



# Bridging the dental-medical divide

## Case studies integrating oral health care and primary health care

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### ABSTRACT

**Background.** The National Academies of Sciences, Engineering, and Medicine commissioned an environmental scan describing the status of health care integration of oral health and primary care services.

**Methods.** The authors conducted an environmental scan of US integration activities with publications from January 2000 through August 2017. They categorized services as preventive oral health services (POHS) provided by medical care providers, POHS provided by dental providers in nondental settings, preventive health services provided by dental providers, or care coordination using dedicated personnel and technology. The authors chose 4 programs as case studies and interviewed key personnel in each program. One case study illustrates each category of integrated services; additional examples describe category variation.

**Results.** The case study involving Into the Mouth of Babes illustrates medical professionals delivering POHS to children. The case study involving Grace Health presents dental hygienists embedded in the obstetrics-gynecology clinic to provide oral screening, prophylaxis, and education to pregnant women. At HealthPartners, medical care providers refer patients with diabetes to dentists and waive copays for periodontal care. The InterCommunity Health Network Coordinated Care Organization uses dedicated patient coordinators, technology, and coordinated payment and referral mechanisms to facilitate care.

**Conclusions.** Integration of dental and medical care increased access to and coordination of patient care by means of offering health care services traditionally provided by the other profession.

**Practical Implications.** Integration models demonstrate the incorporation of POHS by primary care professionals, the embedding of dental professionals into primary care clinics, and the incorporation of care coordination to increase the delivery of oral health care. Similarly, dentists identify and refer patients with medical needs or preventive gaps to medical homes.

**Key Words.** Oral health; health promotion; primary health care; preventive dentistry; health care systems; oral health care; dental hygienists; interprofessional relations; diabetes; dental team.

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The US medical and dental professions operate in parallel, with largely nonintersecting education, finance, and delivery systems.<sup>1</sup> Both provide health promotion, disease prevention, routine services, and emergency care to their patients. Dentists focus on the oral cavity, and primary care providers, such as family physicians, are the first contact who coordinate continuing care for the rest of the body. When necessary, each might consult the other type of provider for information to help determine appropriate treatment or refer as needed. The lack of infrastructure, technology, and personnel to connect these separate systems leaves it to the public to navigate across the dental-medical divide on their own, often without the necessary health literacy skills or resources. Increasingly, well-known inequities in access to essential health services and poor health are attributed to these independently functioning dental and medical care systems and missed opportunities to provide services.

There are many reasons why professional organizations and policy makers are realizing that interprofessional collaboration is a better way to provide whole-person health care and are leading the charge toward integration. They include the following:

- Our understanding of the common risk factors and strong biological relationships between what occurs in the mouth and the rest of the body increasingly indicates a need to better incorporate oral health care into patient care.<sup>2</sup>
- Integration can reduce the overall cost of health care. Nasseh and colleagues<sup>3</sup> reported that screening for chronic diseases in dental offices could decrease US health care costs by \$102.6 million dollars annually. A modeling analysis estimated that over a 10-year period, a savings of \$63.5 billion in health care costs could be accrued, largely in fewer hospitalizations and emergency department visits, by means of covering periodontal treatment for Medicare beneficiaries with diabetes, coronary artery disease, and cerebrovascular stroke.<sup>4</sup>
- Studies indicate that the maldistribution of dental and primary health care professionals that results in medical health care professional shortage areas and dental health care professional shortage areas presents access-to-care issues that do not always coincide.<sup>5</sup> There are many vulnerable population groups with untreated oral disease that obtain medical care but not oral health care. An estimated 108 million people each year see a physician but not a dentist; conversely, 27 million people each year have a dental visit but no medical visit.<sup>6</sup> Some in this latter category may have undiagnosed medical conditions such as diabetes or hypertension that could be identified in dental offices.
- Patients with dental problems are increasingly seen in hospital emergency departments.<sup>7</sup> Improved access to oral health care and cross-training of physicians to treat dental emergencies could help prevent patients from receiving expensive, nondefinitive care that leads to other health crises.

