

has also issued advisory opinions that offer concrete guidance in the area of provider collaboration.

The FTC supports the key aims of health care reform, and we recognize that collaborative and innovative arrangements among providers can reduce costs, improve quality, and benefit consumers. But these goals are best achieved when there is healthy competition in provider markets

fostering the sort of dynamic, high-quality, and innovative health care that practitioners seek and patients deserve.

The views expressed in this article are those of the author and do not necessarily represent the views of the Federal Trade Commission.

Disclosure forms provided by the author are available with the full text of this article at [NEJM.org](http://NEJM.org).

From the Federal Trade Commission, Washington, DC.

1. A wave of hospital mergers. *New York Times*. August 12, 2013 ([http://www.nytimes.com/interactive/2013/08/13/business/A-Wave-of-Hospital-Mergers.html?\\_r=0](http://www.nytimes.com/interactive/2013/08/13/business/A-Wave-of-Hospital-Mergers.html?_r=0)).
2. Baker LC, Bundorf MK, Royalty AB, Levin Z. Physician practice competition and prices paid by private insurers for office visits. *JAMA* 2014;312:1653-62.
3. Gaynor M, Town R. The impact of hospital consolidation — update. Princeton, NJ: Robert Wood Johnson Foundation, 2012 ([http://www.rwjf.org/content/dam/farm/reports/issue\\_briefs/2012/rwjf73261](http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2012/rwjf73261)).

DOI: 10.1056/NEJMp1408009

Copyright © 2014 Massachusetts Medical Society.

## Integrating Oral and General Health Care

Bruce Donoff, D.M.D., M.D., John E. McDonough, Dr.P.H., M.P.A., and Christine A. Riedy, Ph.D., M.P.H.

During World War II, the U.S. Armed forces faced a surprising obstacle to recruiting sufficient field-ready personnel for the war effort: 10% of potential recruits failed service requirements related to oral health (such as having six opposing teeth), and many who met the requirements had severely compromised teeth that required tremendous resources to repair. So at the end of the war, “many dentists, military officers, political leaders, and others vowed to solve the Nation’s rampant dental problems.”<sup>1</sup> On June 24, 1948, President Harry Truman signed the National Dental Research Act “to improve the dental health of the people of the United States” by establishing the National Institute of Dental Research, now known as the National Institute of Dental and Craniofacial Research (NIDCR).

Yet today, Americans still face serious challenges in oral health that result in lost work and school hours and impose heavy costs on the health care system and society.<sup>2</sup> Furthermore, there

is evidence that coordinating and integrating oral health into medical coverage and care reduces costs, especially for patients with chronic diseases such as diabetes or cardiovascular disease.<sup>3</sup> We believe that it’s time to mobilize once again to improve oral health in the United States, this time in a more fundamental way — by ending medicine’s artificial and harmful separation between the mouth and the rest of the body. New and compelling evidence suggests that in order to prevent disease and improve health, oral health must be a core component of comprehensive health care.

The Surgeon General’s report on oral health in 2000 concluded that oral health problems not only reflect general health conditions; they can exacerbate and sometimes even trigger them.<sup>4</sup> Periodontal inflammation affects diabetes, heart disease, and chronic obstructive pulmonary disease, as well as perinatal health in mothers and infants.<sup>2,4</sup> Investment in oral health improves general health and reduces medical costs.<sup>3</sup> The 2007 case

of Deamonte Driver, a 12-year-old Maryland boy who died when bacteria from an untreated tooth infection spread to his brain, generated sufficient awareness and legislative support that dental coverage for children was included in the federal reauthorization of the Children’s Health Insurance Program (CHIP) in 2009.

Still, 15 years of research, reports, and recommendations addressing the dental–medical divide have resulted in little serious action to address our country’s oral health deficiencies. Although the changes to CHIP have improved access to services for disadvantaged children, we are failing to address the serious oral health needs of adults, even though an increasing percentage of Americans 65 years of age or older have chronic diseases that are affected by poor oral health. Furthermore, disparities in coverage of and access to dental care services result in the imposition of a high-cost burden on hospital emergency departments.<sup>5</sup> We believe that a national effort is needed to integrate oral health

care and medical care, particularly at the primary care level, where dentists and physicians could collaborate in managing the chronic diseases of their common patients.

