Dentistry and Dental Education in the Context of the Evolving Health Care System


Abstract: This article is intended to stimulate dialogue within the intertwined dental practice and dental education communities about our evolving health care system and dentistry’s role within this system as it reconfigures in response to a complex interplay of influences. The changing dental disease burden in the United States is analyzed with consideration of how evolution in disease prevalence influences societal need for dental services and the resulting potential impact on the types of services provided and the education of future dental practitioners. The article concludes with discussion of a potential future scenario for practice and education in which one or both of the two health abnormalities (dental caries and periodontal diseases) most closely associated with dentistry as an area of medical specialization go away as a consequence of transformational technologies.

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This article is one in a series of invited contributions by members of the dental and dental education community that have been commissioned by the ADEA Commission on Change and Innovation in Dental Education (CCI) to address the environment surrounding academic dentistry and affecting the need for, or process of, curricular change. This article was written at the request of the ADEA CCI, but does not necessarily reflect the views of ADEA, the ADEA CCI, or individual members of the ADEA CCI. The perspectives communicated here are those of the author.

Key words: dental care delivery, public health, health care policy, risk assessment, health care costs, evidence-based practice, dental education

As an opening qualifying statement, speculating on an evolving health care system is at best imprecise and may be wildly inaccurate. This article is written to encompass what I view as the most probable developments based on current trends and the projections of a number of health care planners, public policy formulating agencies, and emerging health care markets.

This article specifically does not consider the upcoming 2008 national elections and the potential for a universal single-payer health plan that may or may not encompass dental benefits or how such a system might be implemented. The sequence of this article is to

- examine the changing dental disease burden in the United States and hence the need for dental services;
- provide an overview of the system of dentistry since the system defines the players that may influence dental education;
- identify a number of the influencers on dental care delivery and the education system processes; and
- from these perspectives, opine on the potential impacts these influencers will have on dental education.

First and foremost, this article is meant to stimulate thoughtful discourse about our evolving health care system and dentistry’s role therein. I have no lock on the truth about the future. If this perspective engenders discussion amongst dental educators regarding curriculum, staffing, facilities management, etc., it will have performed its intended purpose.

Dental Diseases and Their Distribution

Severe dental diseases were once pandemic in the U.S. population. As a result, even though the average life span was significantly shorter than today, edentulism was quite high, and suffering dental pain was common. Paintings of the first U.S. president with a scar on his cheek left by a fistula, reportedly of dental origin, are reminders of how far dental science has come in two hundred and thirty years.

As a pandemic, dental diseases affected virtually our entire population. This had impacts on much of our society and our health care concerns as a nation. Congress initially formed the National Institute of Dental Research, now National Institute of Dental and Craniofacial Research (NIDCR), in 1948 partially as a response to the dental condition of young men being conscripted into World War II’s
Dental diseases were ubiquitous and crossed most socioeconomic lines. Today we no longer face this degree of disease penetration. Dentistry’s two primary diseases, dental caries and periodontal diseases, are no longer evenly distributed in the population. Some population segments still have epidemic disease penetration, while other sectors of society have an endemic disease distribution. In many U.S. population segments, dental diseases progress at significantly slower rates than in the past, while, in others, rapid progression is still the norm. This is not to suggest that other disease processes are not found in the orofacial structures. It is not the intent of this article to avoid those diseases and conditions. Rather, it speaks to the impacts of the two primary diseases on the work burden in daily practice and on the teaching of dental skill sets that address these areas. Treating the etiology, prevention, diagnosis, restoration, and management of these two diseases, their clinical sequela, and the cosmetic needs of patients still commands the greatest time and returns the greatest revenue within the general practice of dentistry.