Governmental, philanthropic, and professional organizations, bolstered by preliminary research and demonstration findings, have subsequently added support for integration of dentistry and primary care.<sup>8-11</sup> On the basis of concern regarding the existing voids in knowledge and understanding of integration, the National Academies of Sciences, Engineering, and Medicine (NASEM) Roundtable on Health Literacy commissioned a review of the literature on integration of oral health into primary care and the development of 4 case studies on integration of oral health into primary care. In this article, we briefly describe the resulting environmental scan, the types of integration efforts that medical and dental primary care delivery systems are embracing, and 4 major types of medical-dental integration through the case studies.

## METHODS

An environmental scan is a methodology that can be used to gather a broad amount of information about a topic, from both peer-reviewed and gray literature. Gray literature is “information produced on all levels of government, academia, business and industry in electronic and print formats not controlled by commercial publishing,” that is when “publishing is not the primary activity of the producing body.”<sup>12</sup> The methods for the environmental scan are published in detail and are described briefly here.<sup>13</sup>

## Sources of information

Inclusion criteria for our literature search were English-language publications from January 2000 through August 2017 describing oral health-primary care integration activities conducted in the United States. We also contacted content experts and posted an announcement on a dental public health listserv and a health literacy listserv to advise people of the environmental scan and ask them to refer any not-yet published descriptions of programs to us. We reviewed Web sites of foundations and governmental agencies that fund programs to look for reports and program announcements.

We categorized the examples we found into the following 4 integration categories according to the services provided, who provided the services, and the location:

- preventive oral health services (POHS) provided by medical care providers in their medical clinics;
- POHS provided by dental providers in medical primary care clinics or nontraditional settings;
- preventive (nondental) health services provided by a dental provider in a dental clinic setting;
- care coordination and case management and referral that can be provided in multiple medical, dental, or community settings.<sup>13</sup>

## Case studies

As part of the task from NASEM, we were asked to develop 4 case studies based on innovative integration programs that were ongoing, had performance measures that could demonstrate an impact on the target population, had not been documented in a prior case study, and represented

## ABBREVIATION KEY

|               |                                                            |
|---------------|------------------------------------------------------------|
| <b>FQHC:</b>  | Federally qualified health center.                         |
| <b>FV:</b>    | Fluoride varnish.                                          |
| <b>IMB:</b>   | Into the Mouth of Babies.                                  |
| <b>NASEM:</b> | National Academies of Sciences, Engineering, and Medicine. |
| <b>OB-</b>    | Obstetrician-gynecologist.                                 |
| <b>GYN:</b>   |                                                            |
| <b>POHS:</b>  | Preventive oral health services.                           |

integration of oral health care with primary care at different levels within an organization, from the direct clinical setting to encompassing the entire health care organization.<sup>13</sup>

We reviewed each organization's Web sites and other documents that they provided and then developed a structured interview guide with a set of questions common for each of the 4 case studies. The organization selected the appropriate person to provide the information sought in the interview. The interviews elicited comments about the organization's motivation and process for integration of oral health into primary care; the staff's reaction to, benefit from, and problems with the integration implementation; performance measures; barriers and facilitators for integration; use of health literacy; and plans for the future. We added questions specific to each staff member's role. We sent the interview questions in advance of the interview so that participants would have time to consider the questions and prepare for the interview. Two of the 3 authors (varying upon who was available) conducted the interviews over the telephone for 3 of the case studies and in person for the fourth (North Carolina case study). When selecting from among the available integration options, we strove for variety in geography and type of organizational setting. A draft of the case study was sent to the organization for their review and comment.

In this article, we analyze and present the case studies using the same 4 integration categories used in presenting the results of our literature review in the NASEM report. Selected performance measures for each case study are presented in aggregate in 3 categories: clinical quality, patient experience, and care coordination. We use the overall results of our environmental scan to briefly describe the variability in implementation found within each integration category.

## RESULTS

The environmental scan produced a wide variety of integration examples. We found 11 in the peer-reviewed literature, 13 in the gray literature only, and 2 through our outreach activities. Some examples are located in 1 city, county, or state, whereas others are in multiple states.<sup>13</sup> The case studies include a variety of delivery systems, settings, and populations. Numerous primary care practices participate in the Into the Mouths of Babies (IMB) statewide program in North Carolina. Grace Health is a federally qualified health center (FQHC) in Michigan. HealthPartners is an accountable care organization in Minnesota and Wisconsin. InterCommunity Health Network Coordinated Care Organization in collaboration with Willamette Dental Group is part of the statewide health reform initiative in Oregon. Examples of performance measures used in each case study are shown in the [box](#) and described in more detail with each case narrative.

