VIEWPOINT

The Importance of Oral Health in Comprehensive Health Care

Janice S. Lee, DDS, MD, MS
National Institute of Dental and Craniofacial Research, National Institutes of Health, Bethesda, Maryland.

Martha J. Somerman, DDS, PhD
National Institute of Dental and Craniofacial Research, National Institutes of Health, Bethesda, Maryland.

The importance of oral health as a component of comprehensive health has received well-deserved national attention.[1] A healthy and pain-free mouth supports good nutrition and the ability to sleep and focus at school or work. The physician needs only a medical pen light, tongue blade, and gauze to conduct a concise oral examination that can be instrumental in helping patients to maintain their overall health (see video produced by the National Institute of Dental and Craniofacial Research).[2] A 5-minute oral examination could help physicians not only recognize poor oral health but also detect clues to seemingly unrelated health issues.

The integration of dental and medical health care is critical for people of all ages. The frequency of visits and evaluations by care practitioners tends to vary depending on the age of the patient. Younger patients were seen more often by a pediatrician than by a pediatric dentist,[3] whereas in a US Centers for Disease Control and Prevention (CDC) survey of 35 000 households, patients older than 65 years were almost twice as likely to visit a dentist than see a physician (63% vs 38%, respectively).[4] Patients of all ages will benefit if their physicians and dentists are aware of the important link between oral health and overall health.

> The oral cavity can serve as a useful indicator of health and disease, and a site for diagnostic and therapeutic access and discovery.

Early detection of oral diseases through a comprehensive but concise examination of the oral cavity can lead to timely management of systemic disease and improved quality of life. Examples of oral diseases with potentially debilitating consequences if undetected include oral or pharyngeal cancers (positive or negative for human papillomavirus), mucosal abnormalities that may lead to malignancies, xerostomia (dry mouth), temporomandibular joint disease and pain, extensive dental caries (tooth decay), and severe periodontitis (chronic inflammation of the gum tissue resulting in bone loss around teeth and potential tooth loss). Each of these oral manifestations may be an early indicator of systemic problems or an untoward response to systemic therapies.

For instance, xerostomia may occur among individuals taking antihypertensive medications or opioids or may be a symptom of Sjögren syndrome, a common autoimmune disorder that predominantly affects middle-age women. Extensive dental caries and damaged teeth may be related to methamphetamine use or chronic xerostomia. Pregnancy or untreated diabetes may increase the risk of severe periodontitis. The susceptibility of patients with diabetes to periodontal disease has been carefully studied and is thought to be due to altered neutrophil function and upregulation of proinflammatory cytokines and matrix proteases.[5] These immune-related changes manifest as gingivitis (gum inflammation) and ultimately periodontitis, with irreversible bone and tooth loss if the diabetes is not controlled.

Dental caries is a widespread condition. If untreated, dental caries can lead to severe and costly oral and systemic manifestations. The CDC's National Health and Nutrition Examination Survey, 2011-2012, identified the presence of dental caries in 91% of the adult US population.[6] In the pediatric population, dental caries is the single most common chronic disease of childhood.[7] In addition, overall health care costs continued to increase between 1996 and 2013 for both children[8] and adults.[9] This, coupled with reductions in dental coverage and limited access to routine and preventive dental services, has increased emergency department visits for basic dental services and has disproportionately affected lower socioeconomic and minority groups.[10]

The financial burden of lost days from work due to dental and oral diseases and the expense of care outweigh the costs for prevention. This imbalance is readily seen in osteoradionecrosis of the jaw (ORN), a preventable disease with severe consequences, including poor bone and oral healing, bone necrosis, and fracture after dental trauma such as extraction of nonsalvageable teeth. ORN most often occurs following radiation therapy for oral cancer. Financial costs can be a barrier for access to treatment for ORN, yet appropriate treatment of dental disease prior to radiation therapy can reduce the complications associated with ORN. Oral conditions such as ORN may result in difficulty chewing and poor nutrition, acute or chronic pain, increased risk for opioid dependence, and a decrease in quality of life.

