescribing, pregnant women	Women with dental needs referred to GH dental department or dental home	Diabetes, opioid prescribing, pregnant women, oral health education
Integration Facilitators	Widespread recognition of problem, Partnership, Adequate funding Full-time project staff, Evaluation of outcomes	HP provides insurance and services, benefits to enrollees with HP medical and dental coverage	Michigan PA-161 permits dental hygienists to provide preventive services under indirect supervision	State mandate for integration, performance measures,
Applications of Health Literacy	Recommended patient education materials in training; facilitated referral navigation with case workers in some practices	Patient education materials, rewards for positive health behaviors, nurse navigator, Patient Education group	Patient education materials designed for low HL level, extensive dental clinic hours 7 am-8 pm M-Sat.	Patient navigators, cultural competence training for staff, marketing team reviews education materials
Financing of services	Medicaid reimbursement for bundled services (risk assessment, clinical evaluation, counseling, fluoride varnish, referral)	Employer-based insurance, Medicaid	Medicaid, FQHC sliding fee scale, patient education not reimbursed	Medicaid



## Case Study 1

### Into the Mouths of Babes

*A North Carolina Program to Integrate Preventive Oral Health Services into Primary Care*

#### INTRODUCTION

This case study features Into the Mouths of Babes (IMB), an initiative in North Carolina in which preventive oral health services (POHS) are integrated into pediatric primary care. North Carolina (NC) was an early adopter of a Medicaid policy to pay primary care physicians to deliver preventive services for young children. All 50 states now have reimbursement policies to pay these providers for some POHS, most consistently covering fluoride varnish applications. We feature this initiative because it represents an example of long-standing, statewide efforts to integrate oral health into primary medical care for pediatric populations, and displays steady evolution as it has matured. It is a model of integration that has the potential to reach large numbers of children in the United States at a very young age with effective preventive oral health services when they otherwise would be unlikely to receive them. This integration model emerged in the late 1990s as a response to the high disease levels among young, low-income children and their limited access to the dental care system.

#### CASE STUDY METHODS

This case study was selected because it meets a number of our pre-specified criteria for inclusion: (1) established and ongoing with the opportunity to observe all stages of implementation and sustainability; (2) implementation process that is well documented; (3) integration performance measures and outcome studies; and (4) the potential for wide-scale national implementation and impact on the targeted population.

Sources of information gathered and analyzed:

1. Review of program documents, project reports and program statistics
2. Literature review and scan of Internet
3. Interviews by two of the case report authors with: (1) Kelly Close, MHA, RDH, Early Childhood Oral Health Coordinator, Oral Health Section and Chair of the statewide Early Childhood Oral Health Collaborative (ECOHC), the advisory committee for ECC initiatives in the state; (2) Kern Eason, MBA, Pediatric Program Manager, Community Care of North Carolina (CCNC); (3) Marian Earls, MD, Medical Director, who oversees

pediatric programs and a provider of IMB services, CCNC; (4) Mark Casey, DDS, MPH, Dental Officer, NC Medicaid Program, Division of Medical Assistance

4. Review and feedback of draft by key architects and partners in the IMB program

The information from our review of available documents, interview notes and feedback on the draft case solicited from key partners was summarized in the final document according to our case study guidelines. Information for the case study and its analysis and reporting took place during June 2017, close to two decades since parts of the integration model were first implemented in North Carolina.

## FINDINGS

### Partnership Agencies and their Motivation for integration

The IMB program is supported by multiple, strong partnerships committed to the health and well-being of young children. The state Medicaid program is responsible for policies related to the IMB program and payment of providers. The state dental public health program is the agency primarily responsible for coordination of training, including preparation and updating of educational materials. Community Care of North Carolina, the Medicaid medical provider network incorporates oral health into its quality of care initiatives. Evaluation studies have been undertaken primarily by the University of North Carolina at Chapel Hill. Other important partners like the NC Pediatric Society and the NC Academy of Family Physicians support the program through their advocacy efforts. The Early Childhood Oral Health Collaborative (ECOHC) provides advice about IMB policy and expansion of oral health programs for children ages 0 to 5 years in the state. In addition to the organizations already mentioned, its membership includes representatives from Head Start, East Coast Migrant Head Start, NC Child, NC Partnership for Children, and Blue Cross Blue Shield of NC Foundation among others.

The integration of POHS into primary care was motivated by the recognition in the late 1990s that untreated dental caries in young children was a public health crisis. The NC Institute of Medicine Task Force on Dental Care Access (1999), chaired by the Honorable Dennis Wicker, NC lieutenant governor reported that:

- only 16% of dentists in the state actively participated in Medicaid;
- the state ranked 47<sup>th</sup> in the supply of dentists to population;
- only 47 pediatric dentists practiced in the state;
- 40 of the state's 100 counties had no dentist providing Medicaid services; and
- 79 counties qualified as nationally recognized dental professional shortage areas.

On the demand side, the population was increasing in size with growing income disparities and resulting larger Medicaid enrollments. About one in every four children entering kindergarten had untreated decay and rates were not improving as they were for older children. Dental caries experience in primary teeth reached 90% in some elementary schools. Framing the problem effectively was bolstered by national documents like the Surgeon General's Report on Oral Health and Healthy People 2010, which for the first time included a national objective on reducing dental caries in preschool children.

Commenting in 2005, Dr. John Stamm, Dean of the UNC-CH School of Dentistry at the time, describe the situation like this: "*It is now clear that North Carolina has changed dramatically since the mid-1970s, and for many persons in the state gaining access to needed and adequate dental, oral and craniofacial health care has become a more difficult and/or unaffordable proposition.*" He further concluded that a "*...severe shortage of dentists...has emerged in North Carolina...*" (Stamm, 2005).

As a result of the collective impact of these trends and the growing awareness among leaders in the state, addressing oral health problems of children in North Carolina became an urgent priority.

#### North Carolina's Philosophy for Integration of Oral Health and Primary Care

Increasing the supply of dentists relative to the growing population, training the existing workforce to provide care for young children, and transforming Medicaid so that dentists would be more likely to participate were all viewed as long-term strategies when an immediate solution was needed for young children and their families. In searching for solutions, advocates observed that most children have numerous well-child visits during the first 3 years of life compared to a small number with dentist visits. At the initiation of the IMB program, only 12% of 1-5 year old children enrolled in Medicaid used dental care. Nationally, fewer than 2 out of every 1,000 children younger than 2 years of age had a dental visit in a typical month compared to 362 per 1,000 who made a visit to a physician's office (Schulte et al., 1992).

The goals of the IMB program as originally proposed were to: 1) increase access to preventive oral health services for low-income children 0-3 years of age; 2) reduce the prevalence of early childhood caries (ECC) in low-income children; and ultimately 3) reduce the burden of treatment needs on a delivery system stretched beyond its capacity to serve young children. These goals easily fit with the mission statements of all the partners. For example, ECOHC is "*...dedicated to improving the quality of life for children ages birth through five and their families by promoting good oral health.*" The provision of POHS is aligned with the philosophy, frequency and content of well-child visits.

## Integration of POHS into Primary Care in the IMB Program

Early experiences in the development of IMB have been described in an initial publication (Rozier et al., 2003). The integration concept was proposed first and pilot tested in 1998 to 2000 by the North Carolina Partnership for Children, a nonprofit agency responsible for a state-funded early education program, working in collaboration with the North Carolina state dental public health program with funding from the Appalachian Regional Commission. Its success led to statewide expansion through the Medicaid program in 2001.

Childcare advocates in particular saw integration of POHS into well-child visits, although untested, as a logical approach to help resolve the oral health problems of young children who had limited access to dental care. Dr. Rebecca King, state dental director when the idea was conceived and one of the architects of the program, commented on the early development of this innovation: *“No one had any better ideas for providing access to oral health services for infants and toddlers!”*

### *Clinical Integration.*

Pilot testing at the local level helped define the scope of oral health practices for primary care physicians in the absence of national, consensus best practice guidelines. Further testing among more than 107 practices helped inform the development of Medicaid policies and payment mechanisms (Slade et al., 2007). Barriers to implementation were identified and strategies for addressing them incorporated into training so that POHS could more easily be integrated into a busy medical practice (Close et al., 2010).

Today, pediatricians, family physicians and other medical providers in private offices, community health clinics and health departments can be paid by North Carolina Medicaid for up to 6 visits to provide POHS (oral evaluation; counseling of caregivers; risk assessment; referral, as needed and fluoride varnish application). Services can be provided for young children from the time of tooth eruption to 3 ½ years of age (initially 3 years). The application of fluoride varnish must be accompanied by an oral evaluation, risk assessment and counseling to be eligible for payment.

Providers must receive approved training to qualify for payment of services. This training consists of a continuing medical education (CME) course taught by Kelly Close and approved by the American Academy of Family Physicians and the American Medical Association for 1 hour of equivalent credit. Sessions are offered in the medical office and consist of a didactic portion regarding the clinical services, an administrative section on Medicaid billing and other requirements, and a clinical demonstration of fluoride varnish application. An “oral health toolkit”, initially paper but now electronic, containing information provided in the training session and helpful resources is provided to the practice.

### *Professional Integration.*

This model of integration depends heavily on the establishment of effective linkages between medical and dental practices to ensure continuity of care. The consequences of the two highly separated systems are no more apparent than in the integration of dental services into primary care for children. Some high-risk children need treatment during the targeted ages and all children will need to have a dental home by 3 years of age or earlier in those communities where sufficient dental workforce is available.

IMB program activities now address strategies to help facilitate the collaboration between the medical and dental communities, particularly as the workforce crisis has eased in some areas of the state. Children who have a medical referral for dental services are more likely to have a dentist visit than those who are not referred, but physicians are known to under-refer. Evaluation of the IMB program demonstrated that those who received POHS before 3 years of age were less likely to use dental care after 3 years of age than those who had dental services before 3 years of age. These observations provided evidence of the need for effective referral strategies (Kranz et al, 2015). Participants in the interviews commented that IMB is becoming a “dental home” initiative and pointed out some of the activities underway to help ensure that children have a dental home at the recommended age.

In one project (Carolina Dental Home) referral guidelines were developed jointly by physicians and dentists practicing in a 3-county area. Inter-professional learning collaboratives were held in which these physicians and dentists discussed oral health strategies and how they could work together. Case managers from a large medical practice helped facilitate the referral process and ensure that families who were referred for dental care received dental services. In another project funded by the Children’s Health Insurance Program Reauthorization Act of 2009 (CHIPRA), a “meet-and-greet” approach was used to initiate community collaboration among physicians and dentists. These approaches can be effective, but require resources to “create” an infrastructure that will help facilitate integration of the medical and dental systems allowing continuity of care. Dr. Earls noted that the shortage of dentists that physicians often cite as a barrier to referral is more of a perception of a shortage than a real one in many communities.

### *Organizational Integration.*

North Carolina has hundreds of individual general dentistry practices with little infrastructure linking them together, which makes integration strategies difficult to implement for the dental side at the organizational level. The state dental public health program has a small number of community-based dental hygienists available for collaboration. In comparison, medical practices are much more numerous and more likely to be part of an established infrastructure. The CCNC organization, for example, includes 14 networks covering all 100 counties. It has more than 5,000 primary care medical providers serving mostly Medicaid enrolled populations.

Among the goals of CCNC are the promotion of best-practice guidelines and support of practice-level quality improvement activities within its networks. The CCNC organization made quality improvement of POHS in network practices part of its core activities. It adopted medical fluoride varnish rates and dentist visits for patients using network providers as two of its quality improvement metrics. These practice- and network-level performance measures are made available to practices on a quarterly basis. According to Dr. Earls, practices with low performance can be identified and targeted for improvement.

Quality improvement (QI) facilitators in each network were trained in oral health as part of the CHIPRA grant. Later, training included joint sessions with the facilitators and public health dental hygienists, with the goal of combining the knowledge and skills of quality improvement specialists in practice-level change with the oral health knowledge and skills of community-based public health dental hygienists. This integration of primary care QI specialists and public health oral health experts is logical but challenging because of difficulties each has in overcoming their lack of confidence in taking on a new role in a new discipline.

Finally, CCNC as a general policy promoted risk assessment and referral guidelines and use of support tools (Priority Oral Health Risk Assessment and Referral Tool—PORRT and instructional video) developed with Federal funding. In the CHIPRA grant, an oral health module was developed and made available to providers for use in meeting Maintenance of Certification (MOC) requirements as a quality improvement project. During 2011-2015, more than 100 individual medical clinicians completed the MOC IV course requirements in oral health.

#### *Systems Integration.*

Policy decisions about POHS are fully integrated into the policy-making process at the Division of Medical Assistance. The North Carolina Medicaid program establishes formal policies for POHS benefits and payment, as well as the type of training required for payment. The dental director, Dr. Mark Casey, relies heavily on the ECOHC advisory committee for recommendations. Systems level changes have been made in response to results of evaluation studies and observations in practice. For example, the initial upper age restriction for payment of POHS was 36 months. When research indicated that at least 4 visits were needed for positive outcomes and that the 36-month well-child visit often occurred after 36 months, the upper age limit was raised to 42 months of age.

Billing and payment mechanisms are fully integrated into the medical system. Physicians bill on the medical claim and are paid for POHS from the medical budget. Codes have evolved over time to better accommodate medical billing and services that are provided, such as caries risk assessment. Although not used for the IMB program, a national CPT code for fluoride varnish has been approved, which should facilitate payment for this service by private insurance

companies. The payment mechanisms created by public insurance programs have paved the way for medical providers to bill private insurance companies for this service. Blue Cross and Blue Shield of North Carolina began reimbursing its medical providers for fluoride varnish applications in 2015, and the number of visits with fluoride varnish already are approaching those of dentist rates.

Implementation of the IMB program did not require any changes in professional practice acts in North Carolina. The scope of practice for physicians allows them to provide oral health services. Other integration models would have been more difficult to implement because of provisions in the dental practice act. For example, North Carolina does not permit a physician to supervise a dental hygienist. So a co-located physician-dental hygienist integration model like the one being tested in Colorado was not considered feasible for North Carolina in the short-term (Braun & Cusick, 2016).

Events at the national level can influence activities to integrate oral health into primary care at the state- and local-levels and their effectiveness. For example, the United States Preventive Services Task Force (Moyer, 2014) concluded that there is sufficient evidence of effectiveness in caries reduction to support the medical use of fluoride varnish for all children 0-5 years of age. Fluoride varnish and other POHS are recognized as essential components of a well-child visit in Bright Futures. Provisions in the Patient Protection and Affordable Care Act (ACA) of 2010 tied essential services to those services determined by the US Preventive Services Task Force to be effective, leading to the requirement that private insurance companies reimburse for some POHS.

#### *Normative Integration.*

Integration is facilitated by the opinions held by physicians about the dental caries problem in young children and their potential for contributing to its improvement. From the beginning of IMB, physicians reported seeing many infants and toddlers in their practices with untreated tooth decay. They considered these children to be sick. Without the ability to refer them to a dentist, they also saw it as their responsibility to provide any POHS that might help combat the statewide problem. Dr. Earls, a pediatrician who practiced in an urban pediatric practice with large numbers of Medicaid patients commented that *“POHS are essential services that are part of the well-child visit for children, not an add-on.”*

The positive opinions held by physicians about provision of POHS in medical settings were supported by parents and staff in community programs that have some responsibility for referring children to physicians. Initial concerns centered on whether parents would support physicians providing these services because of their likely surprise in having them offered at a medical visit. In a survey of parents whose children received POHS in medical practices and who completed the Consumer Assessment of Health Plans Survey (CAHPS), 92% reported that the medical provider usually or always explained things in a way they could understand, and

84% reported that the provider spent enough time with their child. Seventy-seven percent rated their overall satisfaction with their child's dental care greater than 7 on a 0 to 10 scale with 10 indicating the best care (Rozier et al., 2005). In another study, the majority of Early Head Start teachers and staff believed that physicians and nurses can provide preventive dental services (66 percent) and identify dental problems (52 percent). (Mathu-Muju et al., 2005)

Differences between dentists and physicians about who they believe should be referred present an under-recognized barrier to effective medical referral of young patients for dental services (Long et al., 2014). Physicians report priority referral of those patients showing obvious signs of disease, which would be similar to how they would deal with patients having other diseases or conditions for which they are unable to care for in their practices. In contrast, dentists recommend that physicians refer patients before they get disease. These opinions and their divergence can interfere with the linkage needed in the integration of POHS into primary care. It is important that physicians and dentists in each community reach a common understanding on referral criteria.

#### *Functional Integration.*

POHS provided during the medical visit can be divided among the medical team. According to Medicaid policy, physicians or physician assistants must do the screening and risk assessments, determine oral health status and decide on referral recommendations. However, nurses can provide fluoride varnish and counseling services. Most physicians provide all the services, finding it useful to integrate counseling messages targeting common risk factors for dental and medical risks.

The initial training and supporting toolkit provided a recommended 'encounter form' that help guide the provider in documenting oral health status, identifying risk factors to target with counseling, and recording referral recommendations. It was widely used in the initial stages of the IMB program. The encounter form evolved into a risk assessment form designed to establish child risk status and need for priority referral in communities with limited dental resources (Long et al. 2012). A third risk assessment form, the Priority Oral Health Risk Assessment Tool (PORRT), supported by an instructional video, was designed for statewide distribution. All of these risk assessment tools were paper. Now it is recommended that the assessment questions in the PORRT be incorporated into the template of each practice's EHR system.