### POHS provided by medical personnel

The delivery of POHS by primary medical care providers emerged in the late 1990s as 1 strategy to help address national concerns over the high prevalence of caries among low-income children and their limited access to oral health care. This approach is well suited for young pediatric populations because the well-child visit schedule provides multiple opportunities for POHS during the first 3 to 4 years of life.

In case study 1, IMB, a statewide Medicaid program in North Carolina, was among the first of this type of integration model to appear in the United States.<sup>13,14</sup> In this program, trained primary care physicians and other medical care providers, whether in private practices or community clinics, are reimbursed by Medicaid for medical visits in which POHS (oral screenings and risk assessments, counseling of caregivers, dental referrals, and fluoride varnish [FV] applications in young children from the time of tooth eruption to 3½ years of age) are provided.

The goals of the IMB program were and continue to be

- increase access to POHS for low-income children up to 3½ years of age;
- reduce the prevalence of early childhood caries;
- ultimately, increase the health care delivery system's capacity to serve young children.

More than 500 primary medical care practices in North Carolina now bill Medicaid for services provided in more than 160,000 visits every year. POHS are routinely provided during more than 50% of well-child visits by 1- and 2-year-old children enrolled in Medicaid and Children's Health Insurance Program. In 2016, 57.8% of the average of 47,025 well-child visits per quarter received these services.<sup>9</sup>

Almost 2 decades of experience with this integration model in North Carolina suggests that it is sustainable and effective in reducing inequities in access to POHS and poor oral health. Statewide

## Box. Selected examples of dental performance metrics used among the case studies.

### Clinical Quality

- Proportion of well-child visits with preventive oral health service
- Percentage of patients aged 2-21 years with at least 1 dental visit with a dental practitioner
- Dental risk assessment followed by individual care plan for caries and periodontal disease
- Application of fluoride varnish in medical offices to children enrolled in Medicaid
- Receipt of any preventive dental service
- Children who received at least 2 fluoride varnish applications per year
- Percentage of pregnant women who received obstetrical examinations, were referred to the dental department, and obtained a treatment plan

### Patient Experience

- Percentage of patients who receive information from their medical or dental professional that they could understand
- Plan members who report to the physician that they have a dentist
- Percentage of patients who are encouraged to be part of the decision making regarding their care
- Plan members who were able to see a dentist as soon as they wanted in the case of a dental emergency

### Care Coordination

- Proportion of professional oral health services provided in medical and dental offices that are integrated with community programs like Early Head Start
- Percentage of referred pregnant women who seek oral health care as part of prenatal care
- Adult members identified as having diabetes who received at least 1 dental service within the year
- Proportion of children enrolled in Medicaid who are in the targeted age group and received preventive dental care in dental offices
- Percentage of patients with diabetes who are referred to a dentist and who receive periodontal therapy
- Members who were seen in the emergency department for nontraumatic caries-related dental reasons and visited a dentist within 30 days after the emergency department visit
- Identified patients with diabetes receiving referrals from their dental provider to their primary care provider

process performance measures include quarterly reports on visits, the proportion of well-child visits with POHS, and the percentage of children with at least 4 visits before 3½ years of age. Formal evaluation studies measured the performance of the program on its ability to promote early entry into the oral health care system by providing POHS as part of well-child visits for those children in need, plus the follow-up, to measure the percentage of children who have a dental visit (Box). The studies measured the reduction in the amount of caries and thus the need for dental treatment in the Medicaid population statewide and the reduced early childhood hospitalizations for dental disease, which help control costs.<sup>15-19</sup> POHS are considered essential services for the well-child visit by the American Academy of Pediatrics<sup>10</sup> and the US Preventive Services Task Force.<sup>20</sup> Medicaid reimbursement for FV applied to the teeth of young children by medical care providers is now available in all 50 states, as well as from some private insurers.<sup>21</sup>

Other integration examples of POHS serving young children discovered in our environmental scan included community agencies that identified and referred at-risk children to participating medical and dental providers<sup>22</sup> and programs focusing on increasing dental services to young children provided by safety net community clinics<sup>23</sup> and FQHCs.<sup>24</sup> Integration of POHS within medical practices also expanded to serve other population groups, including pregnant women,<sup>25</sup> and specific disease categories such as HIV patients and adults with diabetes with a glycosylated hemoglobin level greater than 9.<sup>26</sup>

### POHS provided by dental personnel in nontraditional settings

Another integration strategy to increase the likelihood of patients receiving POHS is to embed dental personnel where people are receiving medical services.