The influence of this changing distribution of dental diseases on the dental health care system is that clinicians need to be not only astute diagnosticians but also must acquire significant skills in risk assessment. That is, they should have the skill sets to be able to predict who in their patient census is at higher risk for acquisition or progression of dental diseases. Unless a practitioner is treating one of the remaining highly diseased U.S. populations, it is no longer acceptable to treat all individuals in a practice as being at equal risk for disease acquisition and progression. At the same time, it is not acceptable to spend time and resources performing risk assessment in a setting where dental diseases are pandemic. A one size fits all strategy overtreats some and significantly undertreats others and may not improve health outcomes, all while consuming scarce resources. Being able to know the differences between pandemic, epidemic, and endemic distributions of diseases in our populations and which population a practice is treating is critically important. It should modulate the diagnostic, preventive, and therapeutic strategies the clinician employs. Health systems recognize this distribution issue and are taking steps to constrain the inappropriate expenditure of resources. This will be an influence on dental practices and delivery systems and hence will impact dental education.

Both of dentistry’s primary diseases are reasonably well characterized chronic biofilm-contained bacterial infections with significant influences from the patient’s immune system and lifestyle. Until relatively recently, dentistry treated these infections by principally using surgical models of care. For dental caries, this surgical model is somewhat cynically described as “drill, fill, and bill.” For periodontal diseases, it was scale, root planing, and surgery. When these mechanisms ran their course, extractions occurred, and fixed or removable prostheses replaced the lost teeth/tooth structure. In most cases, these models of practice represented our “best current evidence.” That we have developed new models, procedures, and practices is normal and expected in a science-based profession; this development is continuously changing health care systems.

These new models emphasize more and more risk assessment and disease management often without surgical interventions. This mirrors the expectations for other health system entities. Science from within and outside our profession is making available new tools for practitioners to better recognize and predict different risk levels in our patient populations. When surgical interventions are required, many new materials and methods are available. “Minimally invasive” is not a term that originated in dentistry. It is a common term and a developing practice in medicine as well. Health systems recognize the myriad of benefits that accrue from less traumatic or atraumatic interventions.

The demographic of the U.S. population is also changing. The U.S. Census Bureau projects almost straight-line population growth with a national negative birthrate. Both immigration and an aging population contribute to this growth, and both bring unique practice issues to health care systems that impact dental education.

For each of these developing areas, the health care system is adapting and evolving. Health care systems examine these emerging demographics, trends, sociopolitical influences, techniques, and technologies with the goal of providing the most efficient and effective diagnostics, preventives, and therapeutics in the populations they serve. Dentistry and dental education will need to align with these shifts.
System of Dentistry and Its Influencers

The system of dentistry includes not only health care providers like dentists and hygienists and dental schools and other entities acting as primary and tertiary treatment facilities, but also consumers (patients), payers (public, private, and patients), medical health care systems, regulatory bodies, political entities (including dental associations), manufacturers of dental products, and more. No player in the system operates independently of the others. The system of dentistry, like other parts of the health care system, represents a complex interplay of interests, influences, and influencers. To cite an example, dental education is influenced by the regulatory agencies that license dental practitioners. The regulatory body is influenced by the political winds and the emerging science of dentistry, as well as by the dental practitioner community. The practitioner community is influenced by the economy and its effect on purchasers’ or patients’ willingness to fund the delivery of dental services and at what level. Changes to payment coverage may be influenced by negotiated labor agreements that are also economically influenced.

This influence chain is highly branched, and this example is not intended to carve out other influences at any level. It is important to recognize that changes to one element of the health care system influence many others and that the entire symphony of players represents the health care system. Influences on the system of dentistry include the following.

Health Care Costs. The influence of total health care costs on the emerging health care system, including dentistry, is substantial. Dentistry accounts for approximately $80 billion per year in a $1.75 trillion U.S. health expenditure economy. The United States is currently spending somewhere near 15 percent of its gross domestic product on health care. This is more than most other first world nations, and the result of this spending is openly criticized and debated. This debate and its consequences are shaping the future health care system. These expenditures are from public sources like Medicaid and Medicare services, from private employer-based payment systems, and from patients themselves (whether as copayments or as self-funding activities). Surveys show that 29 percent of health care consumers skip prescribed or needed health care services because of cost. For 18 percent of Americans, health care costs are the biggest monthly expense they pay after mortgage or rent. These costs influence the emerging health systems and, consequently, dental education. One of the principal influences of interest here is the cost of health care on the pricing of U.S. products in increasingly competitive world markets.

