for assessing the results of multiple studies, but it can't overcome the shortfalls of existing studies or data that have been gathered. Possible causal mechanisms have been suggested and studied, but there exists no definitive evidence that treating oral disease can exert a meaningful effect on the prevention, treatment, or outcomes of any systemic disease. Association does not prove causation.

RECOMMENDATIONS

Dentistry should take a cautious approach to this oral-systemic linkage research. In addition, it's important to remember that the main reason for maintaining good oral health is its importance for the patient's quality of life and health status. Having good oral health benefits the patient by allowing efficient, effective chewing, the enjoyment of food, a pleasing appearance, self-confidence, and freedom from pain and infection, among other things. Poor oral health is associated with many disadvantages that can be avoided by treatment. Just the fact that good oral health can benefit the patient's life should be justification enough to recommend it.

Pihlstrom BL, Hodges JS, Michalowicz B, et al: Promoting oral health care because of its possible effect on systemic disease is premature and may be misleading. *J Am Dent Assoc* 149:401-403, 2018

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PEDIATRIC DENTISTRY

Infant oral health

BACKGROUND

Infant oral health (IOH) has been advocated for many years, but has been slow to be universally accepted by medical and dental professionals. IOH refers to having the child make a first visit to the dentist between ages 6 and 12 months. During this visit, the child is examined and undergoes a dental caries risk assessment. The parents receive preventive instruction, establish a relationship with the dentist (a dental home), and usually have fluoride varnish applied to the child's primary teeth. Although IOH is supported by major dental health associations, it can also be performed by the primary care medical provider (PCP) when a dental referral is not possible. From a public health perspective, IOH is a primary prevention tool similar to well-child visits, where the child undergoes developmental screening, immunizations, and anticipatory guidance. The rationale for IOH, obstacles to its acceptance, its benefits, and its role as a public health tool were discussed.

RATIONALE FOR IOH

One of the major goals of IOH is to identify children at risk for early childhood caries (ECC) so that preventive actions can be taken. Once ECC occurs, it starts a process that can lead to a life-long propensity to develop new caries, so prevention is vital. The evaluation of ECC risk includes an assessment of the child's oral microbiome and his or her diet. ECC occurs when dietary sugars are metabolized by oral bacteria to acids that demineralize tooth structure. More frequent intake of dietary sugars, such as going to bed with a bottle and having regular sugary drinks or snacks between meals, is an important risk factor for caries. Practitioners identify this factor and others that put the child at risk and formulate individualized strategies the family can use to prevent ECC from developing.

IOH also begins the association between the dentist and family, which is termed the dental home. Even when done by the PCP, a well-functioning IOH system should not only assess the child's oral health during well-child visits, but also include a pediatric dentist as the source of treatment when advanced behavior guidance techniques, such as sedation or general anesthesia, are needed to accomplish treatment.

OBSTACLES TO ACCEPTANCE

During the well-child visit, PCPs are generally charged with covering more than 50 policies containing 192 health directives in about 20 minutes. As a result, the addition of oral health assessment is made only when the clinic or practice has made it a priority. Many pediatricians view dental health as a low-priority item and prefer to have dentists address it. Lack of oral health training during medical school, lack of reimbursement for the time spent, and untrained auxiliary staff also serve as obstacles to the institution of IOH during the well-child visit.

For dental practitioners, similar obstacles exist, including lack of IOH training in dental school, inadequate reimbursement by payers, disruption of the normal practice pattern, and a culture of practice where infants are seldom seen. Often dentists and PCPs only offer IOH in the context of an organized promotion, generally motivated by state departments of health, accountable care organizations, payers, or health coalitions.

IOH may become more accepted as interprofessional care options are instituted, which deliver patient care across traditional boundaries. Having both medical and dental services in Federally Qualified Health Centers may enhance the likelihood that a comprehensive care program will also include IOH.

BENEFITS

Little evidence currently exists regarding the actual benefits of IOH because of its lack of penetration into the dental health care scene. Longitudinal studies of both Medicaid-insured and privately insured children suggest that the cost savings related to the care of children who receive early dental visits is considerable compared to peers who do not visit the dentist until later in childhood.

PUBLIC HEALTH ROLE

IOH fits well into the dental public health principles and practice as well as the goals of improved health for populations in the triple aims for health care. The public health aspects of IOH include the engagement of providers across health disciplines, which offers more opportunity for a high impact with minimal intervention; the performance by multilevel personnel, which keeps costs low; both primary disease prevention and early identification of incipient disease, which lower the cost of care; better population health through the improved health literacy and minimal interventions; and an improved health experience by reducing dental disease and its consequences along with low-intensity treatment.

IOH does not require a dental office setting and uses minimal instrumentation, so it can be delivered in various settings. Trained personnel at lower pay levels, such as dental hygienists and expanded function dental assistants, can deliver the service, making it cost-effective. The major therapeutic intervention is fluoride varnish, which is also a low-cost option. Even adding silver diamine fluoride (SDF) and interim therapeutic restorations maintains IOH as a minimally invasive pediatric dental option.

FINANCING

Medicaid is the largest publically funded insurance program that covers health care costs for low-income young children. Its Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) program mandates comprehensive health care for children under age 21 years and includes dental coverage for the relief of pain and infections, restoration of teeth, and maintenance of dental health. Benefits should include all services needed to address oral health conditions, which are delivered in accordance with each state's periodicity schedule. States have adopted schedules that permit reimbursement for early dental intervention. However, just 16 states require referral to a dentist by the time a child reaches age 1 year (Table 2).