In case study 2 at Michigan's Grace Health, a nonprofit FQHC with both medical and dental clinics, the chief operating officer, a former dental hygienist, thought the obstetrics-gynecology

(OB-GYN) facility could be an excellent place to integrate an oral health program for women alongside their prenatal care.<sup>13</sup> With special certification as part of the state's Public Dental Prevention Program, Grace Health hygienists can provide preventive services with indirect supervision from Grace Health dentists. An operatory for the hygienists was incorporated into the OB-GYN suite. The program's goals are to benefit the pregnant woman's oral health, address oral infections that could potentially lead to poor birth outcomes, and improve the oral health of the future baby and any siblings.

This program includes a dental hygienist visit for each woman at least once per trimester during pregnancy and once postpartum. The first-trimester visit occurs in the OB-GYN suite for a dental screening, prophylaxis, and review of home-care practices. Women without a dental home or needing urgent oral health care are scheduled in the Grace Health dental clinic or provided with names of local dentists. Subsequent visits in the OB-GYN suite follow up on the patient's dental treatment needs and involve discussion of oral hygiene, how nutrition affects her and her children's oral health, baby and infant oral health care, and the importance of the well-child visit at age 1 year. The postpartum visit assesses how the mother is doing, provides a finger brush and a book on dental health, and reinforces the need for an age 1 well-child dental visit. Performance measures included the percentage of pregnant women who completed the program; 62% of the first 605 women went to the dental department and obtained a treatment plan (Box). Of those who did not, 39% had commercial dental insurance so may have had a different dental home or would be referred to one because Grace Health only accepts patients enrolled in Medicaid or who are eligible for the sliding-fee scale.

As this Michigan infant oral health program took hold, the Grace Health pediatrics team began to add oral health care to their program and invite the dental hygienist to see children aged 9 to 12 months for the first baby dental visit, including a dental screening, caries risk assessment, and FV. Children with no dental home are registered so the clinic can track their health. The dental hygienists also trained the medical assistants to provide FV.<sup>13</sup>

Other examples of embedding dental hygienists in nondental clinics were seen in the literature. In the Colorado Medical-Dental Integration Project, independent-practice hygienists are co-located in FQHCs, not-for-profit medical practices and private pediatric practices, school-based health clinics, and other settings for underserved populations.<sup>27</sup> Similarly, Pennsylvania expanded the use of dental hygienists in diabetic clinics<sup>28</sup>; New Mexico emphasized hygienists' services for people with diabetes, children, pregnant women, and patients with cardiovascular disease.<sup>29,30</sup> In some settings, a clinical assistant rather than a dental hygienist is trained to provide the screening, health education, and FV. Addressing the growing problem of dental visits to the emergency department, some communities have explored the embedding of oral health care providers in the emergency department to handle the dental symptoms.<sup>28,31</sup>

### **Preventive health services by dentists**

Although this was not a direct example of integration of oral health into primary care, we also considered the reverse in the environmental scan—dentists who provide preventive health services such as screening for blood pressure and blood glucose levels. We identified a number of such examples.

In case study 3, HealthPartners provides a good example of this bidirectional integration because its integration of medicine and dentistry dates to the founding of the organization 60 years ago. HealthPartners is an accountable care organization in Minnesota serving over 1.2 million medical patients and 500,000 dental patients.<sup>13</sup> It offers medical and dental insurance and provides direct care through their participating and affiliated medical and dental clinics.