Global Economy. We are part of an emerging and continuously morphing world economy. High health care costs, at their current rates, can contribute to making U.S. products less competitive both domestically and abroad. Demanding a higher price for an equal quality product generally results in lower sales of the higher priced product, which can lead to lower corporate profits or corporate losses. In either a stagnant or a loss position, management of shareholder organizations is then likely to consider a number of cost control measures. One of the options is how it compensates its workers.

Health Care Benefits. In the United States, a major portion of our health care system evolved as an employment-based system. Health care benefits are a form of indirect employment compensation. Historically, this appears to have been at least partially the result of the wage freezes imposed on most sectors of the economy during World War II. In order to attract and retain workers in scarce labor markets in which wages were frozen, employers began using health care benefits as a way to influence workers’ choice of employers.

Consumerism. Today, those employers who are purchasing health care benefits are becoming much more aggressive consumers of health care plans and services in an effort to constrain costs and keep their products competitive. These purchasers are demanding proof of value for their health care expenditures. This is the same demand on their products being requested by their customers. The choices for increasing value are either to lower prices or to increase quality. Whether an employer or a health care system, this generally leads to demand for “effective” practices. “Efficacy” is the ability to produce the desired amount of the desired effect within the system. Within health care, the principal focus of these efforts has been concentrated on medicine. But it is now being extended to dentistry, vision, pharmacy, nursing, and other allied health services. The impact on dental education will be on teaching practices that are effective in specific clinical situations. Dental education is rising to this challenge through its participation in evidence-based practices. This includes the research and publication aspect of dental education as well as the teaching and service components.
Total Health Care Costs. This search for lower total health care expenditures has helped drive the search for cause and effect between dental diseases and systemic diseases or condition and outcomes of dental interventions. Clearly, if you can perform a $70 dental prophylaxis and reduce the number of $80,000 pre-term low birthweight babies while also improving the quality of life of the child and family, you will follow that practice (assuming there are not other harms induced by the interventions). If dental interventions consistently show total health care savings, the evolving health care system will make provisions for these services. The delivery system for effective services is still being determined in health care systems. For example, if it is both health- and cost-effective to provide four periodontal maintenance visits to periodontally affected diabetic patients, health systems may co-locate hygienists in internal medicine or endocrinology clinics to provide these services.

Evidence-Based Health System Demands. There are a number of other manifestations of this consumerism. For example, the brokers and consultants for dental benefits are directing their sophisticated purchasers to demand evidence-based plan designs. They are seeing some successes with these practices in medicine and are beginning to demand similar proofs in dentistry. They are demanding to know what coverage for specific benefits gets them in improved health care outcomes for their employees and for the future costs for health services. The focus and scope of the phrase “evidence-based” used here is different from the American Dental Association’s clinical definition of evidence-based decision making (EBD) that is justifiably focused on the treatment of individual patients. This “evidence” is about what is best for specific covered populations. How are diseases distributed in the population that will be “insured,” and what’s the most effective way to maximize the population’s health while minimizing the costs? As an example, a cogent question is: if the risks for dental diseases are not evenly distributed, then why does everyone systematically get two bite-wing radiographs every year? This diagnostic practice may have made sense in 1950 when cavities and periodontal disease were pandemic, but it does not make sense now in specific populations.

Research and development in this area are ongoing by a number of interested parties including many dental schools. Development is impeded by the lack of commonly agreed on and used diagnostic codes. Such codes have the potential to significantly improve outcomes research and are used throughout the general health care system. To the great credit of the American Dental Education Association (ADEA) and a number of the Association’s constituent schools, there is real effort being expended now to remove this impediment in an open and public process.

Litigation. The U.S. culture of litigation also influences health care consumerism and the emerging health care systems. Hospital systems and health plans have been and are being sued for permitting practices that were knowingly not effective or actually harmful. One way to manage this kind of risk is to develop guidelines or practice parameters. These guidelines or practice parameters are employed to constrain practices that consistently fall outside a reasoned (evidence-based) set of options. In the case of individual practitioners, they may lose their privileges or may be dropped from payment systems if their practice is deemed to be inappropriate, ineffective, or harmful. This is a different form of risk assessment being practiced within the health care system.