### Integration Outcome Measures

#### *Overall Process Measures.*

Nearly 6,000 physicians, physician assistants, nurse practitioners, nurses and office staff have been trained in almost 800 official sessions since statewide implementation of the program in

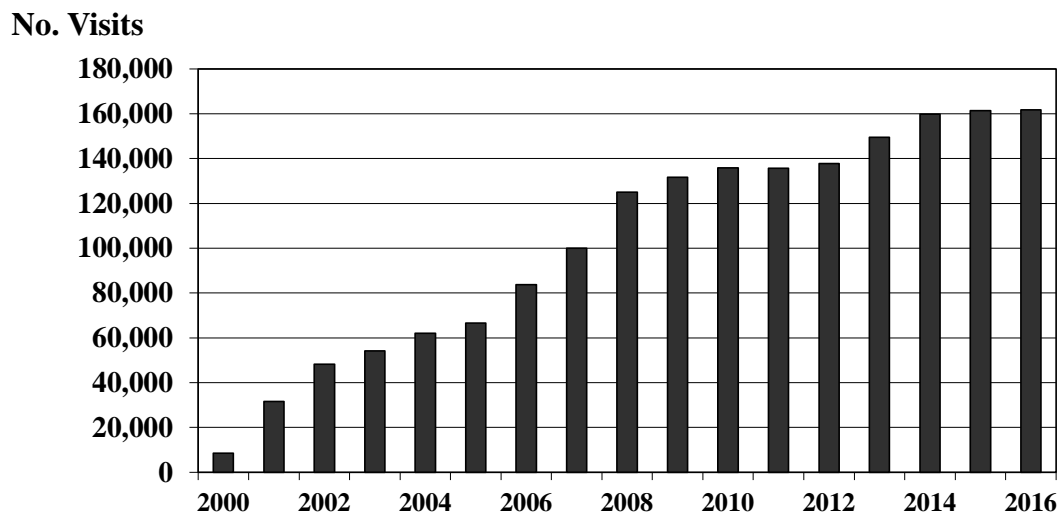


2001. Approximately 450 public and private billing providers (practices) are now providing POHS as part of the IMB program.

Performance measures for the entire enrolled Medicaid population 0-42 months of age include the number of visits in which POHS are provided by quarter and annually; payment amounts for POHS by quarter and annually; and the proportion of well-child visits with POHS. For medical practices that are part of the statewide CCNC network, performance measures include: the percent of patients with at least 4 fluoride varnish claims during the first 42 months of life; and the percent of patients aged 2 -21 years of age with at least one dental visit with a dental practitioner.

The utilization of preventive oral health services paid for by NC Medicaid has increased from approximately 8,500 IMB visits in 2000 to almost 162,000 in 2016 [See Figure 5.1]. Consistently, POHS are provided at about 50% of well-child visits statewide for 1- and 2-year-olds. CCNC reports that about 43% of Medicaid patients of their network providers enrolled for at least 10 months have 4 or more POHS visits during their first 42 months of life.

**Figure 5.1: Number of visits with preventive oral health services in NC medical offices, 2000-2016**



Source: NC Division of Medical Assistance.

*Results from Formal Evaluation Studies.*

A broad research agenda was undertaken because of the novelty of integrating POHS into primary care, a general lack of direct scientific evidence to inform hoped for integration outcomes, and the requests of policymakers, providers and others that they be provided with peer-reviewed results documenting the impact of services they provided. Published evaluation studies of the IMB initiative have addressed the following questions in more than two dozen peer-reviewed papers: (1) Will primary care providers provide preventive oral health services and what is the most effective strategy to train them? (2) What is the quality of POHS? (3) What is the pattern of visits in medical offices in which POHS are provided? (4) Does the IMB program increase access to POHS? (5) How do IMB POHS visits affect visits to the dental office; (6) Do IMB POHS reduce the need for dental treatment services? (7) Does the IMB program result in cost savings to Medicaid? (8) What is the comparative effectiveness of POHS provided in medical and dental offices? (9) What is the population impact of the IMB Program on oral health inequalities? and (10) How should professional oral health services provided in medical and dental offices be integrated with community programs like Early Head Start to achieve optimal oral health?

The following are some examples of the impact that IMB POHS have had on access, dental treatment, dental costs and dental caries status, summarized from a program briefing prepared for the North Carolina legislature (ECOHC, 2016):

- In about one-third of the state's counties, no Medicaid child in the targeted age group had received preventive dental care in dental offices before IMB. Six years later, children in all 100 counties of the state had received POHS in Medicaid. Access to preventive dental services for infants and toddlers increased by approximately 30-fold between launch of the program and 2006 (Rozier et al., 2010).
- CCNC reports that currently the annual dental visit rate for 2-3 year olds is 64%, nearly twice the national HEDIS mean (36%). These statistics represent improvements in the rate for early referral by primary care to dentists. The rates for school-aged children are similarly significantly higher than the national HEDIS mean, reflective of the emphasis of assuring a dental home for all children.
- Greater distance to obtaining care is not a barrier to preventive oral health visits in the medical office for young NC Medicaid-insured children as it is for dental office visits, (Kranz et al., 2014).
- On average, children with four or more IMB visits before three years of age show a 17.7% reduction in treatments for dental caries (Pahel et al., 2011).
- For children receiving four or more IMB visits before three years of age, there is a 21% reduction in hospitalizations for dental treatment (Pahel et al., 2011).

- IMB is cost effective if Medicaid pays \$2,331 to avoid a hospitalization for dental treatment and the related negative impacts on quality of life (Stearns et al., 2012). Average hospitalization costs in one study were \$3,223.
- Kindergarten students with four or more POHS visits averaged 1.82 decayed, missing and filled teeth (dmft), which was significantly less than students with 0 visits (2.21 dmft). The mean number of untreated decayed teeth was not reduced, however, for students with four or more POHS visits compared with those with 0 visits (Kranz et al., 2015).
- Public health surveillance suggests that IMB has contributed to a statewide decrease in the prevalence of dental caries in primary teeth since 2004 and helped reduce the gap in dental caries between children from low- and other-income families (Achembong et al., 2014).

These findings provide an indication of the integration of POHS into medical practice and their impact. Collectively they suggest that this type and degree of integration can reduce the need for dental treatment services, promote early entry into the dental care system for those children in greatest need, and help control costs. In 2013 North Carolina ranked third nationally in percent of Medicaid-insured children 0-5 years of age receiving oral preventive care from a medical or dental provider (Arthur & Rozier, 2016).

The beneficial effects of the IMB program have been achieved with a small investment in Medicaid expenditures for these services compared to the overall oral health budget. For example, expenditures for the IMB program in 2016 were approximately \$8 million out of total expenditures of about \$268 million for all children's oral health care in EPSDT and Health Choice (CHIP).

### Health Literacy and Integration

Low health literacy of families or health literacy practices of providers were not targeted explicitly in the IMB program, but principles of patient-centered counseling and related services for low literacy patients apply to all chronic conditions and were in clear display in the program. The integration model presented in this case study is “piggy-backing” onto an existing healthcare delivery system and thus largely depends on the already existing knowledge, skill and practices of the providers with the exception of oral health-specific content needed for delivery of POHS. Even here, many of the risk factors for child health are also risk factors for oral health.

A two-part question can be posed: “Have primary care providers delivering POHS received training in patient-centered communication, and do they routinely use these techniques?” CCNC corporate offices have trained more than 600 case managers and many of its affiliated practices in Motivational Interviewing and communication techniques (Graves & Watkins, 2015). According to Graves & Watkins (2015), “...CCNC continues to be at the forefront of a systems-

based motivational interviewing implementation movement in health care.” The number of medical providers delivering POHS who have participated in available national or state health literacy CME courses is unknown. So the answer to the first part of this question appears to be “yes”.

The evaluation team for the IMB program undertook two pilot studies to help answer the second part of the question about use of health literacy practices among medical providers delivering POHS. They assessed audio recordings of oral health communication between medical providers and parents during IMB visits for content and methods (Kranz et al, 2013; Decker et al., 2017). They found that medical providers use limited jargon and uncomplicated language; thus placing low health literacy demands on parents when counseling them about oral health issues. Other techniques known to be effective like the teach-back method were not used. Providers incorporated a wide variety of recommended oral health content into visits and integrated general health and oral health messages. Overall, these studies suggest that providers are delivering the content recommended by the AAP during IMB visit counseling, but not using some effective communication techniques.

Providers participating in CCNC are instructed to use only those patient materials approved by their health literacy committee. This committee has not reviewed any oral health materials. This requirement for review of oral health materials by a medical network reveals the attention to detail required for successful integration to happen. The Division of Medical Assistance has conducted mass mailings to all families about oral health, but does not have a committee that assesses them for plain language and cultural appropriateness.

#### Barriers and Facilitators during Implementation of the Integration Model

Barriers to integration at the start of the program were well documented (Close et al., 2010). Predominant among practice-level barriers were difficulty in applying the varnish, integration of dental procedures into the practice routine, resistance among staff and colleagues, and dentist referral difficulties. Some physicians were reluctant to participate in IMB because they feared discovering dental problems on screening and not having a dentist for referral. Barriers to practice-level adoption and implementation currently operating in the healthcare environment in the state are not known.

According to Dr. Mark Casey, Dental Officer for NC Medicaid, *“Reimbursement and equity issues are important—this has been an ongoing challenge for the initiative due to the differences in fees paid to dental and medical providers and the differences in allowed frequency of preventive oral health services between the two professions.”*

Kelly Close mentioned in her interview that initially there was some opposition from the dental profession. One editorial in the *Journal of the American Dental Association* captured this sentiment with the provocative title: “Look whose practicing dentistry” (Meskin, 2001). An ADA House of Delegates resolution was passed that “...it be policy of the American Dental Association that topical application of fluoride varnish is a part of comprehensive dental care which requires an examination and supervision by a licensed dentist” (ADA, 2001). This barrier is unlikely to be as prevalent now as it was when IMB started because of a national focus on oral health problems of young children and guidelines and other statements by many governmental, professional and philanthropic groups in support of integration of POHS into primary care.

Kern Eason with CCNC said that not having oral health elements in the electronic record is a barrier to the provision of POHS. Commercially available records have limited ability to capture information related to oral health. During the CHIPRA grant, however, several pediatric EHR systems were able to expand their capability in supporting documentation of oral health risk assessment and dental referrals. This work included adapting the PORRT into their systems, and expanding referral categories to include dentists.

A number of factors contributed to the early and continuing success of the IMB program. First, detailed information about the dental disease problem of young children in North Carolina was available and used effectively to document the problem. The initiative was framed as a primary prevention strategy to help reduce disease in very young children who had limited access to dentists. Prevention for dental disease was easily seen as a cost-effective part of pediatric primary care. The resulting well-defined problem supported an active partnership of individuals and organizations representing multiple pediatric health interests who were committed to the oral health and well-being of children and their families.

A second facilitating factor was the program’s commitment to a critical assessment of the scientific evidence to support the effectiveness of integration of POHS into primary care, and assurance that medical providers who were delivering these services understood that evidence and rationale. Scientific evidence of outcome impacts from delivery of POHS in medical offices was limited, so the general philosophy was adopted that an incremental strategy would be used for IMB in which development and testing would be done through pilot projects along with the promise that their outcomes would be rigorously evaluated and reported in the peer-reviewed literature.

Third, the intervention was designed to overcome barriers reported by primary care providers in North Carolina. An in-office CME course of less than 2 hours, enhanced with practice guidelines for the patient interventions, case-based problems, interactive sessions, practical strategies for implementation, a toolkit with resource materials, and follow-up were made

available to providers who wanted to participate in IMB. CME credit was provided and efforts continue to provide easily accessible CME for credit.

Finally, the IMB program and its evaluation have had adequate resources to test, implement, sustain and evaluate the model. Federal grant support was provided from: the Appalachian Regional Commission, Centers for Medicare and Medicaid Service (HCFA at the time), Health Resources and Services Administration, Centers for Disease Control and Prevention, and the National Institutes of Health. Federal dollars supplemented by state funds provide generous payment for services, which provide an incentive for participation in IMB. State agencies, professional societies and the University of North Carolina have provided in-kind contributions. A major factor contributing to the success of the initiative is having a project coordinator fully devoted to early childhood oral health issues, initially grant supported but then in a state-funded position.

#### RECOMMENDATIONS REGARDING INTEGRATION OF POHS INTO PRIMARY MEDICAL CARE

The participants in the interviews made a number of recommendations for this type of integration based on their experiences and observations with the different stages of IMB development, implementation and sustainability over a number of years. They acknowledged that some environmental circumstances might be state-specific or might have changed since IMB was initiated that could make some of these recommendations more or less important.

1. All participants emphasized the importance of having stakeholders actively involved from the beginning. IMB incorporated a diverse group of leaders from medicine and dentistry who were active at the beginning and continue to be involved and committed to resolving the oral health problems of young children in the state. Of particular importance are the North Carolina Pediatric Society and the North Carolina Academy of Family Physicians.
2. Successful integration of POHS into primary care depends on the continued participation of a dedicated core of individuals willing to devote time to see their efforts pay long-term benefits like increased access to care and improved oral health outcomes for Medicaid children.
3. It is important to frame the oral health problem appropriately. The IMB model was conceived as a response to a highly prevalent disease that was making children sick. Physicians agreed that they were positioned to help prevent children from getting sick from cavities and were willing to provide services because a sufficient number of dentists

were not available in their communities. POHS also fit within their scope of practice defined by well-child visits.

4. It is important to emphasize the science that supports the interventions in training courses and in the implementation support tools. Physicians are trained to rely on evidence-based guidelines and expect scientific support for the services they are being asked to provide.
5. Successful integration of POHS into primary care can be costly. Financial resources are important to the success of integration efforts. Of particular importance is adequate Medicaid reimbursement for all the POHS that primary care providers are being asked to incorporate into their practices. Fee schedules and allowed frequency of services should be equitable for medicine and dentistry to the extent possible.
6. Consider efforts to integrate POHS into primary care as a comprehensive set of interventions targeted to the multiple levels of integration rather than solely a Medicaid clinical benefit that pays physicians for a limited set of POHS like fluoride varnish. Such an approach might require grant funding. Without funding from a number of governmental sources, the IMB initiative would not have been as comprehensive or sustainable.
7. Evaluation studies for the IMB program have assessed a “package” of services including oral evaluation, counseling and fluoride varnish application. The effectiveness of individual components is not known. So it is important to consider strategies that result in the delivery of a comprehensive set of POHS rather than a single benefit such as fluoride varnish.
8. Hire a coordinator to not only launch the initiative, but to provide ongoing support, trouble-shooting, and public relations for the interest that will be generated for early childhood oral health. A full-time coordinator also can make individual office visits for training and monitoring.
9. A mechanism for monitoring the degree of integration of POHS into primary care is a key component of its success and should be built into the initiative. Kelly Close, who has coordinated the Medicaid program from the beginning, commented that if she had it to do over again, she would: *“Develop a system for following each IMB practice over time, using evidence-based criteria for assessing integration of clinical services into care.”*
10. Incremental enhancements to the clinical integration program should be considered based on performance metrics and formal evaluation studies.

## ADVANCING EARLY CHILDHOOD ORAL HEALTH IN NORTH CAROLINA

The IMB partnership has moved beyond the original blueprint for the program as it continues to consider methods to improve access and quality of oral health services for children in the state. Plans related to four major areas are being discussed or are being implemented by the IMB partnership.

The first set of activities is to help ensure that the appropriate number of eligible infants and toddlers receive POHS from primary care. The provision of POHS during well-child visits for Medicaid children 1-2 years of age statewide appears to have plateaued at around 50% of visits. According to CCNC, about 44% of their eligible patients have 4 or more visits before 3½ years of age. Understanding and improving visit rates for the state Medicaid population is a priority. Under-utilization of IMB services is a multilevel problem that will require multilevel interventions targeted at those enrolled children who do not adhere to the recommended well-child visit schedule, practices and providers who do not provide any POHS, and providers who have adopted but not fully implemented IMB. Reasons for non-adherence by patients and providers are not well understood and strategies to help inform interventions have been proposed.

A second area is the expansion of IMB benefits and integration models. Although politically difficult in today's environment, the hope is that current IMB benefits can be expanded to include older children, perhaps up to 5 or 6 years of age. The partnership continues to evaluate new technologies for their potential use in this type of integration model. For example, silver diamine fluoride is a NC Medicaid covered benefit for dental use. It might have potential use for primary and secondary prevention in primary care, but a demonstration project is needed to test this premise.

The NC Oral Health Section is leading an effort to expand the integration of oral health into primary care for perinatal populations. A statewide Perinatal Task Force on Oral Health has been formed, and a position created for a dental hygienist to oversee these integration efforts.

Third, work continues on trying to improve referral linkages between medical and dental providers. IMB strategies have progressed from statewide promotion of risk assessment and use of referral tools to implement risk-based referrals, to efforts designed to increase communication between the two provider types. Current training continues to promote risk-based referrals, but is trying to improve adherence, particularly for the large numbers of low-risk infants and toddlers who live in urban communities with an increasingly adequate supply of dentists where adherence to referral guidelines is known to be particularly low (~25%). Successful strategies will require intense work at the community-level in many areas of the state.



Finally, approaches to training medical providers in POHS continue to evolve. The Oral Health Section is moving away from in-office, face-to-face training and is currently developing e-modules for the AMA-approved course required by NC Medicaid for payment of services. The MOC IV training developed through the CHIPRA grant continues to be available, but the methods for conducting QI CME are evolving at the national level, and changes will need to be made locally to meet physicians' re-certification needs.

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## Case Study 2

### HealthPartners

#### *A History of Integration*

#### INTRODUCTION

HealthPartners is a nonprofit Accountable Care Organization that serves more than 1.2 million medical and 500,000 dental health plan members served by both owned and contracted providers in multiple states. HealthPartners long history of integration of dental health and primary care weighs their coverage and plan offerings through a filter of ‘Health, experience, and stewardship’. Examples of integration include dentists taking of blood pressure reading on all patients, pediatricians providing risk assessment and fluoride varnish for all young children, diabetes patients having periodontal services at waived fees, and a program for all pregnant women to be encouraged to seek prenatal dental care. HealthPartners has organization-wide guidelines about health literacy and examples of health literacy include a Patient Education department that reviews all patient-focused materials and a standing Patient Council that is organized to provide the perspective of members and patients.