A reform agenda for the federal government and the states might address two main priorities. First, all health insurance policies — whether provided through Medicare, Medicaid, or private insurance companies — could include coverage for dental care services, regardless of an enrollee's age. Currently, Medicare covers no dental care unless it is provided on an inpatient basis, and then only when the oral health problem was the cause of the hospitalization. Under the Affordable Care Act, Medicaid and private insurance are required to cover dental care for children but not for adults. Meaningful integration and coordination cannot happen when care and services are not paid for.

The second priority is to integrate general medical and dental care in both practice and workforce education. The separation between oral health and systemic health does not serve the needs of patients, who would benefit from efficient communication between their oral health care and primary care providers, including through the use of integrated electronic health records. If truly integrated health homes for patients are to be achieved, dental training programs and practices should interact more effectively — in terms of curriculum, quality improvement, and health information systems — with medical training programs and practices, especially those in primary care, as well as with other health professions. Ideally, dentists and

other oral health professionals would screen their patients for and address general health issues, while physicians and other health professionals assumed appropriate responsibility for their patients' oral health, providing such services as motivational and prevention counseling and perhaps even fluoride varnishing. The U.S. Health Resources and Services Administration has already developed core competencies for interprofessional education that could be applied in this effort (<http://bhpr.hrsa.gov/grants/areahealtheducationcenters/ta/Trainings/materials/ta113corecompetencies.pdf>).

Needed policy changes can be implemented if we educate the public to see oral health disparities and lack of access as health issues as well as economic ones, develop new policy solutions and strategies, and build the necessary political will. Specifically, we would urge dental and medical schools to collaborate in integrating some basic primary care medicine into the dental curriculum and fundamental matters of oral health into physicians' education and training. Accreditation standards for both medical and dental schools have been revised to support some key interprofessional education. We would also encourage the development of more general-practice dental residency programs in existing hospitals, federally qualified health centers, and dental schools to foster true collaborative care. In addition, we would encourage the creation of partnerships among state medical and dental societies to develop educational curricula for emergency department physicians that include management of common oral

health problems, and we believe that referral networks involving emergency departments and dental care providers should be implemented.

On the insurance front, the Surgeon General could convene a conference to advance efforts to integrate medical insurance coverage with dental insurance coverage. Federal and state legislation could be crafted to help extend coverage of and access to dental health care, expand the oral health workforce, and increase funding for dental education and research. The Comprehensive Dental Reform Act of 2013, sponsored by Senator Bernie Sanders (I-VT), is one step in the right direction.

Such legislative solutions will be one of many critical steps. Professionals and communities that are concerned about oral health can raise these issues as part of the national political conversation leading up to the 2016 federal elections — just as the national conversation about health care reform between 2006 and 2008 set the stage for action leading to passage of the Affordable Care Act in 2010.

But it's important to understand the complex nature of the challenge. The 1964 Surgeon General's report on the harmful effects of tobacco use took many years to achieve success. The issue of integrating oral and systemic health highlighted by the oral health report of 2000 is still relatively young. Leaders of national and state dental associations and societies and deans of U.S. schools of dentistry have always played important roles in establishing U.S. oral health policy. Now there is a growing democratization of awareness, and

a national movement that gives a voice to people affected by inequities in coverage and access to dental care is essential.

Of course, the ultimate goal is care, not insurance, but we know that incorporating coverage of oral health into health insurance reduces costs and improves health. Can the economic implications of this evidence lead to change? We believe that we must mobilize, as our predecessors did in the 1940s, to alert Americans to the importance of oral health and to legislate for change.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

From the Office of the Dean (B.D.) and the Departments of Oral and Maxillofacial Surgery (B.D.) and Oral Health Policy and Epidemiology (C.A.R.), Harvard School of Dental Medicine; and the Department of Health Policy and Management, Harvard School of Public Health (J.E.M.) — both in Boston.

