

*Envisioning the Education of an
Oral Health Workforce for the Future*

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Introduction

Health is a critical dimension of human well-being; a requisite for individuals to realize their full potential and to flourish as human beings--a basic human good. Oral health is an integral and critical component of general health and well-being. One is not healthy without oral health. The development and deployment of a well-trained, comprehensive, multi-functional oral health care workforce is an imperative for the oral health of a population.

I am committed to the following assumptions in my remarks today:

1. Oral health is a component of general health and well-being.
2. The stomatognathic system is integrally linked physiologically to all organ systems, and oral disease has an effect on general health.
3. Caring for the stomatognathic system is an essential component of primary health care.
4. There is an increasingly aging population with chronic diseases; and expanding numbers of individuals seeking oral health care who are biologically and/or pharmacologically compromised.
5. Conceptually, the practice of dentistry is the practice of medicine—oral medicine.
6. Societal resources are, and will continue to be significantly constrained, requiring a cost-effective oral health care delivery system.
7. The current workforce is not effective in addressing the oral health needs of our population, specifically our children.

The oral health care workforce, and thus the educational system for educating oral health professionals, must be re-envisioned as a result of these assumptions.

Time does not permit me to offer a comprehensive vision of the required changes, nor a complete justification for all of the changes I think necessary or even the ones I will propose today. Thus, my presentation will be somewhat fragmented as I will only address two of the concepts I believe imperative in our workforce strategies of the future. First, dentists of the future must be educated as physicians of the stomatological complex—oral physicians if you will; and secondly, we must train dental therapists to care for the oral health of our children.

The Oral Physician

My use of the term *oral physician* is meant to emphasize a call for integrating dentistry with medicine and a significant change in the paradigm for educating oral health professionals for the future. If you are troubled by the choice of terms, I invite you to

substitute *dentist* or *dentist-of-the-future*. The argument is that all dentists will need to be *physicians of the oral cavity*, not just a select few.

Dentistry as a profession must acknowledge that a dentist requires the same core understanding of human anatomy, physiology, microbiology, pathology, and pharmacology and other basic biomedical sciences as the typical physician; that the stomatognathic system is not conceptually different from any other organ system, and that dentists must be educated to the same levels of competency in the core of general medicine as other physicians. Dentists must have the ability to manage biologically and/or pharmacologically compromised patients while providing oral health care.

Justification and rationale for the *oral physician* and this educational proposal is supported by environmental pressures that are forcing the transformation of dentistry. They are conceptual, biological, and epidemiological.

Conceptual reflection forces transformation of dentists into *oral physicians*. The oral cavity, the stomatognathic system, is part of the human body. It is not remarkably different than any other functional organ system. There is no reason to believe that the first twenty centimeters of the alimentary canal is or should be treated as being conceptually different than the rest of the human body. While it has unique qualities and characteristics, they are differences of form and function, not substance. Oral health is intimately related to general health and well-being; it is not elective nor discretionary. The oral cavity is a mirror of health, with many systemic diseases being reflected through oral manifestations. Likewise, many oral diseases have systemic effects. The mouth is integrally and intimately linked to the body. Oral health is an essential component of general health, human function, and the quality of life. Dentists should be able to consider and evaluate the general health of their patients in caring for them, as well as participate in the provision of general health care, in ways no different from other specialties of medicine. Dentistry is to medicine as ophthalmology is to medicine. Conceptually, they are equivalent specialties of medicine.

Reflection on biomedical advances forces transformation of dentists into *oral physicians*. Molecular and genetic approaches to diagnosing and treating disease are revolutionizing health care. Geonomics, proteonomics, salivanomics are expanding our options for prevention, diagnosis, and treatment. In order to apply modern science, the contemporary dentist must understand modern science in a way current curricula in dental education generally do not permit. No one has better articulated the need for improving the basic science and clinical medicine education of dentists than the distinguished Tufts graduate, Dr. Bruce Baum, until retirement, clinical director of the NIDCR, and among its leading intramural scientists. The science knowledge base required of a dentist managing the oral health of an individual closely resembles that required by a physician managing the health of any other of the body's organ systems. Both must broadly understand human biology, including biochemical mechanisms, molecular biology, immunobiology, and the core of clinical medicine. While affirming that the dentist as an *oral physician* must be sophisticated in

understanding the biological and clinical sciences of general medicine, it is also necessary affirm that the *oral physician* must be able to continue to provide the same skillful level of complex mechano-technical therapy as in the past.

Epidemiological analyses force transformation of dentists into *oral physicians*.