#### CASE STUDY METHODS

This case study was selected because it met a number of our pre-specified criteria for inclusion: (1) established and ongoing program; (2) an organization system that offers a wide opportunity for implementation; (3) integration performance measures and multiple outcome measures; (4) an organization with a research arm that measures system performance and health outcomes; (5) challenges of handling a multi-state operation, including both rural and urban sites.

Sources of information gathered and analyzed:

1. Review of organization website, organization policies, guidelines, press releases and documents, and organization reports
2. Literature review and scan of Internet for items about this organization
3. Interviews by two of the case report authors with:  
David Gesko, DDS, Dental Director and Senior Vice President  
Charles Fazio, MD – Senior Vice President and Health Plan Medical Director  
Beth Averbeck, MD - Associate Medical Director for Primary Care.
4. Review and feedback of draft provided by HealthPartners for accuracy.

The information from our review of available documents and interview notes was analyzed and a report written and sent for feedback according to our case study guidelines.

## FINDINGS

### History of Organization: HealthPartner's history, philosophy and organization

HealthPartners is an Accountable Care Organization and the largest consumer governed nonprofit health care organization in the nation. It was established as a health maintenance organization that provides medical, dental, optometry and pharmacy health care services and health plan financing and administration. HealthPartners serves more than 1.2 million medical and approximately 500,000 dental health plan members nationwide. Although HP has 1.7 million patients, not all patients have both dental and medical insurance coverage through HealthPartners. During the 1970s more people were covered by both HealthPartners dental and medical insurance, but, according to Dr. Fazio, the insurance market buying preferences changed. The buyers shopping for health coverage are very price sensitive and dual dental-medical coverage is more expensive. Thus, the marketing department at HealthPartners says both insurance pieces must be priced competitively.

They employ around 1,700 physicians, 75 dentists in Minnesota and some in other nearby states (WI, ND, IA) and 500 dental staff spread over 24 dental clinics and 6 hospitals. HealthPartners also contracts with dentists through a PPO network to serve areas not covered by the HealthPartners' clinics.

HealthPartner's mission is to improve health and well-being in partnership with the members, patients and the community. (<https://www.healthpartners.com/hp/about/index.html>) The vision is: Health as it could be, affordability as it must be, through relationships built on trust.

### HealthPartner's philosophy for integration of oral health into primary care.

According to Dr. Gesko, "HealthPartners was a pioneering organization, with dental health incorporated as part of the company since the beginning, 60 years ago. Back then, integration was looked at differently, looked at as natural. They created a system with the mouth connected to the rest of the body as part of the core business model." Dr. Averbek concurred, saying that HealthPartners had a motto of "Coverage and Care" because it offered both the insurance plan plus the care system. The original incorporation documents established HealthPartners to provide medical and dental care, and the co-located dental and medical facilities emerged in 1975 when HealthPartners created their first dental clinics.

Applying this vision to integration, Dr. Gesko reports that the process of integration was calculated and thoughtful. Even before the Triple Aim was defined as a goal to improve the patient's health and experience of care at an affordable cost, the company weighed the coverage and offerings through a filter of 'Health, experience, and stewardship'.

### Integration of Oral Health and Primary Care

HealthPartners currently has integration in both directions, with pediatricians providing oral health preventive services, pharmacists advising on xerostomia, and dentists and dental hygienists conducting screening for the medical team. Although integration is of a long-standing nature at HealthPartners, they continue to see more possibilities for integration, ways integration can help with the Triple Aim, according to Drs. Gesko and Averbeck. The leadership group represents the various clinical departments within HealthPartners. The leadership group discusses all standing orders and protocols that are implemented at HealthPartners. This group meets regularly and ideas for expanded integration can be brought up and discussed there. The most recent integration topics arose at this standing meeting, antibiotic prophylaxis and the opioid crisis.

#### *Clinical and Professional integration.*

Clinically and professionally, there is much integration between medical and dental. According to Dr. Fazio, "the organization is designed to be collegial, collaborative and evidenced-based." HealthPartners develops guidelines for care, publishes the guidelines and updates them regularly. The Dental Group has published guidelines on dental caries, oral cancer, and third molars which can be found at the AHRQ National Guideline Clearinghouse ([https://www.guideline.gov/search?f\\_Guideline\\_Developer\\_String=HealthPartners%20Dental%20Group&fLockTerm=HealthPartners%2BDental%2BGroup](https://www.guideline.gov/search?f_Guideline_Developer_String=HealthPartners%20Dental%20Group&fLockTerm=HealthPartners%2BDental%2BGroup)).

Clinical practice guidelines can be found on their provider network website.

(<https://www.healthpartnersplans.com/providers/clinical-info/clinical-care-guidelines>)

Dentists take blood pressure (BP) on all patients, both new and recall. HealthPartners guidelines direct the dentists to refer patients with high HealthPartners readings right into the medical system for routine follow-up, or they walk them down the hall to the medical clinic if the BP reading is very high. Anecdotally, Dr. Gesko mentioned a patient whose cleaning was disrupted by a very high BP reading. The patient was ultimately diagnosed with cancer of kidneys, and thanked them for picking up the high reading. Dr. Averbeck agreed. She said the physicians have noticed an impact on hypertension since the dentists began routine testing.

On the medical side, the pediatrics' teams apply fluoride varnish (FV) to all children on a state public program, a proxy for risk. The FV program started with this approach many years ago

when the medical team decided to offer FV as part of the patient-centered care approach “to prevent downstream destruction of tooth structure”. Over 90% of children get FV. Medical compensation by the State for FV helps the bottom line, although it was not the determining factor.

The physicians and dentists have also agreed on a program to influence pregnant women to seek oral health as part of prenatal care, and more recently they tested a smoking cessation program offered by dental hygienists. Dr. Gesko was also one of the authors on a report about a feasibility study conducted at HealthPartners and elsewhere on random blood glucose testing in a dental practice. This was a study conducted by the federally sponsored Dental Practice Based Research Network (JADA.ada.org March 2012).

#### *Organizational Integration.*

Organization integration involves the agreements and alliances developed to create strong collaborative accountability needed to deliver patient-focused comprehensive care.

HealthPartners recognizes the potential advantages toward the Triple Aim of integrated systems. About 500,000 people are covered by HealthPartners dental insurance, of which about 375,000 are served by contract dentists in the PPO network, and 125,000 actively use the HealthPartners’ owned dental clinics where almost all of these people also have HealthPartners medical coverage. Where the patient has both plan coverage and service at a HealthPartners facility, the doctors can take advantage of clinical, and functional integration of the integrated health record, and financial integration for those individuals. But it is not the same for those who have only HealthPartners Medical plan coverage. There, HealthPartners has had to develop relationships with CIGNA, Delta Dental, and others so they can cover large Minnesota-based companies (like Anderson Windows, Best Buy). Unlike the medical plan, the dental plan doesn’t have a large national network base across the U.S.

HealthPartners also builds strategic alliances with outside groups, such as Medicaid, which accounts for 25-30% of its members in Minnesota, and with employer groups, through the managed care contracts to provide comprehensive, integrated care at lower cost. HealthPartners’ clinicians trust the data that properly managing diabetic patients’ care helps to control costs. Thus, according to Dr. Gesko, in their partnership meetings with the state or employer groups, HealthPartners offers to partner with them for services for diabetes patients- the spending will go up on dental costs, but research shows that more expensive medical care for hospitalization, emergency room visits, and eye disorders will go down in greater amounts than they will spend on the dental services. HealthPartners then allocates the payment received from the State between the medical and dental units to cover all the services required. This is an example of how HealthPartners operates to assure the Triple Aim - better care at lower cost.

### *Systemic Integration.*

Systemic integration involves stakeholder management, including both formal and informal arrangements needed for the clinicians to deliver a comprehensive continuum of care. Over their 60 years in Minnesota, HealthPartners has become well-invested in the community to understand what they can do outside the actual clinical care machine to deliver better care. Their website offers their perspective on how Systemic Integration works: “HealthPartners is driving change that helps our members live healthier lives and lower costs. Through our unique wellness programs, advocacy efforts and innovative payment approaches which incent and reward quality, we are able to provide better value for our customers. By partnering with providers, members, purchasers, and the community, we are leveraging our plan capabilities to develop initiatives which improve health, member experience and affordability.”

According to Dr. Fazio, HealthPartners spends time developing materials and working with community groups to understand what HealthPartners might do differently to adapt to the needs of the population. They believe strongly that social determinants of health are influential and work in a variety of partnerships with the community. For example, HealthPartners helped to redesign food shelves in the community so healthy foods are more prominently displayed. They worked with the city of St. Paul and local Catholic charities to arrange for temporary housing so that people who are homeless are not discharged from the hospital back into the streets. It can start as a small group of people who focus on these projects, but others in the organization can be pulled into an activity. Another example was partnering with Wilder Charitable Foundation in St. Paul, to address the areas where grocery stores were lacking – a food desert. Through the partnerships, they took a city bus and outfitted it as a traveling grocery store, stocked with healthy food. HealthPartners also offers a number of ‘rewards and perks’ to Medicaid patients to encourage them to build strong positive health behaviors. For joining and participating in programs for fitness, pregnancy, car seat safety, child and teen immunizations, asthma management, family health coaching, and preventive dentistry, gift cards and potentially other gifts are available. (<https://www.healthpartners.com/hp/insurance/mn-public-programs/health-incentives/index.html>)

A Patient Council is part of the structure of HealthPartners in order “to understand the perspective of our members and patients. In addition to surveys, focus groups and our online panel, the Patient Council provides a regular opportunity to hear from our members.” The Council includes people with HealthPartners insurance, willing to attend 10 evening meetings per year to give their feedback. They receive \$50 per meeting plus dinner.

(<https://www.healthpartners.com/hp/about/patient-council/index.html>)

### *Functional Integration.*

Discrete functions and activities add value by supporting the health care delivery service. Dr. Gesko judges the support structure at HealthPartners as ‘great’, enabling clinicians to be clinicians. There is a team of nonclinicians that supports the practice by handling all compliance



with regulations, etc. Organizationally, the Patient Educators help make sure that patient-focused materials, such as diabetes health education information, includes both medical and dental information in low reading level and in multiple languages. (See Health Literacy for more)

HealthPartners has been working to bring the clinical units physically closer together. Ninety percent of the dental clinics are now on full-service campuses – with medical, optical, and pharmacy. According to Dr. Gesko, the company markets the ability to have all services together - park once and see all their providers. This is a big selling point. Records, too are available for all dental patients, but they have not been integrated up to this time. HealthPartners is in the process of pulling all of the clinics into a new integrated health record under Epic. By October 2017, all care in the HealthPartners' owned facilities, including clinics and hospitals will use a fully integrated record system. They anticipate the new Epic system will significantly help improve clinical care.

Both Dr. Fazio and Gesko commented on how the organization's integration helps the professionals and their clinical care mission. They think it would be better if people got both their medical and dental care from HealthPartners, rather than going elsewhere for some part of their care. They believe the clinician has to work harder in order to provide the same level of high quality care for patients not covered by the integrated health record. With disparate systems, some connections can be made because HealthPartners dental has been using diagnostic codes for 15 years. However, it will be so much easier to identify people with chronic conditions with a common, integrated health record, such that diabetic patients can be identified and referrals take place in each direction. HealthPartners has had a program for diabetic patients for about nine years, where HealthPartners waives all costs (co-payments and annual maximums for periodontal services) in order to provide regular periodontal services for these patients. They use their claims data, to look at the population. For diabetic patients, whether the patient is in the dental clinic or served by a contracted dentist, if the patient hasn't had a claim for dental services, HealthPartners reaches out to them through the nurse navigators to educate the patients about the importance of oral health and advises the patient to go to their dentist. However, if the patient doesn't also have dental insurance, HealthPartners can't offer the benefit of free periodontal services! The ability to provide programs that improve care and improve the bottom line is one of the successes HP sees with integrated care and administration.

The HealthPartners Institute for Education and Research acts as a learning organization to help support the clinical care mission. Recently, they developed a study to see if a Dental Care voucher given to Medicaid or uninsured individuals who go to the emergency department (ED) for a non-urgent dental complaint could induce them to go to a primary dental care visit and reduce follow-up ED visits. They found it did help to reduce return ED visits.

<https://www.healthpartners.com/hp/about/press-releases/12-02-15b.html>

*Normative Integration.*

The ability to create a shared value system is the result of visionary leadership and a collective attitude and HealthPartners has clearly built a culture describing their interest in unity and leadership. Dr. Fazio explains there is an aspirational culture for HealthPartners' clinicians that is provided to people who will be joining HealthPartners, what the partner can expect, and HealthPartners' expectations of them. This living document was recently revised after input from all clinicians. So, the health professionals all have a shared understanding of how the clinical system works. In addition to the document, mentoring is offered to each new dental group practice member, and a document given to them about the philosophy of the group, both as a clinician and a leader:

**THE DOCTORS AND CLINICIANS WE WANT TO BE**

Joy and passion are fundamental to our work.  
Being at our best requires balance in our personal and professional lives.  
Clinical excellence and great care is grounded in the right training, appropriate staffing, market-based compensation, and strong organizational support.  
Each of us is a leader and shares responsibility for creating our culture.

**THE RELATIONSHIPS WE SEEK TO STRENGTHEN**

Every colleague and patient is part of the team.  
We are stronger together.  
Time together as colleagues makes for a stronger group.  
We see clinicians and administrators as true partners, and we value multiple voices when making decisions.

When asked about whether HealthPartners provides continuing education about integration itself, we were told that they did not.

Dr. Gesko thinks that HealthPartners is proud that Minnesota is the first state to embrace dental therapists (DT) for all of its population, and not simply public health programs, and HealthPartners has been an early adopter. HealthPartners hired its first DT in 2012 and the use of DT integration comes back to the Triple Aim, offering excellent care, a good experience, at an affordable cost. For the State's Medicaid population, HealthPartners knows they won't get the same level of reimbursement that HealthPartners charges for commercial patients. But, HealthPartners is committed to serving the Minnesota population, and does so by offering a better delivery model at more cost-effective rate because the clinicians work at the top of their license capabilities. While they only have 3-4 DTs so far, it is quickly becoming the cultural norm, when dentists retire or move, to consider whether they need to replace the full FTE of that person with a dentist or a DT. DTs can do many services at lower cost, thus, it will be a growing part of the practice.

Minnesota allows DT only to assess, not to diagnose. The Board of Dentistry allows DT to use the 120 and 140 CDT codes – limited oral evaluation, periodic oral evaluation. However, the DTs can provide palliative pain removal. Thus, if the patient has a toothache, caries in pulp, periapical pathology, the DT can deal with pain issues and refer to dentist. This can provide a creative advantage to serve patients – and keep the patient out of the ED. Not all dentists are excited about DT as Dr. Gesko is.

### Performance measures

HealthPartners performance measures align with the goals of the Triple Aim and their philosophy and process are available for the professionals and public on their website, ‘Understanding cost and quality’. <https://www.healthpartners.com/hp/about/understanding-cost-and-quality/index.html>. HealthPartners uses the validated Picker Patient Experience Questionnaire to measure patient satisfaction with their health care experience. These quality improvement items seek information regarding whether the patient gets information from their doctor that they could understand and whether the patient is encouraged to be part of the decision-making regarding their care. In assessing whether HealthPartners is improving clinical items regarding patient health they measure whether they have built capability, for example, to assess the percent of diabetic patients getting periodontal therapy.

Recently, HealthPartners leadership participated in a recent CDC publication talking about the need for and development of broader measures of population health and wellness, including the social determinants of health. (<https://www.healthpartners.com/hp/about/press-releases/04-15-16.html>) According to Dr. Averbek, the physicians consider the social determinants of health to be useful for working with the community. For example, for a recent program for recently discharged patients, in addition to nurse home visits, patients were offered a home visit by the local firefighters to check their fire alarms and safety. Elderly people were happy to have the safety check and the firefighters found a reduction in 911 calls.

Given the emphasis on measurement, one might wonder how clinicians feel when they join HealthPartners. The use of evidence-based guidelines underpins the HealthPartners’ care agenda. Use of the guidelines is “expected of clinicians”. Annual performance evaluations adhere to that principle. HealthPartners pulls data from the electronic dental record (EDR) or EHR for physicians. They also evaluate the clinician’s patient communication, responsiveness, flexibility, respectful workplace attitudes and behaviors, and positive participation in work-related events.

Aggregate information about performance is returned to the entire care team – assistants through regional managers. Some examples are the system-wide risk assessment for caries, periodontal disease and oral cancer – this is a team responsibility – handled by the dental hygienist and the dentist. Patient satisfaction is another performance measure. Not only the patient response to

questionnaires, HealthPartners' compliance group also offers a shadowing program by nonclinician-trained observers to see how the clinicians respond to the patients.

When asked what physicians and dentists felt about the HealthPartners benefit for not charging a co-pay for periodontal treatment in diabetes patients, Dr. Gesko stated that the clinicians believe the studies, believe significant savings can be had. In an integrated system of finance and delivery of care, anything that decreases claims payment, while still providing high quality care is HealthPartners' business model. Dr. Gesko said, "We are not a for-profit company, but still need to be financially viable. We have to be very efficient. Fluctuations occur from year to year, utilization can be down some years, but in a "diversified portfolio" one balances delivery and finance. Utilization balances the claims payments." Dr. Averbek explained that physicians believe that any way one can reduce the barriers to patients getting the care they need, it is a winning program.

### Health Literacy

There are many indications that HealthPartners recognizes the importance and value of Health literacy. They are one of 43 local health care organizations participating in Minnesota's "Health Literacy partnership to improve health literacy" and HealthPartners has created an organizational-level guideline to this effect.