1. NIDCR turns sixty. Bethesda, MD: National Institute of Dental and Craniofacial Research, June 24, 2008 (<http://nidcr.nih.gov/Research/ResearchResults/NewsReleases/ArchivedNewsReleases/NewsReleases2008/NIDCRTurns60.htm>).

2. Institute of Medicine, National Research Council. Improving access to oral health care

for vulnerable and underserved populations. Washington, DC: National Academies Press, 2011.

3. Jeffcoat MK, Jeffcoat RL, Gladowski PA, Bramson JB, Blum JJ. Impact of periodontal therapy on general health: evidence from insurance data for five systemic conditions. *Am J Prev Med* 2014;47:166-74.

4. US Department of Health and Human Services. Oral health in America: a report of the Surgeon General. Rockville, MD: Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2000.

5. Lee HH, Lewis CW, Saltzman B, Starks H. Visiting the emergency department for dental problems: trends in utilization, 2001 to 2008. *Am J Public Health* 2012;102(11):e77-e83.

DOI: 10.1056/NEJMp1410824

Copyright © 2014 Massachusetts Medical Society.

## Ebola Vaccine — An Urgent International Priority

Rupa Kanapathipillai, M.D., Ana Maria Henao Restrepo, M.D., Patricia Fast, M.D., Ph.D., David Wood, Ph.D., Christopher Dye, D.Phil., Marie-Paule Kieny, Ph.D., and Vasee Moorthy, B.M., B.Ch., Ph.D.

With the Ebola epidemic in West Africa continuing to grow, the World Health Organization (WHO) convened an urgent meeting on September 29 and 30 to assess the efforts under way to evaluate and produce safe and effective Ebola vaccines as soon as possible.<sup>1</sup> The 70 scientists, public health officials, and representatives from industry and regulatory bodies who gathered in Geneva discussed two vaccine candidates at length — cAd3-EBOV (cAd3), from Glaxo-SmithKline (GSK) and the U.S. National Institute of Allergy and Infectious Diseases (NIAID), and rVSVΔG-EBOV-GP (rVSV), from NewLink Genetics and the Public Health Agency of Canada. Several other vaccine candidates are at earlier, preclinical stages in the development pipeline.

Phase 1 studies of cAd3 have begun in the United States and the

United Kingdom, and researchers plan to begin enrollment for trials of rVSV soon. Both vaccine candidates have demonstrated 100% efficacy in studies in nonhuman primates,<sup>2,3</sup> but how that will translate to human subjects remains unknown. The phase 1 trials of both vaccines use dose-response designs structured to determine the level of humoral and cellular immunity that can be induced. The minimum antibody titer needed to confer protection in humans is unknown. Because of the small numbers of participants in these trials, they will provide data only on common adverse events.

The cAd3 vaccine is being tested in both bivalent (ClinicalTrials.gov number, NCT02231866) and monovalent (NCT02240875) forms; the monovalent form is based on the Zaire strain of Ebola virus, which is the cause of the current West African epidemic, and the

bivalent form includes the Sudan strain of the virus as well (see Fig. 1). The monovalent form will be evaluated in a nonrandomized, open-label study involving 60 adult volunteers who will receive the vaccine at three different doses ( $1 \times 10^{10}$  vp,  $2.5 \times 10^{10}$  vp, and  $5 \times 10^{10}$  vp). The bivalent form will be evaluated in a nonrandomized, open-label study involving 20 adult volunteers who will receive the vaccine at two different doses ( $2 \times 10^{10}$  PU and  $2 \times 10^{11}$  PU). Both studies will assess safety, side effects, and immunogenicity, including antibody responses as measured by enzyme-linked immunosorbent assay (ELISA) and neutralization assays and T-cell immune responses as measured by intracellular cytokine staining. Investigators anticipate that preliminary immunogenicity and safety data will be available by November.