Table 2. States With and Without Established Timelines for Dental Referral Under Early and Periodic Screening, Diagnosis, and Treatment

Timeline	State
Referral to a dentist by age 1	California, Colorado*, Georgia, Idaho, Iowa, Massachusetts, Michigan*, Missouri*, Montana*, New York*, Pennsylvania, Rhode Island, Texas, Utah, Vermont, West Virginia
Referral to a dentist by age 2	Connecticut*, Illinois, Indiana, Kentucky, Maryland*, Nevada, Oklahoma, South Carolina*
Referral to a dentist by age 3	Alabama, Alaska*, Arizona, Arkansas*, D.C., Florida*, Hawaii*, Maine, Minnesota, Mississippi, Nebraska, New Jersey, New Mexico*, North Carolina, Ohio*, Tennessee*, Virginia, Washington*, Wisconsin, Wyoming
No established referral timeline	Delaware, Kansas, Louisiana, New Hampshire*, North Dakota, Oregon, South Dakota*

*States with no separate periodicity schedule.
(Courtesy of Casamassimo PS, Hammersmith K, Gross EL, et al: Infant oral health: An emerging dental public health measure. *Dent Clin N Am* 62:235-244, 2018.)

Strategies developed to promote the oral health of young children include the following:

1. Improving state Medicaid program performance by changing policies to align the dental periodicity schedule to clinical recommendations, by reimbursing medical providers for preventive oral health services, by incentivizing dental providers through new payment models, and by addressing data collection problems.
2. Maximizing provider participation by removing administrative burdens and supporting general dentists in undertaking the care of young children.
3. Addressing missed appointments.
4. Partnering with oral health care stakeholders.

In the private insurance market, dental plans are limited in coverage to dental services provided by dental professionals. Usually IOH examinations and fluoride varnish applications are covered by these plans. The Affordable Care Act (ACA) did not expand the penetration of IOH because pediatric oral health

Clinical Significance

Eradicating ECC is likely best achieved through IOH, which applies across all socioeconomic strata, can be implemented by dental and medical services, and is relatively low in cost. It also offers value-added benefits in its improvement of parents' health literacy and extension of better life for the entire family as they implement appropriate oral health behaviors. It has tremendous potential but has been slow to be accepted among health care providers, payers, and policymakers. The future remains an unknown for IOH.

care is classified as a mandated marketplace offering rather than a mandated covered service. Directive legislation is likely to be required to achieve further expansion of IOH in the private sector. Optimistically, IOH may benefit from the movement by public funding sources to pay for performance, episodes of care, and a desire to achieve cost reductions and provide better patient experiences.

Casamassimo PS, Hammersmith K, Gross EL, et al: Infant oral health: An emerging dental public health measure. *Dent Clin N Am* 62:235-244, 2018

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PERIODONTAL DISEASE

Prevalence of periodontitis in US adults

BACKGROUND

A surveillance project to determine the prevalence of periodontitis among adults in the United States was undertaken by the Centers for Disease Control and Prevention and the American Academy of Periodontology (AAP). The CDC/AAP Workgroup formed to conduct this project created periodontitis case definitions based on a full-mouth periodontal examination (FMPE) to ensure the consistency of the definitions. The data were collected in the National Health and Nutrition Examination Survey beginning in 2009 and ending in 2014. The final estimates of periodontitis prevalence among US adults were reported.

METHODS

The 10,683 subjects were dentate adults age 30 years or older from the civilian noninstitutionalized population. Their periodontitis status was evaluated by performing a FMPE at 6 sites per tooth on all teeth except third molars. The analysis included severity of disease related to minimum clinical attachment loss (CAL) and periodontal probing depth (PPD).

RESULTS

The mean age of the population examined periodontally was 50.8 years. About 17% were current smokers, and 9.6% self-reported having diabetes. The mean number of teeth present was 24, with 34.6% of the subjects having a complete 28-tooth dentition. Over half of the sample reported they had visited a dentist in the past 6 months, and 72% reported they used dental floss in the previous 7 days.

Total periodontitis percentage was 42.2%. Of these individuals, 7.8% had severe periodontitis and 34.4% had nonsevere periodontitis, defined as mild or moderate. The prevalence of nonsevere and total (but not severe) periodontitis increased with age. The highest prevalence of periodontitis was found among men, Mexican Americans, adults below 100% of the federal poverty level, current smokers, and those who had reported having diabetes. Prevalence increased with an increased number of missing teeth but did not increase with increasing body mass index (BMI).

Subgroups of individuals who were associated with dental health–related behaviors were evaluated. The prevalence of total periodontitis was highest among adults who didn't use dental floss regularly and increased with increasing duration since the last dental visit. For those who had not seen a dentist within the past year, the prevalence was 54.8%.

A considerable increase in the prevalence of total and moderate periodontitis was seen with increasing age (Figure 1). The prevalence of severe periodontitis remained generally at 15% or less. Ten percent or fewer of adults age 30 to 80 years had mild periodontitis. Age groups were also compared. A comparison of those age 30 through 44 years and those age 65 years or older yielded a prevalence of severe periodontitis that was more than 3-fold higher among Mexican Americans, non-Hispanic blacks, and current smokers. Similar differences, although at a lower prevalence, were shown for nonsmokers. The highest prevalence across all age groups for total periodontitis was consistently found in adults age 65 years or older. The highest prevalence in these comparisons was found for Mexican Americans, non-Hispanic blacks, persons reporting 'other race including multiracial', current smokers, and people who were missing 6 to 27 teeth.

CAL AND PPD ANALYSIS

The mean population CAL was 1.7 mm and increased with increasing age. Approximately 89% of the subjects had 1 or more sites with a CAL of 3 mm or greater. The prevalence of adults with CAL of 3 mm or greater did not vary significantly with age, but the number of sites and teeth per person did.

The prevalence of more severe CAL values was consistently higher in men, Mexican Americans, and non-Hispanic blacks,