



Figure 2. Observed, predicted, and projected implant prevalence among adults with missing teeth in the National Health and Nutrition Examination Survey (NHANES) from 1999 to 2016 and projected to 2021 and 2026. Estimates are from survey-weighted multivariable logistic regression models. For projection scenario 1) trend stops: implant prevalence is estimated to be the same average probability estimated by the regression line in 2015–2016; 2) trend continues at the same pace: the slope of the regression line included all years 2000–2016; 3) trend slows: the slope of the regression line included all years excluding 2015–2016; and 4) trend steepens: the slope of the regression line included all years excluding 1999–2000 and 2001–2002. Solid lines represent the estimated prevalence (for 2016 and earlier) and projected prevalence (after 2016), and dashed lines represent the 95% prediction intervals for those estimates. (Courtesy of Elani HW, Starr JR, Da Silva JD, et al: Trends in dental implant use in the U.S., 1999–2016, and projections to 2026. *J Dent Res* 97:1424–1430, 2018.)

implants continues at the current pace, a 17% prevalence could be expected by 2026. Should a steeper trend develop, the prevalence could reach 23% by 2026.

DISCUSSION

The prevalence of dental implants in adults missing at least 1 tooth increased to a large degree between 1999 and 2016. Although it generally occurred throughout all sociodemographic groups, it was slower among those without health insurance and with a high school education or less. Older adults, those between ages 65 and 74 years, had the most pronounced growth in the use of dental implants.

Clinical Significance

The risk of losing teeth among the US population is decreasing, but the population is also aging, which will likely spur an increase in the use of implants for missing teeth. Disparities in sociodemographic characteristics seem likely to influence the growth of implant prevalence. These findings should be used to help in planning for workforce development and for the implant industry so that future demands can be met and to provide for populations who currently do not see implants as an option for replacing missing teeth.

Elani HW, Starr JR, Da Silva JD, et al: Trends in dental implant use in the U.S., 1999–2016, and projections to 2026. *J Dent Res* 97:1424–1430, 2018

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LAW AND ETHICS

Doing what's right



BACKGROUND

Conflicts can occur between what is legal and what is ethical. The American Dental Association Principles of Ethics and Code of Professional Conduct (ADA Code) recognizes the difference between law and ethics and applies each to the behavior of dental professionals.

LAW

Law fulfills a societal role and expresses the minimal societal ethical values. Society is willing to enforce this minimal level through civil judgments or criminal sanctions. Law can be either civil or criminal and can be set at all governmental levels. It is developed through the formal processes of legislation, regulation,

and decisions by courts or agencies. Just as formal procedures exist for creating law, similar processes exist for challenging law and changing law.

Law applies to a wide range of people and exists despite culture, religion, or worldview. As a result, it is by nature general and should be fairly and evenly applied. It is a basic ingredient in the framework of society. People are expected to abide by the law, but ethics reaches beyond this minimal level to a higher plane of behavior.

ETHICS

Ethics is based on well-developed standards of right and wrong that lay out what humans are supposed to do, usually with

respect to rights, obligations, benefits to society, values, fairness, or specific virtues. Honesty, compassion, and loyalty are often involved in ethical standards of conduct.

One's individual ethics can conflict with others' ethics, whether these others are patients, professionals, or peers. In addition, an individual's ethics can conflict with those of a profession. Behaving ethically demands that one has an ability to balance the various interests involved. Thus, ethics is more subjective than law and not as clear-cut in deciding what to do. It's possible to take various actions and still behave ethically because of the facts and circumstances that exist and are relevant to the ethical decision-making process.

As with law, ethics can be developed from numerous sources and often reflects the influence of more than 1 source. These sources can be guidance from institutions, professional societies, how one was raised, culture, or religion. A code of ethics for a profession sets the parameters of the social contract with the public that profession serves and allows the profession to be self-governing and able to maintain the public's trust.

DISCUSSION

It's possible to act within the law but not ethically, just as one can act ethically but be outside the scope of the law. Everyone must balance law and ethics. For a professional, this requires the ability

to consider the short-term and long-term consequences for that person and his or her patients, profession, and society itself. Ethical standards are considered more fundamental than laws because laws may not be ethical. If a law is unethical, individuals should act to change it or engage in conscientious violation or civil disobedience until it is changed.

Clinical Significance

Law defines what you must do to avoid penalties such as fines or imprisonment. Ethics defines what you must do to ensure that there is the most desirable outcome for yourself, your patients, and your profession. Unethical behavior is punished by patients and the public losing trust in the professional and the profession. Professionals such as dentists need to understand the difference between law and ethics and act accordingly.

Elster N, Elliott TC Jr: Commentary: Distinguishing between law and ethics. *J Am Dent Assoc* 149:1005-1006, 2018

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PREVENTIVE DENTISTRY

Preventing caries through oral microbiome manipulation



BACKGROUND

Caries is a non-communicable disease (NCD) that shares risk factors with many other NCDs, especially overweight and diabetes. Despite decades of decline in the number of cases of caries, this disease remains a public health concern worldwide. It cannot be eradicated, but the current efforts to prevent caries and manage patients' oral health to avoid caries are inadequate to significantly reduce the problem. The instability of the oral microbiome appears to play a significant role in the development of caries, with dysbiosis linked to both bacterial acid production and other biological and non-biological factors that can influence caries development. Some of the factors involved are beyond the control of dental professionals, but others can be managed. Some commonly used preventive technologies were reviewed for their ability to affect the composition of the oral microbiome so that a symbiotic homeostasis can be maintained or restored. All of

these methods should be available to the general dental practitioner.

CLINICAL METHODS TO INTERFERE WITH DYSBIOSIS

The most important methods for interfering with dysbiosis related to a patient's lifestyle are reduction in sugar intake and regular oral hygiene (Figure 2). In addition, several biological approaches can be used to restore or maintain a healthy oral microbiome, including using metabolic inhibitors, pH-increasing supplements, salivary enhancement techniques, antibacterial agents, and prebiotics and probiotics to alter the biofilm.

Sugar Reduction

Excessive intake of fermentable carbohydrates is the main driver of caries-related dysbiosis. Commensal bacteria metabolize