Dental education may be indirectly affected by these activities. The key for most practitioners and health systems is the development of critical thinking among the system’s participants. This has been an articulated goal of dental education for many years, but without much tangible emphasis in curriculum competencies (knowledge, skills, and values of dental school graduates) distributed by ADEA or the accreditation process for dental schools implemented by the Commission on Dental Accreditation. Critical thinking has a much more prominent emphasis in the revised version of curriculum competencies that ADEA is in the process of ratifying for distribution to dental schools in 2008. Whether critical thinking will become a greater focus of examining and regulatory bodies remains to be seen. This skill set is crucial for staying current in a health care industry with a rapidly changing science base. The knowledge that students and practitioners acquire today may be obsolete in the not-too-distant future. Transitioning to new practice mechanisms requires the ability to assess and think critically about that science and its sequela.
formance. The Academy of Internal Medicine, in a proactive move, is judiciously examining whether an increasing portion of an internal medicine practitioner’s compensation should be determined based on outcomes of care. This is one of the reactions to practice variation in diagnosis, prevention, and treatment. Our health care literature is replete with examples of trying to control this variation when it reaches the point where patients are being harmed. Recently, health and cost outcomes for overtreatment are beginning to drive this pay for performance equation. Dentistry will not escape this process because it operates in health care markets and the control of variation is an emerging consumer expectation.

Public Disclosure of Outcomes. External entities are also rating providers of care and posting these ratings on websites and other publicly available media. Some of these are subscription systems where, for a fee, you can examine the ratings of a practitioner’s performance, while others are provided as a public service. Some of these ratings services are publicly funded entities. In all of these, performance is judged against a normative standard. Without belaboring the point, risk adjustment of these results is critical to having valid ratings. This too is driven by consumerism. If there were no markets for these ratings, there would be no business. Dental education would seem to have a role in participating in the development of these normative standards.

Transformational Technologies. Finally, the biggest wild card influencer for the dental health system is the unanticipated advent of one or more transformational technologies that directly affect dental practice and hence dental education. Transformational technologies are defined by the buggy-whip scenario. Buggy whips, once in high demand, are now novelty items or functional items for a limited market. The automobile was the transformational technology that delimited the value of the buggy whip and the buggy whip-making service. One such scenario for dental health care is that science develops an inexpensive way to diagnose who is at risk for cavities or discovers a cure for cavities in treated populations. If such a technology is simple and easily used, who will do this? Will it be so simple that it is dispensed over the counter? For those who have been around dental research for many years, this “cure” has been “just around the corner” for years. Looking at our current health research papers at the International Association for Dental Research and American Association for Dental Research, the reality seems closer than it has been before. Health systems will respond to these transformational technologies as they have previously. Vaccines and numerous other preventive technologies are now regularly employed whereas, in previous decades, patients received extensive treatment in the offices of practitioners. Dentistry is particularly vulnerable because we are medical specialists, and if one of the specialty diseases strongly associated with the practice of dentistry is virtually eliminated, the health system will change. This would also be true for a permanent restorative material that meets the aesthetic demands of patients or elimination of recurrent caries. Dental education would be significantly impacted by such a change. The salient questions, as noted above, are 1) when will this occur? 2) what will be the training required for transitional dentists as the diseases traditionally addressed by the dental profession wash out of the system? and 3) what will be the training and nature of practice for follow-on dentists when there is no new disease?

Influences on Dental Education

As general health care and dentistry respond to the issues of the changing distribution of dental disease, other issues and changes that will influence dental education include the advent of new materials and strategies for disease management; risk assessment; the intertwining system of health care and dentistry; the advent of consumerism and all its manifestations; and transformational technologies. They always have.

A real question is: when and how rapidly will these changes effect dental education? And will these changes be generational, or will they be proactively sponsored and happen virtually overnight? Given the rate of change of our science and the evolving health care system’s responses to that system, it would seem to fall somewhere between generational and instantaneous. Watching what is playing out in medicine is useful in planning our future in dentistry. The dental education community will continue to play a major role in these changes. The community, through its research and teaching at both the undergraduate and graduate levels, will be important in systemic transitions of the delivery of effective health care.
REFERENCES