Millions of individuals who are medically or pharmacologically compromised experience oral health problems. In fact, many individuals are at high risk for oral problems because of systemic disease and disabling conditions. The dentist must be able to manage the oral health care of individuals with diabetes, heart disease, cancer, acquired-immune deficiency syndrome, as well as a myriad of other diseases and processes that require accommodation in oral therapy. The percentage of individuals using pharmacologic agents increases with age, and 90% of individuals over age 60 use prescription drugs, many to control cardio-vascular disease. Many of these drugs affect dental therapy, requiring dentists to have a high level of knowledge in physiology, pharmacology, and pharmaco-dynamics in order to make necessary accommodations. Furthermore, poor oral health can compromise general systemic health. The success health care is experiencing in managing disease and disability and extending life has resulted in large numbers of health-compromised individuals seeking routine oral health care. The *oral physician* must be able to effectively and safely provide care to these individuals.

A World Health Organization report, "*Oral Health for the 21st Century*" stated:

"The changing disease patterns, the advanced diagnostic and treatment methodologies and the broadening of responsibilities illustrate the need for a new type of oral health professional, someone with special education and skills in the care of the oral and maxillofacial complex... [an]'oral physician.'

Educating an Oral Physician

Specific strategies for educating dentists as *oral physicians* will be dependent upon individual schools of dentistry and medicine. It is beyond the scope of my comments today to outline in any detail an *oral physician* curriculum. However, the curriculum must include participation in the same basic core curriculum in which individuals studying to be specialists in other fields of medicine must participate.

In the *oral physician* curriculum initially conceived at the University of Kentucky, student dentists were to participate in the curriculum with student physicians for three years, the two years of the basic biomedical sciences and the third year of the clinical clerkships. The fourth year of the general education of physicians in the United States is largely composed of selectives, non-required courses. In the curriculum conceptualized, the selected fourth year of the curriculum was devoted to dentistry with an added of dentistry. Thus a five year program for the study of dentistry would have evolved, with 3 years of the basic biomedical science and core of clinical medicine of the typical curriculum in medicine, and two devoted exclusively to pre-clinical and clinical dentistry. There is precedent for such a 3+2 approach in medical education as there have been

several family practice and internal medicine residency programs in the past that developed 3+3 curricula. This curriculum concept would provide the dentist with basic training in general medicine as all physicians, yet would also provide an equal number of hours in the perceptual motor skills traditionally expected of a dentist. The resultant—a graduate having the diagnostic acumen of the physician and the technical skills of the dentist—an *oral physician*.

Organizational and Structural Changes Facilitating Creating an Oral Physician

In 1995, America's most prestigious biomedical science policy body, the Institute of Medicine (IOM) of the National Academy of Sciences published a sentinel report entitled Dental Education at the Crossroads: Challenges and Change. The Report indicated that many of the problems facing dental education were (and are) its isolation. The report stated: "*Dental education and dentistry are made vulnerable by their relative isolation from the broader university, from other health professions, and from the restructuring health care delivery and financing that characterizes most of the health care delivery system.*" The Report emphasized the need for "*closer integration*" of dentistry with medicine and stated that an attempt to maintain the status quo in dental education is a "*path toward stagnation and eventual decline.*"

Isolation breeds ignores—ignorance of what is occurring in academics and the larger world. Isolation from medicine breeds ignorance of the clinical advances in medicine applicable to the specialty of dentistry. Conversely, isolation of medicine from dentistry breeds ignorance on medicine's part regarding the important and significant contributions dentistry has made and can continue to make to clinical medicine, the basic biomedical sciences, and the education of physicians generally. Isolation of dentistry from medicine in caring for the health of the public leads to more of what exists, a general discounting of oral health as integral and essential to general health and well-being.

While it may have been justified to maintain dental schools separate from medical education when dentistry was emerging as a profession, during the period of time that society was overwhelmed by the ravages of dental disease, environmental circumstances make such continued separation unwarranted. Dentistry is medicine; and its continued isolation from the mainstream of medical education and health care is not in the interest of the public. It is time for dental education to lead the profession in integrating dentistry with medicine, where it conceptually and functionally belongs.

How is it possible to justify a separate college just for the teeth? Consider the redundancy, confusion, and expense we would face in the education of health professionals if we were to have a separate school for every organ system of the human body. How nonsensical it would be to have a separate school for those who want to treat the diseases of the eye, another for the heart, yet another for the kidneys; and/or one for each of the thirty plus specialties/sub-specialties in medicine that currently exist in the U.S.?

Academic dentistry becoming a department of oral medicine in a school of medicine would immediately signal a commitment to understanding that dentistry is a discipline within medicine, not an appendage to medicine; and that oral health is integral to general health, not discretionary in health care.

A further educational advantage of departmental status in medicine relates to the education of physicians. Dentistry, integrated organizationally with medicine, will permit the more effective teaching of oral health to physician colleagues who will serve within other specialty disciplines of medicine. Dentists have long recoiled at the ignorance and lack of valuing of oral health by physicians. Structural and curriculum integration offer the opportunity to address this problem.