To meet the challenge of widespread dental diseases, oral health examinations should be implemented in multiple venues beyond dental practices and clinics. Physicians have an important role by providing a thorough oral evaluation and referral when warranted (eg, dental treatment prior to radiation therapy for the dental-oral craniofacial region). Federally qualified health centers and accountable care organizations are service delivery models that, with increased attention to coordinated interprofessional care, should help address the challenges of access to care.[10]

Corresponding Author: Janice S. Lee, DDS, MD, MS, National Institute of Dental and Craniofacial Research, 10 Center Dr, 5-2531, MSC 1470, Bethesda, MD 20892 (janice.lee@nih.gov).

Other models are being evaluated, such as the community health worker and increased use of newer technologies like teledentistry. Such practices, which show promise for improving access to care, could be closely coordinated with primary care models to provide the most comprehensive health care possible.

When nondentist health practitioners perform oral examinations, they not only help to improve oral health, they also have the potential to inform researchers of areas needing attention. Interprofessional collaborations between health practitioners and scientists may provide access to tissues, fluids, and cells that will aid biomedical investigations and may ultimately help to improve clinical care. The dental-oral region is a source of readily accessible tissue and saliva samples that can be used for an increasing range of research and diagnostic assays, including DNA for genetic testing (saliva or buccal swabs), salivary levels of constituents often measured in blood (eg, salivary cortisol, viral antibodies and messenger RNA, circulating tumor DNA), stem cells from exfoliated teeth, and microbial analyses (dental plaque, oral swabs).

The oral cavity can serve as a useful indicator of health and disease, and a site for diagnostic and therapeutic access and discovery. The oral cavity has potential as a site for local administration of therapies for both oral and systemic diseases through novel approaches, such as cannulation of the salivary ducts and delivery of aquaporin gene therapy for radiation-induced xerostomia or potential treatment of the sicca complex of Sjögren syndrome. Physicians can help improve oral health and define signs of systemic diseases, while at the same time inform areas that require more research attention. To achieve such goals, clinicians can begin by performing oral health examinations in addition to those routinely performed in dental practices and clinics.

ARTICLE INFORMATION

Published Online: May 3, 2018. doi:10.1001/jama.2017.19777

Conflict of Interest Disclosures: The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none were reported.

Funding/Support: Funding for the video was provided by the National Institute of Dental and Craniofacial Research Intramural Program.

Additional Contributions: We acknowledge the work and effort of Pamela J. Gardner, DMD, and Blake M. Warner, DDS, PhD, MPH, for the associated video demonstrating a concise oral examination.

REFERENCES

1. Institute of Medicine. *Advancing Oral Health in America*. Washington, DC: National Academies Press; 2011.

2. The Concise Oral Exam [video]. https://www.nidcr.nih.gov/research/clinical-director/oral-exam.

3. Dooley D, Moultrie NM, Heckman B, Gansky SA, Potter MB, Walsh MM. Oral health prevention and toddler well-child care: routine integration in a safety net system. *Pediatrics*. 2016;137(1):e20143532.

4. US Centers for Disease Control and Prevention; National Center for Health Statistics. Health, United States, 2016: with chartbook on long-term trends in health: tables 77 and 78. https://www.cdc.gov/nchs/data/hus/hus16.pdf. Accessed January 18, 2018.

5. Wu YY, Xiao E, Graves DT. Diabetes mellitus related bone metabolism and periodontal disease. *Int J Oral Sci*. 2015;7(2):63-72.

6. US Centers for Disease Control and Prevention; National Center for Health Statistics. Data brief 197: dental caries and tooth loss in adults in the United States, 2011-2012. https://www.cdc.gov/nchs/data/databriefs/db197_table.pdf. Accessed January 18, 2018.

7. Bernstein J, Gebel C, Vargas C, et al. Integration of oral health into the well-child visit at federally qualified health centers: study of 6 clinics, August 2014-March 2015. *Prev Chronic Dis*. 2016;13:E58.

8. Bui AL, Dieleman JL, Hamavid H, et al. Spending on children's personal health care in the United States, 1996-2013. *JAMA Pediatr*. 2017;171(2):181-189.

9. Dieleman JL, Baral R, Birger M, et al. US spending on personal health care and public health, 1996-2013. *JAMA*. 2016;316(24):2627-2646.

10. Crall JJ, Pourat N, Inkelas M, Lampron C, Scoville R. Improving the oral health care capacity of federally qualified health centers. *Health Aff (Millwood)*. 2016;35(12):2216-2223.