[https://www.healthpartners.com/ucm/groups/public/@hp/@public/documents/documents/entry\\_184562.pdf](https://www.healthpartners.com/ucm/groups/public/@hp/@public/documents/documents/entry_184562.pdf)

At HealthPartners, health literacy is operationalized under six priority areas:

1. Adopt and use health literacy best practices
2. Make information about health useful and accessible
3. Increase and improve patient-centered resources
4. Provide opportunities for health literacy education at all levels
5. Streamline processes to make it easier for patients to navigate the health care system
6. Invest in resources to ensure that health information is culturally appropriate and in a patient's preferred language. (<https://www.healthpartners.com/hp/about/press-releases/05-04-16.html>)

HealthPartners has adopted health-literacy best-practice steps for the entire operation: First, it created a home for the health literacy program called the Patient Education Department that is responsible for overseeing all health literacy initiatives at HealthPartners. It is supported by the executive leadership. Second, its guidelines provide training on clear health communication for all staff who interact with patients/members in person or over the telephone or who create written communications for members. Third, it incorporates other aspects of clear health communication, and graphic design elements to promote readability.

All HealthPartners' patient literature, websites or in-office consent forms and post-operative instructions are run through the health literacy guidelines by the Patient Education group. Any unique document that clinicians give to a patient or direct them to, has to comply with guidelines and be available at a 5<sup>th</sup> or 6<sup>th</sup> grade reading level, and in multiple languages. HealthPartners also gets feedback from the standing Patient Council who meet monthly, and from the online community on certain new education materials to see if the right message comes across. The leadership group also tends to identify clinician needs for patient education materials

Verbal communication is also important. HealthPartners' clinicians talk openly about the importance of using nonclinical jargon. They discuss communication in their mentoring activities. In addition, patient satisfaction questions ask about HL, 'did you understand the dentist that you saw?' (Consumer Assessment of Healthcare Providers and Systems) Comments are returned to the dentists.

Dr. Fazio commented, "the HealthPartners dentists are good at taking care of the community. It's who we are. The HealthPartners dental team is one of the few routinely open to accepting patients with Medicaid."

Regarding health literacy and integration, Dr. Gesko believes that health literacy helps the organization to explain to members the rationale for having an integrated organization, so that all patients realize why dentistry and medicine need to work together.

#### Barriers/Facilitators during the implementation of integration

HealthPartners started integrating before others had recognized the problems created by silos between medicine and dentistry. That did not mean that everything at HealthPartners went smoothly. Dr. Fazio explained that Dr. Gesko is constantly waving the flag – "Remember oral health". Physicians know about the pilot integration programs and those programs that have been implemented. Pharmacists now tell patients about xerostomic effects of medications on oral health. They remind people that they need to connect with their dentists so potential problems can be mitigated through fluoride rinses and more frequent recall. But, it is their impression that people do still forget about the mouth.

For example, when the topic of developing a protocol for the opioid prescribing began, a task force was selected, comprised of medical specialists. They began to look at the evidence. And during the review of published literature and review of charts of who prescribed opioids, the task force realized young people were receiving opioids and they were prescribed by the dentists. Then, dentistry was added to the task force.

But barriers to integration don't necessarily impact only dentistry. When the leadership group began to work on a protocol for prophylactic antibiotics, the challenges came from physicians of different disciplines who had diverse opinions regarding the best protocol to implement. Thus, regardless of the discipline, one needs to build personal relationships before integrating.

#### Recommendations regarding integration of oral health and general health

Dr. Averbeck noted that the emphasis for successful integration relies on the leadership team. Make sure leadership is on board; build your team and test it on something small. Once you have it worked out, then spread it! "But, the leadership team must know and trust each other. One can't rely on tools alone. You have to have the people on board first; then develop the workflow process; finally develop the supporting tools." She also observed that the leadership must do what is required to build the relationships. In some cases, co-location may help, because it brings people together.

Dr. Fazio advised that clinicians, "get up to speed on the evidence between oral health and general physical health, then look for more opportunities. Eventually, this will become as connected as behavioral and physical health – part of health and well-being."

Dr. Gesko recommended that dentists, "Be All In! Be a cheerleader for (integration); work hard to reduce the profession's silos. So, MDs don't look past the teeth to the tonsils, and dentists routinely check BP." We need to comprehensively take care of our patients.

#### Future plans

Obviously, Epic's integrated system will offer countless opportunities for integration. HealthPartners anticipates working on the well-baby check-up as a natural to build on. They participate on a variation of the 'Reach Out and Read' program of giving books to families, and they can market the technique to go to the dentist at the appearance of the first tooth.

Dr. Fazio commented that Medical and Dental insurance are separate offerings, and are separate functions, so, once they have Epic they can start to assess the question of whether integration of dental health and primary care actually reduces overall patient cost.

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## CASE STUDY 3

Grace Health

### *Maternal Infant Oral Health Program*

## INTRODUCTION

Grace Health (GH) is a federally qualified health center (FQHC) in Michigan that has developed a novel approach, the Maternal Infant Oral Health (MIOH) Program, to improve access to dental care for pregnant women by integrating dental hygienists into their prenatal care team. The pregnant women meet with the DHs during their obstetrics (OB) visits in the OB/GYN suite, without needing to schedule a separate appointment. The dental hygienists have also been integrated into the CenteringPregnancy group model of prenatal care and to a lesser extent, into the Pediatrics Department to provide preventive dental services for infants and toddlers. This case study describes this MIOH program.

## CASE STUDY METHODS

We selected this case study for several reasons. It is an innovative example of integration within an FQHC, the program is established and ongoing, it has and tracks performance measures, and the Michigan Department of Health and Human Services in partnership with the University of Detroit Mercy School of Dentistry have plans for expanding the model in Michigan.

Data collection included:

1. Review of the health center website, PowerPoint presentation about the program, and final report to the initial funding agency.
2. Discussion with Emily Norrix, MPH, Perinatal Oral Health Consultant, Michigan Department of Health and Human Services.
3. Interviews by two of the case report authors (JAW, KAA) with GH staff:  
Kevin Steely, DDS, Clinical Academic Advisor and Supervising Dentist for PA—161,  
Alisha Morris, Director of Core Services, Family Practice and Internal Medicine  
Staci Hard, RDH and Jessica Southerland, RDH, BSDH  
Heather Foulke, CNM, WHNP-BC, Nurse Midwife  
Jill Wise, Vice President and Chief Operating Officer of Specialty Services and former OB/GYN Director
4. Discussion with Divesh Byrappagari, BDS, MSD Assistant Professor, Director, Division of Dental Public Health and Outreach, University of Detroit Mercy School of Dentistry.
5. Review of draft by Grace Health for accuracy.



## FINDINGS

### History of the Organization and Background Information

GH is an FQHC, located in Battle Creek Michigan, home of W. K. Kellogg who accidentally invented corn flakes, and is often referred to as the “Cereal City.” The health center opened in 1986 as the North Avenue Women’s Center, so women’s services have always been an integral part of its mission. It has grown and added many additional services over the years. GH has received Patient-Centered Medical Home, Level 3 Recognition from the National Committee for Quality Assurance (NCQA). Its mission statement is:

“At Grace Health, we provide quality health care with the belief that all individuals have the right to considerate service at all times with recognition of their personal dignity.”

The health center is the largest non-profit health center located in Calhoun County, which has a large low-income, Medicaid population. In 2016, 62.4% of the patient population at Grace Health was Medicaid insured, 8.4% enrolled in Medicare, 12.3% had commercial insurance and 7.9% were uninsured. The Health Center cared for 31,731 patients during 133,927 patient encounters in 2016. The population seeking care exploded when Michigan expanded Medicaid. GH is one of the only locations in the county for adults enrolled in Medicaid to get dental services.

When the dental department opened in 1996, volunteer dentists first staffed it. It has now grown to two sites (the other site is in Albion, MI), with a combined total of 27 operatories, 8 full-time and 4 part-time dentists, and 45 staff. The OB/GYN department has 23 staff members that include RNs, MAs, Ultra-sonographer, Receptionists, Scheduling Coordinator, Care Team Clerks, an Advocate, a Community Outreach Coordinator and Director with 7 Certified Nurse Midwives and 4 OB/GYN Physicians in the office on a rotating basis. There are 19 exam rooms. In 2016, the department had 18,244 patient encounters, served 856 pregnant women and performed 543 deliveries.

### GH’s Motivation and Philosophy for Integration of Oral Health into Primary Care

PA-161, that permits dental hygienists to provide preventive services under indirect supervision, is a critical factor that facilitated the implementation of nontraditional dental care settings in Michigan. (See details under system integration.)

Beginning in 2006, GH started a school-based dental program. GH dental hygienists and support staff went to public and some private schools in Calhoun County with portable equipment to

provide to children, with their parental consent, dental screenings, dental prophylaxes (prophy), fluoride varnish applications, and dental sealants where indicated, and to refer the children with urgent needs to the GH dental clinic or help them find a dental home. This program has expanded to see 3,000 children/year. GH funds this community service internally, and the 11 dental hygienists from the dental department rotate through the program. Parents can opt in or out. What is unusual is that the program is open to all schoolchildren regardless of type of or lack of insurance status, and is free of charge. GH's goal is to intercede early to promote good oral health for the community. They aim to increase access to preventive care rather than only treating disease in the clinic and "putting out fires."

When a new, expanded OB/GYN facility was built, the Chief Operating Officer (COO) Tera Wilson, who had her start as a dental hygienist, conceived of the idea to have dental hygienists integrated into the department to see pregnant women when they come for OB care. Since the first "port-of-call" and most frequent point of access to prenatal care for pregnant women is in the OB clinic, her idea was to make it an access point for prenatal dental care also. Implementation of this concept would help eliminate a barrier to professional oral healthcare for women at a critical life stage.

The main selling point and primary motivation for integration of oral health was the need for dental care. There was an awareness that many people in the community suffer from oral disease. According to Ms. Foulke, at the time, some of the local dentists were not willing to treat pregnant women or only provided prophys but not extractions or other treatment to alleviate pain. The dental program limits care to low-income patients from Calhoun County enrolled in Medicaid or eligible for the FQHC's sliding-fee-scale because of high demand. The OB/GYN and midwives could see the profound need when the women smiled.

The current COO Jill Wise was the Director, OB/GYN Operations at the time. She thought the oral health initiative was a great fit for OB/GYN because it could have an impact on the pregnant women's oral health, address any infection in women's mouths, possibly affect their birth outcomes, and possibly improve the oral health of their infants and older children. It was a great fit with GH's mission of providing comprehensive care. She said, "Pregnancy is a great time to provide health education because women are more open to changing habits."

The pre-term, low birth weight and infant mortality rates for Calhoun County had been worse than the rates for the state of Michigan and the national average for many years. GH had started a community initiative, creating a pregnancy care workgroup of all local non-profits agencies and health and human service organizations and other groups that serve women, infants or families with the goal to improve pregnancy outcomes and infant health. They wanted all pregnant women in Calhoun County to get the same messages, health education and access to resources based on eligibility. The MIOH program fit in with this initiative.

An opportunity arose to apply for a grant from the Blue Cross and Blue Shield (BCBS) of Michigan Social Mission Department. Dr. Steely wrote the successful grant with encouragement from the COO. The \$50,000 grant from BCBS provided start-up funds to implement the project. A room in the expanded OB/GYN clinic was modified into a dedicated dental operator, a dental chair and unit was purchased and installed, and supplies and instruments acquired. Initially the grant paid part of the DHs' salary. GH subsequently continued their salary after the grant ended. In 2005, the state legislature passed Public Act (PA) -161, the Public Dental Prevention Program. The program permits dental hygienists to provide preventive services under indirect supervision. GH obtained PA-161 certification from the State of Michigan for designated GH dental hygienists to work in the OB/GYN facility under indirect supervision of GH dentists. In November 2014, DH began seeing patients in the OB/GYN department.

### Integration of Oral Health and Primary Care: MIOH Program Components

The primary goal is to educate patients about the importance of oral health and increase low-income women's access to dental care. The program is designed for the dental hygienist to meet with each woman three times during her pregnancy and once postpartum. According to Ms. Hard, the dental hygienists did not have a model to follow, so they designed their own program to provide the education the women needed to make healthy choices in a preventive way.

At first, there was some confusion from the women as to why they were going to see the dental hygienist. Staff explained that it was part of their prenatal care at no additional charge because GH wanted the best dental health for the women and children. The following components of the MIOH program are incorporated into the women's scheduled OB visits.

#### *Pre-registration visit.*

All pregnant women have a pre-registration appointment with a nurse who explains the prenatal visit process and includes information about the dental program. The nurse obtains a comprehensive medical history. The women get a "safe" packet with information about safe medications, and lots of information. This "pre-reg" visit generally takes two hours. Occasionally the woman sees the dental hygienist on the same day, especially if she has any dental pain, but usually the women are tired and ready to go home.

Each visit with the dental hygienist usually takes about 15 minutes, but can be longer if needed. The dental hygienist provides many patient educational materials at each visit with relevant information. All the handouts are developed to be not more than a 6<sup>th</sup> grade reading level. (See Health Literacy section) The following activities occur at each of the MIOH program dental hygienist visits.

*First trimester visit.*

This dental visit occurs around 10-12 weeks, in conjunction with a visit to the OB provider. The dental hygienist talks to the woman about the oral health program and the multiple visits during her pregnancy. The focus of the first trimester visit is on her. The dental hygienist provides a dental screening, assesses treatment urgency, and acts as the patient's advocate. She talks to the patient about how healthy the teeth and gums look in their mouth. She inquires about their home care habits, tobacco use, last dental visit, dental symptoms and prior dental experiences. The importance of oral care during pregnancy is emphasized. If relevant and there is time, information about how infection in the mouth could spread to the body is discussed. Some women are already existing patients that are current with their care. Others have not had dental care in years, and urgent needs based on infection and/or broken teeth are given highest priority. The dental hygienist tries to break through whatever barriers have existed for the women to help them get dental care. For some women without urgent needs, a prophylaxis can be performed if needed at any of the visits. When patients are seen for the first time, for those with coverage, Medicaid is billed for an oral assessment. Education is not a billable service.

If the patient is enrolled in Medicaid, the dental hygienist can schedule an appointment for her in the dental department. If the patient has commercial dental insurance, she tries to provide the names of local dentists who will see pregnant women so a dental visit can be scheduled. If resources are a concern, they explain about the local community college that has a dental hygiene education program that provides inexpensive prophylaxes. Low-income women not on Medicaid may qualify for the FQHC's sliding fee scale. Dental phobia is common. If deemed helpful, the dental hygienist can accompany the woman to her GH dental appointment to ease the transition, make her more comfortable, take the radiographs, and conduct a more comprehensive exam.

*Second trimester visit.*

This dental visit occurs around 24 to 28 weeks. The dental hygienist sees the woman in the OB exam room, either before or after her OB appointment, depending on timing and scheduling. The dental hygienist inquires about whether the woman had a dental visit since their first OB visit and what happened. Dental needs and treatment plan are discussed and dental appointments are scheduled accordingly. If referral to a specialist is needed, the dental hygienist will assist. Oral hygiene and diet during pregnancy are discussed and how they affect oral health. During this visit, a focus on the oral health of other children in the family is added. If applicable, the hygienists ask if the children have been to the dentist and talk about child nutrition. They may provide dental screenings and prophylaxes for the children and refer them to the dental department if they do not have a dental home.

*Third trimester visit.*

This dental visit occurs around 32 weeks, again in the OB exam room. This time they talk about the baby and infant oral care. Topics are discussed such as when and how to brush the baby's

gums and the teeth, healthy food and drink for the baby, and limiting sugary liquids and juice (in spite of lots of juice provided by the WIC program.) They encourage breast milk, eventual use of a sippy cup, and the importance of the age 1 dental visit coordinated with a well-child check. They also stress the importance of the mother getting her own dental care to avoid transmitting germs from her mouth to the baby. They assess her oral health status and schedule dental visits if needed.

*Post-partum visit.*

This visit occurs within 56 days of delivery. They thank the mothers for being in the program. They ask them how they are doing, and if they are taking care of their own needs as well as the baby's needs. They give the mother several gifts including the "Drool to School" book from Delta Dental to take home as a reference with lots of dental information, a finger brush to brush the baby's gums, and a toothbrush. They are reminded about the age 1 dental visit for their child.

*CenteringPregnancy.*

CenteringPregnancy (CP) is a group model of prenatal care. In addition to individually seeing their OB provider, group sessions are scheduled for 10-13 women with similar due dates for receiving and sharing information and peer support. Close relationships often develop among the women in the group. The dental hygienists see the women in a different format than the regular MIOH program. During the first of these half-day CP sessions, and sometimes earlier, the dental hygienists provide dental screenings and counseling to the women in the CP groups, similar to the first trimester appointment and make appointments for them with the dental clinic. However, because of logistical issues, the screenings are done in the CP group area using a headlamp instead of the dental hygienist operatory. The second group session is dedicated to oral health and the dental hygienists provide information to them during this two-hour session. They make the session enjoyable and facilitate questions and discussion. Other CP facilitators and group leaders learn about oral health and the MIOH program during this process, and become good at directing patients to the dental hygienists if needed. The dental hygienists try to provide the third trimester education appointment with them during an OB visit towards the end of their pregnancy. The CP program began in June 2015, after the MIOH program had already started and the dental hygienists were on board, so it was easy to include oral health from the beginning.