Integration efforts at HealthPartners begins with the development and regular updating of clinical practice guidelines by a multidisciplinary team including dentists for conditions such as caries<sup>32</sup> and oral cancer<sup>32</sup> as well as for antibiotic prophylaxis and dealing with the opioid crisis. HealthPartners participated in testing the feasibility of blood glucose screening in the dental clinic.<sup>33</sup> Dentists measure blood pressure in all new and recall-visit patients, a standard part of oral health care. However, at HealthPartners the dentist immediately refers patients with high blood pressure readings to the medical clinic, and appointments are tracked for follow-up. Physicians observed a positive impact among the enrolled patient population when the dentists assumed a more proactive role in referring patients with high blood pressure. Performance measures included

assessing the proportion of patients with diabetes who are encouraged by their physicians to seek oral health care with waived copayments to emphasize HealthPartners' interest in successful periodontal treatment for patients with diabetes (Box). Likewise, HealthPartners measured the proportion of dental patients with diabetes who were asked about recent visits to the primary care provider and encouraged to get care if there had been no visit within a year. The fees lost on the dental side are balanced by the savings in diabetes management resulting from improved patient health. HealthPartners explored a voucher system program to try to educate Medicaid patients who came to the emergency department for nonurgent dental symptoms to come to primary dental clinics for appropriate treatment.

The environmental scan uncovered other examples of similar activities. Dentists have an important role in identifying preventive care gaps such as overdue flu shots, mammograms, and colonoscopies and referring patients for these services to a physician.<sup>31,34-36</sup> Wisconsin's Marshfield Clinic developed a quality metric for periodontal treatment of medical patients with diabetes to track the progress of their referral program and resulting diabetes management.<sup>37</sup>

### Case management and coordination of services

Dedicated personnel and electronic tools help facilitate interprofessional consultation, referral and care coordination, scheduling of patient appointments, and navigation across different health care settings, especially when the patient's health literacy provides challenges. Case managers can also proactively identify patients who need follow-up or preventive services and try to convert episodic or emergency department users to routine care.

In case study 4, multiple examples of the use of dedicated personnel and electronic tools to coordinate care are found in Oregon's statewide effort to transform its Medicaid system. This reform effort includes a comprehensive program to integrate physical, behavioral, and dental health services under 1 global budget through the development of coordinated care organizations.<sup>13</sup> Coordinated care organizations share similarities with accountable care organizations in that the provider groups are held accountable for the quality of care rather than the number and types of services provided.<sup>38</sup>

The InterCommunity Health Network Coordinated Care Organization collaboration with the Willamette Dental Group demonstrates how challenging it can be to implement integration of medical and dental providers belonging to different practices, systems, and clinics to provide an appropriate sequence of care for their shared patients. A diabetes integration pilot program began with an in-person meeting of physicians and dentists to develop a common understanding of the program and to collaborate on development of education materials about diabetes and oral health, followed by a mailing of a brochure to each known patient with diabetes.<sup>39,40</sup> Medical care providers educated their patients about the importance of good oral health for glycemic control and referred them to a dentist if they had not seen a dentist or reported oral pain. Willamette's outreach to their dental practices included explaining the program, providing the educational materials to the dentists, reminding the dentist to ask if the patient had seen his or her medical care provider within a year, and reminding them to make a referral if not. Willamette used their central electronic health record to alert the dental office when a patient with diabetes was scheduled to come in.<sup>13</sup> Performance measures were in place for both directions of the integration, percentage of patients with diabetes who received periodontal therapy and the percentage of identified patients with diabetes who were referred from their dentist to the primary care provider (Box). After examining the 1-year results, the medical and oral health care providers agreed to alter their case management to try to convert the patients with diabetes who received regular medical care but only episodic oral health care to go for regular dental visits. Dental teams approached identified patients with diabetes who had no dental visits and contacted them directly to encourage them to come for dental visits. A similar pilot was developed to integrate the coordination of medical perinatal and maternity care with oral health care.

We saw numerous examples of care coordination and case management in the environmental scan.<sup>13</sup> Organizations used clinical assistants to provide health education, caries risk assessment, and FV applications.<sup>14,22-24,31,35</sup> A dental community clinic sent invitations to parents of newborns to invite them to bring the baby to the dental clinic.<sup>35</sup> Community health workers encouraged people to seek oral health care. Even mental health care professionals joined the oral health message. In Ohio, behavioral health providers offered counseling to families whose children missed dental appointments to strategize how parents could get their children to their dental appointment in time.<sup>41</sup>

## DISCUSSION

There are many ways that collaborations are being developed among dental and medical health care professionals with the goal of improving whole-person care. Integration is needed to bring preventive services to people who have access to medical care but not oral health care or who obtain oral health care but not medical care, for people with chronic diseases needing the care of multiple providers,<sup>42</sup> and for those with low health literacy.<sup>43</sup>

The models described have the goal of increasing access to preventive and ongoing care, with target populations of young children, pregnant women, and people with diabetes or other chronic diseases or urgent dental needs. Dental teams also have a role in referring their patients to appropriate medical services after screening and identifying new conditions, inadequate chronic disease management, or preventive care gaps.