*Age 1 and other pediatric dental visits.*

Although less formalized, when a child between 9 – 12 months of age is seen in the GH Pediatric Department, the staff will contact the dental hygienist for the baby's first dental visit and for other dental visits up to age three. The Pediatrics Department is in the next building from OB/GYN, about a three-minute walk, though also connected by underground tunnel. The dental hygienist will see the child in the pediatric exam room, conduct a dental screening, caries risk

assessment and apply fluoride varnish every six months. Appointments are made for children with dental needs if they do not have a dental home or referred for dental care if they have commercial dental insurance. The OB/GYN and Pediatrics Departments accept commercial insurance. To provide payment for fluoride varnish, some of the commercial insurance companies require that a medical provider apply it if performed in a medical facility, which excludes the dental hygienists as providers. Thus, the dental hygienists have been training the medical assistants how to apply fluoride varnish using a tell-show-do approach. The medical providers complete the “Smiles for Life” online training modules, watch the dental hygienists provide fluoride varnish to the Medicaid-enrolled children, and then the dental hygienists watch the medical assistants apply fluoride varnish and provide feedback. This is a new aspect of the program and another example of professional integration. The medical assistants have been very receptive. One of the benefits of the MIOH program spilling into pediatrics is that the dental hygienists now increasingly see the women who they got to know when pregnant with their young children. When a mom says, “I remember when you told me not to give the baby juice,” it is positive feedback for the dental hygienists.

### Types of Integration

#### *Clinical and professional integration.*

The GH administration, dental and OB/GYN professionals decided to collaborate on the oral health integration program, with dental hygienists bringing expertise and becoming part of the OB/GYN medical team. There is a lot of one to one education between the dental hygienist and OB providers about oral health. The dental hygienists serve as a great point of contact for the OB providers when there are dental questions. The OB providers have been asked to take the Smiles for Life curriculum to become familiar with oral health, but it has not happened yet.

The dental hygienists participate in CenteringPregnancy. The dental hygienists are also integrated into the pediatrics program where they see children for their age 1 dental visit during the child’s pediatric well-child appointment. Although some appointments are scheduled, the dental hygienists to some extent are “on call” to go to Pediatrics when there is an eligible child for dental services and Pediatrics calls them.

#### *Organizational integration.*

GH administration provided the physical space outside the dental department, co-located in the OB/GYN wing for the MIOH program. The space was equipped as a dental operatory with a dental chair for the dental screening visit during the first trimester. However, integration beyond physical co-location is a key feature of this MIOH program. The patient’s second and third trimester visits with the dental hygienist usually occur in the OB exam room. The dental hygienists also see women in other areas of the health center along with the OB/GYN and pediatric providers.

The GH administration encouraged Dr. Steely to submit the application for grant support to get equipment and supplies to start the program, and have continued it with salary support for the dental hygienists. In house facility and IT support staff were available to develop the physical and electronic infrastructure. Hiring the two passionate, outgoing and visionary dental hygienists who were willing to engage with non-dental providers, build relationships with other health center staff and continue to seek ways to improve the process was instrumental in making organizational integration successful.

GH is partnering with many community organizations to improve pregnancy outcomes and infant health. The OB/GYN department has also integrated behavioral health, so if a woman reports anxiety or does not feel safe at home, services are available. As part of comprehensive care, GH connects health and social needs of patients. There is an OB advocate who meets with every Mom while she is in the hospital to ask how things are going, if they have food, housing or safety issues when they are discharged, to identify risks and get the women connected to services. Social workers may be sent to their homes to provide education and advocacy throughout pregnancy and infant's first year.

#### *System integration.*

Several system factors have facilitated the development and implementation of this program. The deployment of PA 161 is a necessary component of this program for the dental hygienists to work away from the dental clinic. From the Michigan Department of Health and Human Services website:

“This program allows a collaborative practice between dental hygienists and dentists to allow preventive oral health services on unassigned and underserved populations in the state of Michigan. Through approved applications, nonprofit agencies can use dental hygienist service providers to administer preventive services to those in the state most in need of oral health care.”

Most low-income pregnant women seen qualify for Medicaid. GH can bill Medicaid for the oral assessments and prophys provided by the dental hygienists, though not for education. They hope to turn the pregnant women into dental patients and have GH be their dental home. Qualified adults not eligible for Medicaid can use the FQHC's sliding fee scale.

Another overarching factor for program continuance is the Michigan State Oral Health Plan for 2020 released in 2016. The number one goal is “to enhance professional integration between providers across the lifespan.” In addition, objective 3.5 is to increase the proportion of pregnant women who received comprehensive oral health care during pregnancy by 10%. The GH program helps to further the state's goals.

*Functional integration.*

There is a common electronic patient health record so OB/GYN and dental teams can view the record. The dental hygienist can enter dental findings and if needed, schedule a dental appointment for the patient immediately through the electronic system. The dental clinic has extensive appointment hours from 7 AM to 8 PM Monday through Saturday.

*Normative integration.*

The program is being continued because of administrative commitment to provide this community service. GH views the program as being beneficial for the patients. The dental hygienists' salaries are included in the operational budget. In the list of key values for the health center shown on the GH website, the first item is "The patient *always* comes first. We are dedicated to patient care." Some of the other relevant items listed include:

"We are a model for other clinics with our innovations in pilot health care programs and clinic operations. We form collaborative relationships with both public and private organizations. We have an entrepreneurial spirit but exercise it in partnership with others.

We continuously examine the services we provide and what is needed in the community. We look for cracks in the health care system, fill those, and move to fill new ones. When other community resources develop to address those needs, we make intentional decisions to apply our resources differently.

We use a team approach to providing health care, and involve the patient as part of our team."

### Performance Measures

Women are very receptive and there has been high acceptance of the program. The first woman completed the program in June 2015. Since November 2014, 605 women have participated from start to finish (not including 177 who are in process), and 377 women (62%) went to the dental department and obtained a dental treatment plan. This number includes women who were new patients needing a dental home, those without a periodic exam in the last six months or with an existing treatment plan needing an appointment for continuing care. Initially this rate was much lower. It keeps improving with time as familiarity with the program has grown internally and externally. Of the 228 women who did not go to the GH dental department for care, 39% had commercial dental insurance so may have a different dental home or would be referred to one. The other 61% were enrolled in Medicaid or qualified for the GH sliding fee scale and could have been seen. Among the first 272 women who followed up with a visit in the dental department, their treatment plans included 2,049 restorations and 578 extractions, and 31 dental abscesses were identified.



The website provides 2015 patient satisfaction survey results for the dental and OBYN clinics. It is not specific to the MIOH program. For example:

Patient responses to OB/GYN questions:

- 98% of patients were able to get an appointment as soon as they needed.
- 88% of patients felt their provider knew their medical history
- 99% of patients understood their plan of care from their visit.

Patient responses to Dental questions:

- 98% felt the dental staff/dentists were polite and helpful.
- 99% said their treatment plan was clearly explained.
- 99% indicated that all of their questions were answered.

### Health Literacy

GH's value statements listed on their website show a strong commitment to health literacy and cultural competency. There is a detailed orientation process for new employees that includes the "FISH!" philosophy that include being there for people with respect, enthusiasm and a positive attitude. The staff are taught motivational interviewing and to talk with patients, not at them, with language that engages them. The Quality Assurance Group monitors compliance with health literacy principles. Written materials provided to patients must be culturally relevant and edited to a sixth grade reading level. All new materials go through multiple levels of review to assure it meets health literacy guidelines. Staff are trained to have good communication skills and speak in ways that can be easily understood. There is a large Burmese population, and the staff use an iPad on a cart in order to provide face-to-face translation. Questions about understanding information received are asked on patient satisfaction surveys, though not specific to the MIOH program. Dr. Steely reported that oral health related knowledge was very low among this population and the women were very receptive to information about oral health for themselves and their babies. On his wish list is an intra-oral camera so he can show women directly what the problems are in their own mouths, where they need to do more brushing and flossing, and give them the intra-oral photos for motivation and follow-up.

### Barriers/ Facilitators During the Implementation of Integration

Overcoming Barriers: Oral health was not a traditional component of women's medical services and some OB/GYN staff needed to be brought on board. They were concerned that it would be more work for them and more things to remember. Initially, the OB/GYN support staff were expected to refer the women to the dental hygienist. This process was not successful and abandoned. The dental hygienists spent a lot of time with support staff to develop relationships and understand the OB/GYN process of care delivery and things got much better. Over time, providers became very receptive and realized that everyone needs dental care. They appreciate

that the dental hygienists are there as a quick resource if they have a dental question or the patient has a dental problem. At their initial pre-registration visit, the women are now presented with the oral health component as an integral part of the patient's obstetrical package. The dental hygienists also are proactive about seeking women and children for program inclusion. At first, the patients had difficulty scheduling and obtaining dental services in the GH Dental Department. This barrier was addressed by implementing shared dental and medical health records with the ability for the dental hygienist to make dental appointments. The GH Dental Department is open 78 hours per week, Monday-Saturday from 7 am to 8 pm. This wide range of hours facilitates appointments that do not conflict with patients' work hours. Staff work a 3-day 36-hour shift, either Monday, Tuesday and Wednesday or Thursday, Friday and Saturday, and rotate schedules. Walk-in appointments are also available for urgent care and emergencies. Heather Foulke, one of the certified nurse mid-wives at GH said she was ecstatic to have dental as part of the prenatal program because it has increased access to dental services for women.

The dental hygienists would like to schedule the successive MIOH appointments in advance, but OB/GYN does not schedule their appointments on a trimester time interval. The dental hygienists developed their own calendar tracking system to see when the MIOH women are due for their next trimester appointment. They work out appointments with the OB/GYN clinical support staff on a week-by-week and sometimes day-by-day basis.

There is a high no show rate and lateness for appointments is common. The dental hygienists try to be as flexible as possible to see women when they come for appointments. The women face multiple challenges with transportation, childcare, sometimes lack a working telephone to receive confirmation appointments and may have difficulty taking time off from work since OB/GYN does not have extended hours as the dental department does.

Dental hygienists cannot provide clinical treatment other than preventive services away from the dental clinic. They refer the patients who are Medicaid-insured or qualified for the sliding-fee discount to the dental clinic for treatment. Commercially insured pregnant women receive the health education program component but are not seen at GH for dental treatment. They have other options for dental services in the community. Dental Medicaid reimbursement is low and has not been raised since the 1990s. Not many private dental practices accept dental Medicaid. GH is a critical source of dental care for low-income members of the community.

Facilitators: A critical ingredient for program success was hiring the right people, great dental hygienists who have children of their own, have a vision and passion, and are willing to be part of the primary care team. The PA-161 program and shared electronic health records were key facilitators. Oral health champions in the dental program and administration were needed for initial implementation and continued sustainability.

## Future Plans

The Detroit Mercy Dental School received a grant from the Michigan Department of Health and Human Services to develop a similar Michigan Initiative for Mother and Infant Oral Health. This planned program is similar to GH for implementation in six sites across Michigan, five that are FQHCs with dental clinics and a non-profit community health center where patients can be referred to Detroit Mercy for dental care. DHs will be located in the OB/GYN clinics using portable dental units. Regional coordinators will work with the pregnant women after their first dental hygiene visit to help facilitate follow-up dental care. The program is expected to start in August, 2017 (personal communication, 7/11/17 with Dr. Byrappagari).

The GH dental hygienists have been working with the Pediatrics Department for several years seeing children for the age 1 dental visit. However, Dr. Steely would like to formalize this endeavor to embed dental hygienists in the Pediatrics Department in a more integrated, interdisciplinary approach, similar to the OB/GYN model. Resources are being sought for physical plant modification and equipment. He would like to see more children get access to dental care and impact the GH Clinical Quality Measure (CQM) performance for 6-9-year old patients at moderate-to-high risk for dental caries. He would also like to see dental hygienists become part of the primary care/family practice unit.

## Grace Health Case Study Summary

This innovative program integrates oral health education and preventive services for pregnant women and new mothers into a busy OB/GYN department in an FQHC. Two dental hygienists work closely with OB providers and staff as well as, in a less formalized manner, the Pediatrics Department to provide preventive oral health services for young children. Many key elements have led to success. These include state legislation that permits dental hygienists to provide education and preventive dental services to underserved populations with indirect dentist supervision, and some initial grant funding. Having a visionary and supportive GH administration, hiring dedicated, energetic and flexible dental hygienists with a team approach to care with their collaborative colleagues in OB/GYN and Pediatrics, providing physical dental hygienist space and equipment in the OB/GYN suite, and an integrated electronic patient health record, are all core components of this integration of oral health into primary care.

The following quote from the Michigan Department of Health and Human Services' Christine Farrell, Oral Health Program Director and Emily Norrix, Perinatal Oral Health Consultant sums up the MIOH program well:

“The Maternal Infant Oral Health Program at Grace Health is a stellar example of interprofessional integration and practice that works to not only break down silos between the medical and dental professions, but also reduce barriers that impede pregnant woman and

infants from receiving oral health care. This innovative program is increasing access to care and improving the oral health of some of Michigan’s most vulnerable residents.”

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## Case Study 4

### Willamette Dental Group in Collaboration with InterCommunity Health Network Coordinated Care Organization

#### *Paving the Road for Oral Health Integration*

#### INTRODUCTION

This is an innovative example of state-wide legislation in Oregon requiring comprehensive integration of physical, behavioral, and dental health services associated with a transformation of their Medicaid system. The beginning of the Coordinated Care Organization (CCO) model began in 2012 when the CMS waiver was approved and 16 CCOs were created with a mandate for all CCOs to contract with a Dental Care Organization (DCO). Willamette Dental Group contracted to join the InterCommunity Health Network CCO (IHN-CCO). The IHN-CCO partnership currently serves more than 54,000 Medicaid members. Willamette is expecting to serve around 95,000 Medicaid members.

#### CASE STUDY METHODS

We selected this case study for several reasons. It is an innovative and transformative example of state-wide legislation requiring comprehensive integration associated with a transformation of the entire Oregon Medicaid system. The transformation program is in its third year. The program tracks performance measures, and the Oregon Health Authority (OHA) tracks and compares state-wide data, by race/ethnicity (R/E) and by each of the 16 coordinated care organizations (CCO) participating in Medicaid.

Data collection included:

1. Review of the Willamette Dental Group and Dental Care Organization (Willamette or DCO) website, review of the CCO website
2. Document review of PowerPoint presentations about the program, and Health Management Associates' environmental scan prepared for Oregon, plus manuscripts.
3. Discussion with Matthew Sinnott, B.S. M.H.A., Director of Government Affairs and Contract Management, Willamette about participation in Case Study.
4. Discussion with IHN-CCO Britny Chandler Dental Program Clinical Coordinator about participation in Case Study.
5. Interviews by the case report authors (KAA, GRR, JAW) with Willamette staff: Matthew Sinnott, Director of Government Affairs and Contract Management.

Debra Lamping, Member Services Compliance Coordinator  
Yuberca Pena, Contract Management and Compliance Specialist

6. Interviews by the case report authors (KAA, GRR) with IHN-CCO staff:  
Britny Chandler Dental Program Clinical Coordinator  
Tamatha Tracer Director-Operations
7. Review of draft by Willamette and IHN-CCO for accuracy.

## FINDINGS

### History and Background Information

#### *History of Oregon Reform.*

In 1994, Oregon requested an ‘1115 waiver’<sup>1</sup> from the Centers for Medicare and Medicaid Services (CMS) to transfer the Oregon Health Plan (Oregon’s Medicaid program) from fee-for-service to managed care (Gray, 2017). This arrangement between Oregon and the CMS is important because it offers substantial flexibility to the state in managing the Medicaid program. It also provides CMS a mechanism to hold Oregon accountable to cost and quality benchmarks, or lose the money. Thereafter, between 1994 - 2012, Oregon had three siloed managed care providers – physical/medical, dental, behavioral/mental health. Health reform began in Oregon in 2009 when the Oregon Health Authority (OHA) was created as a new agency of the state government. The OHA was awarded responsibility for health care purchasing, including Medicaid and the State Children’s Health Insurance Program (SCHIP) and oversight of a new “health system transformation”. The components that the OHA were awarded, in addition to health reform included the “state and school district employees benefits purchasing and oversight, mental health and substance abuse programs, and public health programs” (HMA, 2016). The beginning of the CCO model began in 2012 when the funding came under the approved CMS waiver and the 16 CCOs were created. Now, several years into the coordinated care model that health reform is bringing, over 90% of the 1 million Oregonians who are on Medicaid (25% of the population) receive care through the new coordinated care program.

Under state law and contract, a CCO provider is responsible for managing and delivering physical, behavioral, and oral health services, on one global budget. The dental payment is negotiated and comes through the CCO out of the global budget. The payment for health care services is based on the approved package of services. The Health Evidence Review Commission (HERC) looks at the evidence for specific services and creates one global list of ICD IX codes (services) and arranges the codes in order of priority, deciding on a threshold for what will be

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<sup>1</sup> Section 1115 of the Social Security Act gives authority for a grantee to approve experimental, pilot, or demonstration projects that promote the objectives of the Medicaid and Children’s Health Insurance Program (CHIP) programs.

covered. The State of Oregon actuary service works with CMS to demonstrate that the capitation rate is actuarially sound.

CCOs share some characteristics with Accountable Care Organizations (ACOs). Like ACOs, the CCOs are held accountable for the quality of care they provide; have a pool of money held back that they can earn if they achieve their health performance targets and a second pool the organization can earn through hitting the spending growth target caps. Like an ACO, a CCO has shared governance that includes both providers and member beneficiaries. However, the CCO Governing Board, which includes the CEO for the INH-CCO, the President and CEO for Samaritan Health Plans also has the Chair of the IHN-COO Community Advisory Committee (CAC), three community members, two physicians, a county administrator and two county commissioners. The wide community representation is required by statute and is accompanied by metrics for improving population/community health and to demonstrate efforts to reduce health disparities. Under HB 2882, which was approved in April 2017, CCOs are now required to have a dentist on their governing board. The CCO has a global budget which includes physical, behavioral and dental health for which it is intended to pay for outcomes, not services, although, unlike ACOs, CCO budgets allow for local flexibility, including services that may not have reached the HERC cutpoint and may not meet the definition of “medically necessary.” CCOs are held accountable for both quality and access to care (McConnell, et al., 2014).

There are 16 CCOs in Oregon and nine DCOs.

*Willamette Dental Group.*

Willamette opened in 1970 when two pioneering dentists decided to create a dental practice designed to encourage “preventive care and long-term oral health, instead of the traditional fee-for-service” (Willamette website, accessed July 18, 2017) Willamette contracted with Blue Cross Blue Shield in the 1970s to create Dentacare – one of the region’s first coordinated care plans, and in 1983, they began to offer individual pre-paid dental plans. Willamette itself embodies a vertically integrated dental-only ACO through a collection of interdependent companies in Oregon, Washington and Idaho that offer comprehensive dental care services, dental insurance, and business management and administrative services.

Willamette’s mission statement, recently revised, is to “deliver proactive patient care through a partnership with our patients to stop the disease-repair cycle by means of evidence-based methods of prevention and treatment.” (Willamette website, accessed July 18, 2017) They have four core values:

**Innovation:** Embrace change, encourage invention and continually remain at the forefront of advances in oral health for the good of our patients, colleagues and company.

**Health:** Exemplify and promote whole-person wellness through education and support of programs that keep our patients and employees healthy.



**Compassion:** Demonstrate caring and sensitivity for the diverse backgrounds of our patients and colleagues and generosity in our communities.

**Integrity:** Adhere to high ethical and professional standards, demonstrating commitment to our responsibilities with trust, honesty and respect for all.

In keeping with this mission, Willamette has been a Medicaid provider for 42 years.

*InterCommunity Health Network - Coordinated Care Organization (IHN-CCO).*

IHN-CCO was formed in 2012 by local public, private, and non-profit partners to unify health services and systems for Oregon Health Plan (Medicaid) members in Benton, Lincoln, and Linn Counties. They are committed to improving the health of local communities while lowering or containing the cost of care by coordinating health initiatives, seeking efficiencies through blending of services and infrastructure, and engaging all stakeholders to increase the quality, reliability, and availability of care. The IHN-CCO partnership is the fifth largest CCO by size of the covered panel, currently serves more than 54,000 Oregon Health Plan members. IHN-CCO contracts with four DCOs including Willamette.

IHN-CCO proudly lists their values as:

- Stakeholder participation in design and delivery of health care
- Prevention, early intervention and self-care
- Promotion of family health as a means of improving readiness to learn and adoption of lifelong, healthy lifestyles
- Maximizing utilization of existing health resources
- Achieving positive health outcomes through evidence-based health programs
- Delivery of service that is culturally sensitive
- Coordinated care using the patient-centered, primary care home model
- Maintaining continuity of care for patients through integration of services
- Utilizing performance and outcome data to guide design and development of our health care delivery systems
- Strengthening community infrastructure to promote healthy neighborhoods.

Ms. Tracer summarized the organization's values saying, IHN's mission is to "care for and coordinate those most vulnerable in the service region." That mission is apparent in the Transformation Plan IHN-CCO submitted for 2015-2017.

The Plan has eight elements:

- Integration of care: Creating a health delivery model that integrates mental health and physical health care and addictions and dental health, when dental services are included. This plan must specifically address the needs of individuals with severe and persistent mental illness.

- Patient-Centered Primary Care Home: Continuing their implementation and development of a Patient-Centered Primary Care Home.
- Alternative payment methodologies: Implementing consistent alternative payment methodologies that align payment with health outcomes.
- Community Health Assessment (CHA) and Community Health Improvement Plan (CHIP): Preparing a strategy for developing a health assessment and adopting an annual CHIP.
- Electronic health records: Develop a plan for encouraging across discipline electronic health records, health information exchange, and meaningful use.
- Communications, outreach and member engagement: Ensuring communications, outreach, member engagement, and services are tailored to cultural, health literacy, and linguistic needs.
- Meeting the culturally diverse needs of members: Ensuring that the culturally diverse needs of members are met through a combination of cultural competence training, adjusting the provider composition to reflect member diversity, use of Certified Traditional Health Workers and Traditional Health Workers composition consistent with member diversity.
- Eliminating racial, ethnic and linguistic disparities: Developing a quality improvement plan focused on eliminating these disparities in access, quality of care, experience of care, and outcomes. (<https://www.ihntogether.org/transforming-health-care>, accessed July 19, 2017)

*Motivation and Philosophy for Integration.*

During the health reform process, which started with the creation of the Oregon Health Plan (OHP) in 1994, dental plans, mostly capitated managed care plans were incepted as Dental Care Organizations (DCOs). As health reform evolved under the advent of the CCOs, the DCOs were included as part of state-wide reform plan, for which integration of the constituent member groups, physical/medical health, mental/behavioral health and oral health became tightly connected through one budget with a whole health perspective on serving the patient.

Willamette has seen an evolution in membership during the transition; from around 70,000 enrolled members preceding the inception of CCOs, growing to 85-90,000 members with Medicaid expansion, and now expected to level off around 95,000 members. (Some of Willamette’s members will not be INH-CCO members.) Oral health integration started somewhat late, after the CCO implemented the behavioral health integration program. However, as the consultants for the program, HMA said, “the importance of improving oral health services, prevention, and education is gaining more attention in Oregon and is now one of seven priority areas in Oregon’s State Health Improvement Plan” (HMA, 2016).

### *Integration of Oral Health and Primary Care*

Before the transformation to CCOs, Willamette had one statewide contract with the Oregon Medicaid program to provide capitated dental services for patients covered under Medicaid. The state's sudden assembly of a large multi-provider organization brought together to coordinate better care for patients has had some bumps in the road for Willamette and other dental plans. Organizationally, the state had anticipated that the dental plans would become subsidiaries of the CCO organization to create one organization (Gray, 2017). Instead, the DCO's remained independent organizations, but contractors to the CCO. Through the contract with the CCO with which they share a service area, the DCO must adhere to all of the performance metrics and requirements for community and population measures established by the state and organized by the CCO. For dental, the only state-required improvement measure for 2016 was dental sealants for children. Dental was also added to the assessment for foster children metric, making the metric inclusive of physical, mental and oral health assessments for foster children.

Between July 2013 and July 2014, when joining the reform effort, Willamette contracted with eleven CCOs, of the 12 that were available in the regions (zip codes) in which Willamette had previously operated under the single statewide contract with the OHA. According to Mr. Sinnott, Willamette considered the time and distance for people to get to a dental office before signing on to cover a region by contracting with the associated CCO. The regulatory metrics to be included as a service provider are to have an office within a time/distance of up to 30 minutes/30 miles in urban settings and 60 minute/60 miles in rural areas. Willamette chooses to use the standard of 30 minutes/30 miles across the board, because they believe people are less likely to use the dental office if the time/distance is too great. The tri-county region represented by Benton, Linn, and Lincoln counties are predominantly rural and public transportation is scarce.

As summarized by the Regional Oral Health Coalition in 2015 as the program was just getting underway, the needs of the tri-county area were great. "The vulnerable populations [of Benton, Linn, and Lincoln county] who are most in need of these services continue to fall through the cracks. Oral disease remains a major regional problem— especially for adults in general and for low-income, uninsured, senior, undocumented, homeless and racial/ethnic minority populations in particular. Despite ongoing efforts to meet the oral health needs of all tri-county residents, nonwhite race/ethnicity, lower education levels and lower socioeconomic status continue to be strong predictors not just of higher than average rates of oral disease, but also of a persistent lack of access to timely, affordable and appropriate care" (Oral Health Coalition, 2015). Thus, the need for integration of oral health into the health care system was there.

### *Clinical Integration.*

Clinical integration refers to an organization's ability to coordinate patient care services across different times, places and professional disciplines. The responsibility for integrating the disparate organizations represented by each clinical unit clearly lies with the CCO. Ms. Britny

Chandler was an Expanded Function Dental Assistant for five years before coming to IHN-CCO. She said she was “employed by IHN-CCO to aid in the administrative coordination of the beginning stages of dental and medical integration.” She believes she is the only dental professional in IHN-CCO’s 3-county organization. Ms. Tamatha Tracer agreed that dental was not well-integrated as of yet. IHN-CCO had not worked with dental providers before so they have been taking their time to communicate with the DCOs to learn about oral health and how to bridge dental and medical services. They want to find out how oral health services brings value to the overall operation.

IHN-CCO found it requires substantial communication and willingness to learn to make clinical integration and coordination of care happen. IHN-CCO and their service partners have several pilot initiatives that were designed to engage medical and dental care service partners and initiate discussion around how to integrate to improve whole-health care. Willamette was involved in the diabetic pilot. IHN-CCO targeted 10 of their 65 clinics for the diabetic pilot. Selection was based on the population size of each clinic’s IHN-CCO’s diabetic population. The 7 clinics that responded with interest in participation of the pilot were invited to a Lunch and Learn on the oral-systemic connection, oral health patient screening, the dental referral process, and a description of the items included in the dental hygiene kit and its use. According to Ms. Chandler, IHN-CCO learned first thing who the dental champions were to carry pilot ideas forward! In the 2<sup>nd</sup> year of the pilot (January 2016) IHN-CCO expanded the pilot efforts to Lincoln County by including another clinic based in Newport, Oregon. As evidence of the collaboration’s learning and quick systems implementation, implementation for the Newport clinic took only 30 days compared to 6 months for the first 7 clinics in the first year. IHN-CCO attributes the success to taking medical clinic workflow implementation feedback (struggles and successes) and making adjustments.

Within 2 years, the first pilot was proposed, had gotten through the submission and approval process to the OHA, and was up and running. Both IHN-CCO and Willamette have been pleased with the results of the initial discussions for integration. And, although IHN-CCO had anticipated offering Lunch & Learns for one year only, the groups have continued to meet.

The service area covered by IHN-CCO is a challenging area, composed of three counties, and all of them rural to some degree. There is a high concentration of Medicaid members and much variability in demographics and geography. The demographics and community challenges provided the inspiration for a performance improvement plan (PIPs) submitted to the OHA: trying to get a handle on the opioid crisis among the CCO members. “Oregon’s Prescription Drug Monitoring Program (PDMP) shows that prescribed opioid use is pervasive among Oregonians. In 2013, almost 1 in 4 Oregonians received a prescription for opioid medications, and in a recent national survey, Oregon ranked second among all states in non-medical use of pain relievers (i.e. prescription pain medication)” (Oregon Health Authority, 2015). “The state Legislature enacted legislation to establish a Prescription Drug Monitoring Program (PDMP) in

2009... [that] is focused on helping health care providers assess the controlled substances prescription history of their patients, and to identify concerning behaviors (e.g. multiple prescriptions from multiple providers and pharmacies, high doses of opioids or opioids for extended periods of time, etc.) that lead to substance misuse or overdose” (Oregon Health Authority, 2015, pp. 8).

A former employee of IHN-CCO sent internal reports based on claims data (e.g. Emergency Room Utilization for Non-traumatic Dental Conditions and a monthly list of prescribing habits of opioids by dental provider). Once the DCO and member dentists saw the value of understanding broader system-wide data, the DCOs connected to the Oregon Emergency Department Information Exchange (EDIE) where the dentists can now get real-time data and reports of information on the patient in their chair who received a prescription at the Emergency Department (ED). There were no surprises on prescribing habits of the Willamette providers, because Willamette had issued guidelines 8 months earlier around prescribing in their organization-wide EHR and set up the capability for the provider to query the habits of other dental providers to avoid redundancy of prescribing. But, this took integration to a new level, connecting the dental providers with the ED.

*Professional integration.*

The shared understanding and goals of a continuum of care describes professional integration. The first integration experience for Willamette was a challenging, and sometimes turbulent, one. Although Willamette had provided ambulatory care under CMS for many years, as the DCOs transitioned to being a partner with a CCO, the oversight and compliance became much more complicated and exacting. They had to comply with the same external quality review and many NCQA accreditation standards as the CCO and medical providers, although the standards were commonly not written for, nor were explicitly applicable to dental. It was a struggle for the DCOs and required much communication and cooperation between the DCOs and the CCO. IHN-CCO assisted in this by hiring a specialist to help work through the nuances of the contracting and changes to workflow and reporting.

IHN-CCO recognized early the challenge of securing integration among professionals who did not belong to the same discipline, nor come from one organization. IHN-CCO approached the integration on multiple fronts. One tact was to use electronic communications. The Samaritan Health Plans-IHN-CCO website hosts a Provider News section and Ms. Chandler used this vehicle to boost providers’ knowledge and interest on integration. She developed a six-part series in 2015-16 on oral health and physical health integration in which she provided information on select topics such as the use of expanded practice dental hygienists (EPDH) in pilot programs within some IHN-CCO medical offices, Oregon’s First Tooth program which is a program in which health care professionals can perform and be reimbursed for an oral assessment (D0191) and fluoride varnish (D1206) in a medical setting, a general topic on the oral-systemic connection and why it is advantageous to integrate, the IHN Diabetes Mellitus Pilot, and an

education piece on Oral Health During Pregnancy. The Provider News is posted on the IHN-CCO website. About half of the DCOs are participating in a pilot study utilizing EPDH in medical offices in anticipation that the process could spread to other dental offices.

IHN-CCO also reached out for the past three years through the Transformation Team by engaging health plan providers, partners, and community support groups in discussions on how transformation could improve health in the community. Some of the ideas and pilot projects and performance metrics came directly from these discussions. For example, a performance improvement plan (PIP) involving dental care initiated during 2015, and submitted in January of 2016, demonstrates the early acceptance by primary care of the importance of oral health integration to overall primary care.

Ellen Altman, RN submitted a PIP application to concentrate on one of the required focus areas for the CCO's performance improvement as outlined in their OHA contract, "improving perinatal and maternity care" by initiating a plan to educate pregnant mothers to seek dental treatment at least once during their pregnancy. The topic also aligned with the CCO's Transformation Plan to further integrate dental health with physical health. A data query of IHN-CCO's pregnant members in 2015 dental claims showed that less than 25% of pregnant women had a dental visit during their pregnancy, even though IHN-CCO had supplied printed educational materials to the Regional Maternity Care Coordinators (MCCs) to give to their members. Therefore, the MCCs and DCOs worked together to develop an educational letter about the importance of oral health during pregnancy, which was mailed on a monthly basis to pregnant women. The MCCs used the materials to educate the pregnant members on oral health and encouraged them to make an appointment. An additional intervention included reminding the OB clinics to formally refer people to the dentist, so that tracking can occur. A qualitative review of the OB clinic to see if they made the referral found that 4 of 9 clinicians said no, because they weren't "accustomed to entering referrals for dental". IHN-CCO set up a follow up step for a combined engagement between IHN-CCO and Dental to visit the OB clinics to provide direct education about healthcare and pregnancy and assist with any workflow concerns. Beginning in Quarter 2 2017, IHN-CCO began tracking the members on a monthly basis to see if dental appointments did occur.

#### *Organizational integration.*

Stand-alone organizations become integrated through the agreements, contracts, and alliances they create that lays the framework for the strong collaborative accountability that one needs to deliver patient-focused comprehensive care. While integration may have been slow at the clinical and professional levels, at the system level, integration began at Day 1 through the state-mandated contract. Because the DCOs had to individually contract with each CCO in their region, Willamette had to complete eleven contracts to continue to provide Medicaid services. And, despite each CCO having the identical contract with the OHA and the quality and

compliance requirements for dental plans being the same, the contract offered by each CCO to the DCOs varied greatly because the CCOs varied in their interpretation of the requirements, preferences, community needs, and the CCO's incorporation and tax status. When asked how communication had gone in this challenging first year of a new integration program, Willamette, responded that IHN-CCO had been a great partner – valuing the collaboration, putting thoughtful leadership into listening to the DCO, and investing in staffing to help the DCOs integrate with the CCO.

The Oregon system reform includes a component designed to accelerate the transformation of the healthcare system, a program to fund pilot projects and programs that providers or local agencies suggest to the CCO would improve the care delivered through the integrated health care system in their local region. The IHN-CCO Transformation Plan was approved by the CMS in 2013 and included eight components. IHN-CCO works with the Oregon Health Authority in selecting the pilots that offer quality improvement toward achieving Oregon's health system transformation. One such program involving dental and primary care providers was the Diabetes Mellitus Pilot.

IHN-CCO came to the DCOs and medical providers to suggest a Pilot Project Community Health Improvement Plan (CHIP) to CMS and the Oregon Health Authority. CHIP pilots have to address one or more of the components of the CCO's Transformational Improvement Plan to help achieve the Triple Aim progress of better care, with better member experience, at lower cost. IHN-CCO set up an open dialogue with the DCOs, medical providers and the Public Employees group to discuss the opportunity to address diabetes. The two-phase plan aligned with the goals of improving member communication, lowering healthcare costs through delivery-system integration, and increasing appropriate member preventive medical and dental utilization, and with clinical outcomes of improving A1c levels and periodontal health.

The first phase of the pilot ran over a calendar year. The leadership at IHN-CCO brought the group together to collaborate on development of education materials about diabetes and oral health, which were then adjusted as needed at each DCO. The member education aspect included a simple mailing to each diabetic patient of the education materials about oral health and diabetes. The second component was to approach diabetic patients as s/he was seen in either the medical or dental clinic. Medical providers would educate their diabetic patients about the importance of good oral health for diabetics, ask two screening questions (Have you seen your dentist in the past 12 months? Are you experiencing any dental pain?) and refer their diabetic patients who responded they had not seen a dentist or had pain to the dentist.

Willamette built outreach to the dental offices explaining the pilot design, materials and procedures to ask if the patient had seen their medical provider within a year and make a referral if not. Willamette used their central EHR to make the process simple for the dental office by alerting the office when a pilot patient was scheduled to ask about medical care and conduct a

referral. Each contracted dental plan completed a chart review of about 40 pilot patients and sent the data to IHN-CCO.