We selected case studies to demonstrate different approaches to integration; the examples we observed in our environmental scan represent the large variation found in implementing each approach to integration. The variability observed in each integration category presented here can be explained by a number of facilitating and limiting factors: scope of state dental practice laws and regulations that permit or forbid oral health care professionals to practice in nontraditional settings or provide nontraditional procedures within dental practice, the availability of compatible and shared electronic health records across professions, the ability of clinical providers and staff to envision changes to the work flow of their care process to add POHS, the difficulties in communicating among stand-alone medical and dental practices, opportunities for nondental professionals to learn about and value oral health, and development of additional clinical practice guidelines and new payment models.<sup>13</sup>

As reported in the *ADA News*, a survey conducted by West Monroe Healthcare indicates that there is likely to be continued convergence of medical and dental plans in the future.<sup>44</sup> In 2017, new Code on Dental Procedures and Nomenclature codes were introduced for dentists to bill for medical consultation (D9311),<sup>45</sup> their involvement in care coordination programs (D9992), motivational interviewing (D9993), and oral health education (D9994). These codes will facilitate integration with primary care professionals. Other facilitators and barriers to integration have been reported in a scoping review in 2017.<sup>46</sup>

The national Healthy People 2020 includes an oral health objective to “increase the proportion of adults who receive preventive interventions in dental offices,” including “the proportion of adults who were tested or referred for glycemic control from a dentist or dental hygienist in the past year.”<sup>47</sup> Surveys of dentists, dental hygienists, primary care providers, and patients have all found that most of these provider and patient groups report that screening for medical conditions by a dentist or oral health provider was very or somewhat important.<sup>48-52</sup> The overall goal of all these initiatives is the Triple Aim<sup>53</sup> of improving the patient experience and population health and reducing health care costs.

## CONCLUSIONS

Despite the wide variation among and the small overall numbers of medical-dental integration models being implemented across the country, interest in interprofessional integration is growing and is likely to continue. The expected roles of the medical and the oral health care teams are likely to continue to expand as the environment becomes more supportive of such integration. A number of challenges and barriers exist that limit both the roles that care team members can assume and integration itself. In addition to the challenges presented from the 4 case studies, other challenges include the low priority assigned to oral health in many organizations, the lack of outcomes research that provides evidence for guidelines and best practices, and the lack of Medicare and, in many states, Medicaid reimbursement for adult dental services.<sup>46</sup> Furthermore, increased emphasis on the development and use of performance measures to assess the actual benefits and costs of various integration models of medical and dental health care is greatly needed.

Health care organizations that have defined, enrolled populations or a specific mission and target population appear to be leaders in efforts toward interprofessional collaborative practice and integrated care. HealthPartner's annual Clinical Indicators Report<sup>54</sup> presents 99 performance measures comparing provider performance on measures of clinical quality, patient experience, and affordability, including 12 Health Effectiveness Data and Information Set measures. Few programs that lack an enrolled population can use such a comprehensive set of performance measures.

There are a number of challenges for independent providers in stand-alone dental offices to initiate some of these integration models, but they can begin by getting to know their health care professional colleagues in informal or formal settings through community-service activities or by inviting them to or coleading interprofessional continuing education opportunities to learn about each other's disciplines. Health care professional societies like the American Dental Association, American Medical Association, and American Academy of Family Medicine should be encouraged to host joint continuing education. Establishing continuing communication, referral, and feedback channels is another important beginning step. Electronic health exchanges are being developed and implemented for sharing health records in a secure environment across different platforms. Dentists and hygienists must be strong advocates and educate their professional colleagues about the importance of oral health as part of whole-person health care for oral health to finally become an integral part of health. ■

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