As the analysis phase was going on, the design was tightened for a second phase. The DCOs provided information on their names and office telephone numbers to the medical clinics, as the medical providers said there was no provider database with contact information. Willamette provided the medical offices with information on which diabetic patients had regular versus episodic dental visits. The design now established that the primary care providers would intervene for the episodic dental patients, ones who got regular medical care, but only episodic dental care (e.g. No show appointments, tooth extracted with no follow up). Willamette took on the diabetic patients with no dental visits and contacted people and encouraged them to come to the dentist.

While the final clinical and financial results were not yet available, IHN-CCO facilitated a catered Lunch & Learn to get providers together to debrief the pilot and how to apply the lessons they learned. The first pilot was deemed a success to the integration collaboration because medicine and dental learned to work together on behalf of improving patient care. They created the first building blocks to communicate going forward.

Successes in improving health care costs or health outcomes with programs like the diabetes pilot can earn some of the incentive or performance hold back money to share among partners in the IHN-CCO. Cost savings to the State and to the CCO is predicated on the use of a global budget, that is, a risk-adjusted, per capita payment paid by the State to each CCO. The CCO then pays a per-member/per-month payment to Willamette and other provider groups through their contract. According to IHN-CCO, a high proportion of the budget goes directly back to the providers. However, “the OHA is exploring different incentive pools, with currently 4% of the budget held back in a quality incentive pool that can be earned by the performance of the CCO and the representative organizations under contract with them” (HMA, 2016) Such alternative payment provisions provide additional payment based on performance. While the State has established this as an ‘all or none’ basis on earning performance money, IHN-CCO is putting in place some alternative methodologies to incentivize the specific provider DCOs who meet the metric, whether or not system-wide success is achieved.

#### *System Integration.*

System integration involves stakeholder management, considering the formal and informal arrangements needed so the clinicians can deliver a comprehensive continuum of care. Ms. Tracer reminded us that IHN-CCO is also required to partner with other groups in the service area, the Department of Public Health, community providers, the physical and mental health providers, whatever IHN-CCO will need in order to gain a whole health perspective on what the members need, and what is needed to improve the community or population health and reduce disparities in health. The CCO is required to consider a population perspective, to consider the



social determinants of health, in order to determine how comprehensive patient-centered care can improve their health and quality of life. Therefore, IHN-CCO is considering such questions as, ‘Where are the food deserts in the county?’ and ‘Should IHN-CCO collaborate with housing and shelter groups?’ because good food and housing are important to good health and well-being. The consideration of the social determinants is still in the planning stage, but through partnering each CCO must address this with their plan in order to achieve the performance metrics in the Transformation Plan.

An example of the broader system integration of the provider partners to improve performance and community health was demonstrated in the summer initiative to get sealants and oral health education to the children of Linn, Benton and Lincoln counties. Dental sealants for children was one of the state-approved goals that, while not achieving the full benchmark rate, demonstrated significant improvement! For CCO and its partners, achieving these goals could earn the partnership a performance incentive. So, a community-wide program on sealants was prioritized by the four DCOs on the IHN-CCO collaboration team in order to improve the sealant program results, another performance metric for the IHN-CCO system. Having met the sealant, as well as other benchmarks and improvement targets, brought an additional financial benefit of almost \$11 million dollars (Hall, 2016).

#### *Functional Integration.*

Functional integration encompasses the support services, technology and people who coordinate the continuum of care that enables a person-centric health care delivery system. IHN-CCO realized at the outset that they would need Health Information IT in order for IHN-CCO to share patient information to the DCOs and for the DCOs and medical offices to share information with each other. They built the need for the EHR into their Transformation Plan. IHN-CCO also recognized they lacked expertise in the dental field and hired a DCO coordinator with experience in the dental field, and when the contracting and NCQA standards became a hold-up to finalizing the contract, IHN-CCO brought in a consultant for that as well.

At the DCO level, Willamette has central EHR and is testing a care coordinator module within the EHR to help to streamline information needs among their providers. It was used in the Diabetes Pilot to assist the dental providers to efficiently complete the data collection of the screening questions and the referral. Willamette also used this to identify and map diabetic patients to the top five medical offices to expand a future program to improve preventive access to care for diabetics, and they are discussing the opportunities with CCOs and medical providers to expand to patients with heart disease. Providing care coordination to multiple disciplines is a functional integration challenge. Each clinic has a different process. Building the oral health assessment into the medical clinic required one set of workflow processes. This workflow change applied to only the medical clinic, however because the internal Willamette EHR was not interoperable with the medical clinic EHR and there was no functional way to electronically

make bilateral referrals and/or schedule patients in the others' clinics. The medical staff who tried to personally call the dental clinic and ask for an appointment complained that there was a long hold on the telephone, so they reverted to a paper referral. The medical providers were accustomed to receiving a referral response in order to complete (close) the referral and complained of the lack of knowledge as to whether or not a patient who had been referred was scheduled and/or seen. These are examples of where failures to communicate, through people or technology can undermine a solid collaboration.

#### *Normative Integration.*

Strong leadership and an ability to create a collective vision and value system are critical to successful integration. State-wide leadership had designed an ambitious community-centric proposal to improve person-specific and community-wide health. The Transforming Health Care initiative that was approved by CMS gave Oregon the flexibility to attempt this ambitious health reform initiative. The State Transformation program, that mandated that both behavioral and dental health were to be included in all care coordination organizations, opened the door for the development and implementation of the collaboration/integration program between Willamette and IHN-CCO.

Both IHN-CCO and Willamette had strong community-centric goals and values. And, in considering the outcome measures for the Transformation Plan followed through in a plan to improve population and individual health. The IHN-CCO website shows the outcome measures for IHN's Transformation Plan. One clearly sees the vision that whole-health extends beyond the health care system to consider social determinants of health. For example, for Access to Care, the outcomes were: Increase the percentage of members who receive appropriate care at the appropriate time and place; and, Increase the percentage of members who receive care communicated in a way that ensures that they can understand and be understood by their care providers, and that they are effectively engaged in their care. In the Maternal Health section, the outcomes also required a population health perspective: Reduce the rate of unplanned pregnancies; Increase the percentage of women of childbearing age who receive early and adequate pre-conception and prenatal care and who connect with appropriate resources throughout their pregnancy; and, Increase the percentage of women, infants, and families — particularly those with identified risk factors — who access postpartum care and support. The leadership of both Willamette and IHN-CCO gave clear indications to their members and providers that they were engaged in working out a shared vision for improving health in the community and the membership through integration of health.

#### *Performance Measures*

There are many levels of performance measures for the IHN-CCO system because this is an ongoing State-wide program, with reporting responsibilities to the Oregon legislature and CMS. Statewide, the Oregon Health Authority measures state-wide performance, and compares each

CCO in their report on quality measures (e.g. percentage of adults with any dental visit, percentage of children receiving fluoride varnish), provider distribution (e.g. FTE dentists per 1,000 Oregonians), patient experience with care under the OHP Medicaid program (e.g. percentage of CCO members who report having a regular dentist, and percentage who were able to see a dentist as soon as they wanted in the case of a dental emergency) and, coordination of care (e.g. percentage of CCO members who were seen in the ED for non-traumatic (caries-related) dental reasons and visited a dentist within 30 days following the ED visit and CCO members identified as having diabetes who received at least one dental service within the reporting year) (OHA, 2017).

The measures are selected by the Oregon Health Authority, based on recommendations from the Oral Health Workgroup of the Medicaid Advisory Committee, the Dental Metrics Workgroup of the Metrics & Scoring Committee, and the CCO Oregon Dental Workgroup. For 2017, the comparisons were made only to members of a CCO, not patients covered under fee for service. Data are reported at the state level, by race/ethnicity, by CCO, and sometimes by age. Most measures include data reported for two time periods: 2015 (Jan. 1– Dec. 31, 2015) and mid-year 2016. An example of each category of performance metric is provided in Table, below.

**TABLE 5-4-1** Selected Examples of Dental Performance Metrics Used for Oregon Transformation

Topic	Any preventive dental service Adults				All children age 1-21 who received at least 2 fluoride varnishes / year			
	Statewide		IHN-CCO		Statewide		IHN-CCO	
Quality	2015	2016	2015	2016	2015	2016	2015	2016
		18.1	19.4	18.1	19.6	14.5%	16.3%	15.7%
Patient Experience	CCO members who report having a regular dentist				CCO members who were able to see a dentist as soon as they wanted in the case of a dental emergency			
	Statewide		IHN-CCO		Statewide		IHN-CCO	
	Child	Adult	Child	Adult	Child	Adult	Child	Adult
	79%	57%	77%	49%	52%	44%	57%	47%
Care coordination	CCO members (all ages) who were seen in the emergency department (ED) for non-traumatic (caries-related) dental reasons and visited a dentist within 30 days following the ED visit				Adult CCO members identified as having diabetes who received at least one dental service within the reporting year			
	Child	Adult	IHN-CCO All ages		2015	mid-2016	IHN-CCO 2015 mid-2016	
		53.4%	35.1%	42.4%		24.2%	24.1%	27.9%

Performance measures are also collected that were developed by the CCO to measure the success toward implementing their individual Transformation Plan. The IHN-CCO Transformation Plan Initial Progress Report, March 2016, included the following dental-related and health literacy performance measures:

**Transformation Area 1: Integration of Care:**

**IHN Dental Medical Integration for Diabetic Patients**

- Counts of diabetic patients asked screening questions.
- Identified diabetic patients receiving referrals from their Patient Centered Primary Care Home (PCPCH) to Primary Dental Provider
- Patients receiving prophylactic and periodontics treatment
- Identified diabetic patients receiving referrals from their Primary Care Dental Provider to their PCPCH
- Pre/post A1c measures

**Benchmark 6.2 Cultural Health Literacy and Linguistic Needs of Members**

Establish baseline measurement by assessment of IHN-COO website pages and linked documents:

- Plain language/reading level
- Federal Section 508 requirements for accessibility
- Available in both English and Spanish.

**Transformation Area 8: Eliminating racial, ethnic and linguistic disparities**

- Pilots utilizing Community Health Workers/ Traditional Health Workers

The Environmental scan conducted by the Health Management Associates notes, “Measuring oral health integration with physical and behavioral health is a challenge. There are no commonly accepted or tested metrics to apply to monitor the progress of integration.” (HMA, 2016 p.31) The State of Oregon and the IHN-CCO have put great thought into developing measures that can document important and relevant aspects of oral health integration. Time will tell whether the measures demonstrate an effective oral health integration took place in Oregon.

*Health Literacy and Integration.*

The tenet of Health Literacy is apparent in the materials, plans, metrics, and discussions at multiple levels of the IHN – Willamette collaboration. Beginning with the leadership, Health Literacy was addressed explicitly in three of the eight goals of the Transformation Plan. Regarding ‘Communications, outreach and member engagement’, the CCO committed to making services that are tailored to cultural, health literacy, and linguistic needs. For the pilot Pregnancy and Dental Education PIP, IHN-CCO defended the initiative as aligning with the CCO’s

Transformation Plan because the education program was a health literate approach to satisfy linguistic needs.

For the next goal, ‘Meeting the culturally diverse needs of members’ the CCO and partnering organizations promised to ensure that the culturally diverse needs of members are addressed through a variety of means, cultural competence training and selecting providers and Certified Traditional Health Workers and Traditional Health Workers that reflect the members’ diversity. In the third goal, the CCO committed to trying to eliminate racial, ethnic and linguistic disparities in access, quality of care, experience of care, and outcomes. At the operational leadership, IHN described the annual cultural competency training that was provided to IHN employees and outside participating agencies. IHN also mentioned that the marketing director has ‘passion for communicating with people where they are at’ and emphasizes best models for communications.

At the clinical level, care coordination is defined and, ultimately managed between IHN-CCO and the provider offices to help patients navigate a complex health care system. Such navigation is an excellent HL example! At the functional integration level, OHA established a requirement for transportation benefits to enable people with transportation difficulties to access any provider appointments. IHN-CCO looks at the trends (low income, geography) in use of the transportation benefit on a quarterly basis to see if the contracted benefits are serving the community of members. Willamette uses the Press Ganey Satisfaction Survey that includes questions on convenience of office hours, providers’ concern, caring, and courtesy shown to members, and the degree to which the dentist talked to you in language you understand.

The Regional Oral Coalition (2015) spoke to the importance of health literacy and cultural competency for improving health in this region. “As the tri-county region continues to diversify, it must support and strengthen the cultural competence of its dental workforce to address language differences and other cultural barriers to care. Simply increasing options for care is not enough; unless providers and policymakers address the underlying economic and cultural factors that affect dental care utilization and outcomes within specific communities, disparities and inequities will persist. In particular, there is a clear need for skilled medical translators in dental practices and related settings. Although Hispanic/Latino is the largest minority group in the tri-county region, many of the residents who report that they speak English less than “very well” identify as Asians and Other Pacific Islanders. Developing and disseminating linguistically and culturally appropriate oral health education, messaging and services will be crucial to achieving optimal oral health for these residents.”

#### *Barriers and Facilitators to Integration*

A number of barriers became evident to IHN-CCO regarding differences in the medical and dental processes and where dental offices need to be better aligned to the medical practices. As

the Final report and Evaluation for the Diabetes pilot said, a “barrier that presented throughout the life of the pilot that deserves further discussion is the closed loop referral (to dental). All of the medical clinics voiced concern that after a referral was made there was no correspondent communication to inform the medical provider if that member was seen, by whom, and what for. A correspondence log was trialed for a brief period of the second year, however due to limited employee resources ...this pathway did not allow for direct communication between the primary care provider and the primary care dentist. This goal was never achieved during the life of the pilot leaving a major barrier to the quality of care for the IHN-CCO population.”

Providing Continuing Education about the different clinical areas has also been a challenge to integration. Providers were informed about the online SFL program via the Provider News, but there is little evidence that providers have the time to study the Oral Health curriculum themselves. The lack of operability of the various discipline-specific EHR systems was a barrier, but was offset by the forethought that IHN-CCO had in investing in some regional Health IT for some of the functions. The willingness of all involved is a definite facilitator to successful integration. And, the State requirement to have comprehensive integration of medical, behavioral, oral and social services is a strong facilitator.

#### *Future plans on Integration.*

According to IHN-CCO, they are talking about the next steps for the future. They have gotten lots of good ideas. Getting the Samaritan Medical group to invite Dental to their meetings is on the list.

They also plan to build on the diabetes pilot. Going forward, Willamette has loaded the data of all of their diabetic patients and mapped it to the top 5 medical offices. Together, medical and dental are talking about what template documents they might need, showing A1c levels and periodontal risk, to enable the care coordinators to educate diabetic patients as they come in. They also discussed the possibility of heart disease and severe persistent mental illness as other possible valuable topics for integration. System-wide, performance metrics will continue to tighten each year, and new pilots will be needed to hit the targets.

#### Summary

Oregon Oral Health Reform has been in existence for just over the last two years since the oral health funding stream became the responsibility of the CCOs, with full integration not yet achieved. Key to these efforts is the continued push to better integrate and improve coordination for all aspects of care. Although behavioral health integration has been a more prominent focus to date, there is a growing recognition that oral health integration and improvements in oral health quality and outcomes are also critical to achieving the triple aim of better health, better care, and better outcomes (HMA, 2016).

According to HMA, “The environmental scan and interviews conducted in Oregon did not uncover a clear consensus on what defines oral health integration. The question was asked in interviews with both internal and external stakeholders. The responses varied depending on the role or organization queried, with clinical external stakeholders” (HMA, 2016).

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## Recommendations and Discussion

Based on findings from our environmental scan of reported clinical integration services and guidelines, existing integration examples, professional education and case studies, we make the following 21 recommendations on integration of oral health, primary care and health literacy. We have considered all dimensions of the Modified Rainbow Model of Integrated Care (M-RMIC) in making our recommendations. We anticipate that these recommendations will help guide the selection of individuals and groups needed to inform a more in-depth assessment of oral health and primary care integration, and further the advancement of integration in the United States.

### AN INTEGRATION FRAMEWORK FOR ORAL HEALTH AND PRIMARY CARE

- 1. Apply a comprehensive framework for the integration of oral health and primary care into practice, education, research, and policymaking.*

Integration of oral health and primary care is in the early stages of development. Thus far, efforts to integrate the two are based either on a framework with a limited number of integration dimensions or none at all. Some reports in the peer-reviewed and grey literature have used some variation of the IOM continuum of care model (e.g., full segregation, linkage, co-ordination, full integration), which measures strength or closeness of relationships. Others are limited to clinical competencies. Generation of the knowledge needed to improve integration has been constrained by the lack of consideration of a comprehensive framework or conceptual model that includes integration theory, oral health, primary care, and health literacy.

We have modified one comprehensive framework with six levels (clinical, professional, organizational, system, functional, normative) that worked well in this environmental scan, particularly in collecting and reporting information about the case studies. Further testing of this framework, the M-RMIC, and its applications to practice, education, research and policy are important to advance understanding of integration of oral health and primary care.

2. *Incorporate oral health literacy principles at all levels in an integration framework on oral health and primary care.*

Health literacy is an essential component of all dimensions of effective integration efforts. Patients need exposure to consistent and accurate messages in multiple settings and styles. Primary care practice must support patient understanding with clear and repetitive messages. The organization must provide leadership in promoting use of evidence-based provider guidelines and training in clear communication. Written materials should be in plain language. Our review of surveys for reported preventive oral health services (POHS) delivered by physicians and preventive health services (PHS) by dentists, and existing integration models revealed little mention of health literacy. Most reported activities were limited to patient education during clinical encounters. Interviews during case studies revealed greater attention to health literacy and general support and understanding of the basic concepts. Our findings might be due partly to authors of published studies not thinking about the role of health literacy in integration of oral health into primary care. Several models linking health literacy practices to the Patient-Center Medical Home recently have been published (Batterham et al., 2016; Koh et al., 2013; McCormack et al., 2017; Ridpath et al., 2012). The relevance of these papers to the integration of oral health and primary care is not tested.

ACTIVITIES TO PROMOTE INTEGRATION of ORAL HEALTH AND PRIMARY CARE AND THE INCLUSION OF HEALTH LITERACY INTO PRACTICE AND EDUCATION

3. *Develop implementation guides for integration of oral health and primary care that consider all six levels of integration and include evidence-based or best-practice health literacy protocols.*

A number of guides are available, primarily in the grey literature or web-only access, that provide “how to” instructions and tools for implementing oral health-primary care integration models. These documents focus largely on the integration of POHS into pediatric care at the clinical level. Most do not consider evidence-based or best-practice based oral health literacy practices at any level of integration. Implementation guides also are available for the integration of health literacy practices into primary care. The best known of these is the AHRQ Health Literacy Universal Precautions Toolkit (Brega et al., 2015), which provides extensive guidance and support tools for primary care. A comparable toolkit is not available for dentistry and the relevance of the AHRQ recommended strategies to the dental office setting are untested. Attention to health literacy practices at all levels of the M-RMIC is considered important in patient outcomes. These toolkits and best practices should be

updated for application to dental practice and education and incorporated into all health professions education curricula.

4. *Charge an existing or newly appointed professional or governmental body with the on-going review of non-traditional preventive health services for use in dental practice and education and the development of evidence-based recommendations for their incorporation.*

We found very few clinical practice guidelines or consensus statements for dental professionals on the integration of PHS into clinical dental practice. Yet our review found a growing number of opinion pieces, as well as feasibility and acceptability studies for in-office screening of body mass index, A1c, hypocholesteremia, HIV and HPV (Giddon et al., 2013; Pollack et al., 2014). State licensure boards in New Jersey and New York have ruled that dentists can test for A1c and HIV, but must have effective referral systems in place. Currently, none of these tests when performed in a dental office are considered the standard of care. Resources about how these tests should be used or results communicated to patients and the medical care system generally are not available and should be developed. Once available, they should be disseminated and included in dental education and continuing education programs

5. *Prioritize oral health promotion and disease prevention in integration activities to help reduce disparities.*

Millions of Americans lack access to oral health care, particularly populations from lower income groups. The IOM (2011) envisions a country where everyone has access to quality dental care in a variety of settings that prioritizes disease prevention and oral health promotion. The IOM (2011) further concluded that: "...interprofessional, team-based care has the potential to improve care-coordination, patient outcomes and produce cost savings...". Addressing social determinants to reduce health disparities has long been recognized. The importance of health professionals considering and even intervening with these determinants has only recently been advocated. Indeed, the statewide Medicaid reform in Oregon mandates it. Moving upstream to provide coordinated and integrated oral health and general health promotion and disease prevention efforts can help reduce disparities.

6. *Call on CMS and other funders of integration activities to provide adequate infrastructure and financial resources to implement and sustain different integration models.*

The diffusion and implementation of POHS in medical practices in most states have been slow and the coordination between physicians and dentists necessary for continuity of care difficult to establish. Some of the other types of integration approaches have been implemented as small demonstration projects and are difficult to sustain and disseminate.

These findings suggest the need for a well-established infrastructure that provides technical and financial support coordinated by a designated group with knowledge about the practice of medicine, dentistry, and in the case of those integration efforts expanded to include community programs, public health. The IMB and Willamette case studies highlight the importance of an adequate infrastructure in treating patients enrolled in Medicaid. The IMB program relies on a project coordinator, employed by the state dental public health program, who manages required training of providers and the continuing education application process, and monitors new scientific information for needed modifications in provider training. She also recommends patient education materials that are appropriate for low-literacy patients. The Coordinated Care Organization (CCO) associated with the Willamette Dental Organization employs a population integration manager who develops pilot programs on integration among other duties. Successful implementation of integration of medicine and dentistry is challenging, and requires adequate resources and one or more individuals who provide oversight to be successful. CMS has initiated the Accountable Health Communities initiative in which social service needs of Medicare and Medicaid beneficiaries are addressed to help reduce healthcare costs. Investigation of cost and infrastructure needs should be examined as part of this initiative and then applied prospectively (Alley et al., 2016).

- 7. Identify a minimum set of essential oral health and oral health literacy items for Integrated-Electronic Health Records (EHR) and require their inclusion in commercial health information management software systems available for patient care settings and health professional educational institutions.*

The trend in primary health care is toward the integration of individual medical practices into larger systems with fully integrated electronic medical information accessible to the provider and to patients through portals. Some movement toward group practices can be seen in dentistry, but for the most part and in most states, dental practices remain small, individual practices without electronic records connected to the larger healthcare system. Few commercial EHRs used in the medical setting provide the capability to record information about individual risk factors for dental disease, risk classification, disease status, referral recommendations or their monitoring. Nor are they connected to dental practices. Select systems exist but the technical infrastructure currently in use in most private medical and/or dental groups and practices does not support electronic integration of medicine and dentistry, requiring that an entirely new infrastructure be established in individual communities for linkages to be established with dentists. Primary care physicians performing POHS need to be able to use the same routine for oral health screening and referral processes as they do with other medical conditions.

EHRs used in predoctoral dental and other health profession education are usually not interoperable, even if in the same university, although these connections are beginning to be

explored. Ways are needed to make these communication systems compatible for sharing a patient's medical and dental history, treatment planned and provided, appointments needed, and monitoring health outcomes. Compatible electronic systems across disciplines are needed to facilitate referrals and scheduling appointments.

8. *Explore best ways to establish formal collaboration and referral networks among healthcare systems, medical practices and dental practices within local regions.*

Whether through private or public payers, health departments, local professional associations, or new umbrella or liaison organizations, mechanisms need to be established to formally connect primary care practices with dental practices willing to accept their patients. Primary care educational programs not co-located with a dental school or hospital dental department, need a network for referring patients identified as needing dental care.

9. *Increase the amount of time and resources devoted to oral health in non-dental undergraduate, predoctoral and postdoctoral health profession education programs to enhance clinical integration. Reciprocally, include screening tests for chronic conditions in dental education as the evidence for positive outcomes when used by dental professionals becomes available. Understanding the roles of social service agencies should be part of health profession education.*

More primary care health professional learners are likely to receive some information about oral health as part of their training than in the past, but the amount of time devoted to oral health is still minimal, often only a couple of hours. In addition to oral health topics, opportunity to learn clinical skills such as oral health screening added to the physical exam (HEENOT) and fluoride varnish application is recommended (Haber et al., 2015). Similarly, clinical education of the use of preventive health services is not a routine part of dental education, and community engagement and an understanding of the services provided by social service agencies and their roles in improving health literacy should be part of all pre- and post-doctoral health profession education.

To implement this recommendation, appropriate best education practices need to be determined to advance the knowledge, skills, attitudes and clinical competencies of dental and non-dental learners and providers (students, residents, practitioners, educators).

- 10. Encourage academic and professional dental organizations to partner with non-dental academic and professional organizations to provide education and continuing education opportunities to enhance professional and organizational integration.*

Health profession schools are embracing IPE but they do not always include dental education. Several primary care professional associations have oral health initiatives and are advancing incorporation of oral health as part of comprehensive care, but these educational activities are less prominent among dental organizations. More opportunities should be developed for dental and non-dental academic and professional organizations to jointly provide educational opportunities for oral health and primary care professionals to learn together to provide collaborative, team-based care. These collaborative learning opportunities should include attention to oral health. CE providers should offer joint accreditation available for dental CE as well as CME and other types of CE for other health professions.

- 11. Continue the development, promotion, dissemination and evaluation of oral health curricula in a variety of educational formats in order to facilitate integration of oral health and primary care.*

Smiles for Life (SFL) has shown the need for an oral health curriculum and has favorable acceptance by a variety of health professional organizations and educational programs. Increasing oral health activities in clinical practice and educational programs of pre- and post-licensure health professions calls for a variety of educational formats. Hybrid educational activities that include online curricula and in-person components as part of IPE and IPCP should be encouraged. Additional topics such as health literacy and quality improvement should be added for maintenance of certification and continuing education credit. Formal evaluations of educational programs should assess changes in provider behavior and patient health outcomes as well as changes in knowledge and skills.

## RESEARCH AND REPORTING

- 12. Develop and promote use of guidelines to encourage application of common terminology in reporting the results of integration studies and demonstration programs.*

The literature on integration was described a number of years ago as a hodgepodge of “...vague and confusing terms and concepts...akin to the biblical Tower of Babel.” (Kodner and Spreeuwenbert, 2002). This description seems to apply to the present-day literature on dental-medical integration, which is reporting early experiences with integration models. Inconsistencies in reporting lead to difficulties in synthesizing the literature and unnecessary gaps in our knowledge base on integration. The scientific community has dealt with this

issue in other disciplines through the use of reporting guidelines for different types of studies (e.g., Preferred Reporting Items for Systematic Reviews and Meta-Analyses [PRISMA] and Consolidated Standards of Reporting Trials [CONSORT]). Comprehensive models with clearly-defined terms and concepts, and reporting guidelines for dental-medical integration should help facilitate our understanding of best practices as we move forward with integration activities.

*13. Develop and refine quality of care metrics that include health literacy to measure the degree of integration of oral health and primary care along with other aspects of quality of care.*

Performance measures for dentistry are under-developed and rarely used in quality improvement efforts. The Dental Quality Alliance recommends 12 program-level metrics for any dental use, preventive services use, continuity of care and efficiency, all for children using Medicaid services. None of these metrics specifically relate to the integration of oral health and primary care. The long-standing Into the Mouths of Babes program in North Carolina designed to integrate preventive oral health services into primary care practices for children enrolled in Medicaid has separate performance indicators for medicine and dentistry, when a single measure used in both settings would be most helpful. Consideration should be given to patient- and provider-reported measures among other sources of information specific for dental disease and chronic diseases. DeWalt and McNeill (2013) have presented examples of performance measures that focus on health literacy in an IOM discussion paper.

*14. Encourage the conduct of studies of the impact of health literacy on integration of POHS into primary care and PHS into dentistry using a comprehensive framework.*

Information on health literacy was scarce in our environmental scan of published surveys of physicians' and dentists' clinical integration services and in published integration models. Health literacy was mentioned specifically in only a few published studies, and then only briefly and in reference to patient education materials. When defined more broadly, health literacy practices were found to be more prominent, and they were clearly evident in the case studies. Most of the information in the case studies, however, resulted from our interview queries about the role of health literacy in their integration activities. This observation leads us to believe that the published literature might underestimate health literacy practices. A comprehensive national survey using mixed methods for primary data collection could provide more accurate estimates of integration practices and the extent to which health literacy is a part of those practices.

The role of health literacy in the integration of oral health and primary care is not well defined. We propose one model in this report on how health literacy might apply to the integration of oral health into primary care. The model is based on a limited amount of



published literature and has not been validated. Studies have not investigated the causal links between health literacy and the successful integration of oral health into primary care.

*15. Evaluate integration strategies and oral and physical health outcomes for patients obtaining POHS from non-dental providers or PHS from dental providers.*

A large number of studies have examined the association between oral health and systemic health, thus providing the biological rationale for integration of medicine and dentistry, and a few feasibility and acceptability studies have been done for some conditions and provider types. Preliminary investigations suggest that treatment of dental disease might result in savings in medical care (Nasseh et al., 2014). They also suggest that integration of oral health into primary care might be cost effective (Stearns et al., 2012). Yet, the appropriateness of integration models, implementation strategies, their costs and effectiveness in improving oral health and general health are largely unknown.

We found the reported provision of POHS or PHS to be highly variable but on average low. In general, intervention strategies to promote integration of medicine and dentistry have not been evaluated. The early stage of integration of oral health into primary care provides an excellent opportunity for the application of implementation science to test dissemination and implementation strategies.

*16. Reporting of research including case studies and demonstration programs on dental-medical integration should follow a recommended protocol, which includes a statement of clear goals and purposes for the study, methods in sufficient detail to assess bias, findings and their significance for integration practices.*

Increased research regarding integration of oral health and primary care is critical. Qualitative research plays an important role in understanding and implementing integration of oral health and primary care. It can be particularly valuable in understanding barriers and facilitators to adoption and implementation of POHS by physicians and PHS by dentists. Quantitative research must follow to determine the integration models that improve not only integration, but also oral and general health. The published cases on integration of medicine and dentistry found in our environmental scan are highly variable in their methods, rigor, content and length. More importantly, little attention is paid to including changes in provider behavior, patient satisfaction, health and economic outcome assessment, making it difficult to compare or to draw conclusions about experiences with different integration models.

*17. Establish a searchable repository for storing digital resources (peer-reviewed and grey literature publications on integration programs, clinical practice guidelines, consensus*



*statements on practices, implementation guides and related documents, educational materials) on integrating oral health and general health.*

According to Koder (2009) there is no single approach to integrating health services, organizations or services. Integration depends on a tailor-made combination of structures, processes and techniques to address unique patient needs and system-institutional community circumstances. The dental landscape is changing rapidly with increases in group practices, use of electronic dental records, an increase in community clinics and new workforce models. Changes in medical care are happening even more rapidly. Integration efforts are increasing while these changes in the medical and dental care systems are occurring. As expected, these environmental circumstances have led to local efforts that differ in their approaches to integration. These many models from around the country need monitoring to provide the best opportunities for learning from everyone's experiences.

As integration activities multiply, it would be helpful for presentations, webinars and other relevant but fleeting educational materials and documents describing these activities to be archived and accessible, enduring material for other learners, educators and researchers to use at another time.

Prototypes for implementing this recommendation exist (Pechacek et al., 2015). For example, the integration of oral health and primary care could be a more visible part of the National Center for Interprofessional Practice and Education Resource Center (<https://nexusipe.org/informing/resource-center>) or the recently funded Center for Oral Health Systems Integration and Improvement at Georgetown University. (<http://www.ada.org/en/publications/ada-news/2017-archive/june/dqa-to-address-oral-health-needs-of-children-pregnant-women>). Such a resource center for oral health-medical integration needs to include all target populations and professions.

*18. Give priority to research and demonstration programs on integration of oral health into primary care and to the development of effective linkages between dentists and physicians in private practices.*

More than 90% of dental practices in the United States are privately owned, solo practices with no formal ties to each other or to the health care system (ADA, 2012). Successful integration of nontraditional screening and testing into medical and dental practices requires referrals from physicians to dentists and dentists to physicians based on screening results. We found the reported frequency of referrals to be low, provider dissatisfaction to be high and effectiveness generally unknown for most conditions. Further, successful referrals depend heavily on the navigation skills of patients, particularly for those enrolled in Medicaid and with low literacy. Little research has been done on referral practice patterns or

their effectiveness. We found no comprehensive consensus statements or implementation guides providing guidance, particularly for dentists.

*19. Explore the development and use of Big Data to determine the impact of integration such as the effect of oral health services on general health outcomes and cost.*

The potential exists for improvements in the nation's oral and general health at reduced overall costs through the integration of oral health and primary care. Initial studies on treatment of periodontal disease and reduced costs of medical care for chronic conditions are encouraging. These opportunities and integration strategies for improved population health need study, but require large samples of diverse populations that are not feasible with primary data collection in studies such as randomized controlled trials. Pragmatic trials using large, complex files from multiple sources like enrollment and payment claims files from commercial and public insurance plans can contribute to our knowledge about the impact of integration. These studies require metrics that measure outcomes for integrated care.

*20. Conduct research to determine the best education and continuing education practices that will lead to non-dental provider changes in their clinical practice and integration of oral health in their health care delivery.*

Currently, there is very little information about how providing oral health education to pre-licensure or post-licensure health professionals, either as uni-professional or interprofessional education, affects integration of oral health into clinical practice behaviors or patient health outcomes.

*21. Commission a review to compare state practice acts, laws, regulations, and policies to identify provisions that might hinder integration of oral health and primary care and propose and encourage model legislation and CMS requirements that could be used to remove workforce barriers.*

The integration of oral health and primary care has emerged largely in the last decade. The first model was implemented in pediatrics, which started around 2000 and integrated preventive oral health services into primary care. State medical practice acts generally allow physicians, physician assistants, and nurses to provide these preventive services. More innovative and transformative models such as systems change described in the Willamette case study, co-location of dental providers in medical settings as described in the Grace Health case study or use of dental therapists described in the HealthPartners case study are not options in some states because of provisions in state rules and regulations.

## SUMMARY

Integration of oral health and primary care is in its infancy. A number of initiatives with different models have emerged across the country, yet significant work in the area, particularly in generating outcomes is just beginning. With all the ongoing activity, the integration of oral health and whole body health and well-being shows signs of becoming a specialized thematic area within dentistry.

Much work remains in educating the current and future workforce, including the need for the development of various health professions education programs that incorporate didactic knowledge of integration and participation in team-based care. Graduates need to be prepared to assume positions in an integrated healthcare system. Similar needs for continuing education programs are required to inform the existing workforce.

New oral health and primary care integrated practice models need to be refined and thoroughly tested for successful programs to become commonplace. Workforce models that are flexible and can be applied in settings with a paucity of healthcare providers are required and will need examination and advocacy to change regulations that impede the provision of oral health care to all Americans. Increasing efforts in developing a common terminology, shared electronic health records, enhanced communication and networks across professions for patient referrals and team-based care are all required. Research, especially that pertaining to patient outcomes, and best practices for appropriate infrastructure, resources, coordination, and oversight are also needed. Among the highest priorities is the need to have funding and national champions who will advance the coordination of the movement to integrate oral health and primary care, with what to date has been largely a separate movement, to promote oral health literacy practices in medicine and dentistry.

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