Research and scholarship languishes at many dental colleges in the United States. Collaboration and interdisciplinary work is essential to conduct meaningful research and to gain extramural funding. Structural integration of faculty members of dentistry with faculty members in the biomedical and clinical disciplines of medicine will facilitate advances in dental research. Today, the majority of research funding from the National Institute of Dental and Cranio-facial Research goes to only ten United States dental schools. Significant funding for dental research is awarded to our nation's medical schools. This suggests research is languishing in our dental schools.

Structurally integrating dental education with medical education offers the potential to create greater degrees of administrative efficiency, and to effect financial savings that are mandatory in today's society. This is possible by taking advantage of the substantial administrative infrastructure existent in colleges of medicine in the basic sciences, student affairs, academic affairs, clinical affairs, faculty affairs and research. Significant duplication could be eliminated if academic dentistry did not have to maintain separate administrative support for each of these areas, but rather could participate in the structure supporting medical education. Again, the IOM report stated, "*financial strains...will encourage institutions to consolidate or otherwise link programs in related areas such as medicine and dentistry.*" The Report went on to recommend that dental education experiment with less costly alternatives such as merging courses, departments, programs, and entire colleges. An administrative 'downsizing' of dental education, by moving academic dentistry into schools of medicine as a department of oral medicine would be consistent with the substance and spirit of this recommendation. Significant environmental forces are at work today that indicate that the costs of dental education must be drastically reduced.

Dental Therapists

As is well-known, dental caries is a "silent epidemic" in America's children. Additionally, there are profound and significant disparities in oral health among our children. Children most in need of care are not receiving care. Children, our society's future, and our most vulnerable population, are being neglected. I am not going to rehearse the data that support these statements—they are well-known.

The attitude of dentists in caring for our nation's children most in need of care is not positive. Less than 25% of America's dentists will accept children in their practices whose care is publicly insured by Medicaid or CHIP. That is a generous number, as the percentage of those who participate to any significant degree is closer to 10 percent--one dentist in ten. Thus we have individuals who have vowed as professionals to care for the public's oral health, and have been granted a virtual monopoly by society to practice dentistry, generally unwilling to treat the children who that same society is willing to pay them to treat. In a recent on-line survey, to which 10,000 people responded, 66% said dentists should be required to accept children with public insurance, absent any increase in fees. Interestingly, we now have over 40 million of our nation's 78 million children who are covered by public insurance--the majority. And, they are the children with the overwhelming burden of oral disease.

As the old saw goes, "*if we keep doing what we are doing we will keep getting what we got.*" It is time to change! And, we have a successful model, practiced internationally--a 'best practices' solution to emulate--as we augment our workforce to both prevent oral disease in our children, and to care for them when preventive efforts fail. The model was developed in New Zealand in 1921, and has since spread to 54 countries of the world. It is the model of the *school dental nurse*, who since the 1980s has been referred to as a *dental therapist*.

Typically, dental therapists practice in school dental clinics as public servants, employed by a country's Ministry of Health. Colleagues and I have a report soon to be published in the *American Journal of Public Health* that compares the outcomes of care by dental therapists practicing internationally in school-based programs with the results of care in the United States by dentists in private practice. In the countries reviewed, between 82-98% of their nations' children receive care in a given year, versus 40%-50% of children receiving care in the U.S. The decayed, missing and filled (DMFT) index for the school-based program was lower for all of these countries, versus the United States. Singapore children's DMFT was 0.7 teeth, the lowest in the world, compared with the U.S. at 2.55. In 2009, the United States spent \$100 billion on dental care; \$30 billion was on care for children, yet only approximately 50% of children received any care that year. The Agency for Health Care Research and Quality indicated that the average cost of care that year for a child receiving care was \$677. In the international countries who utilized dental therapists in school-based programs the costs were between US \$99-176/child. Transposing the international costs--if the U.S. were to have had school-based programs staffed by dental therapists, we could have cared for essentially all of our children for between \$3-6 billion, versus the \$30 billion expended for only one-half of them.

Recently, The Netherlands adopted dental therapists as a major dimension of its dental delivery system, and are now matriculating 300 a year in its vocational schools, where they are receiving dual training as dental therapists and dental hygienists. At the same time the number of dentists being educated in Holland has been reduced by 20%. The rationale: in the future, significant aspects of basic preventive and restorative care will be provided by these therapists/hygienists, with dentists performing more complex procedures and treating medically compromised patients. The new Dutch policy reduces

the absolute numbers of dentists to control the costs of dental education, and develops therapists/hygienists to both improve access to care, as well as reduce the costs of care. Incidentally, the Dutch have expanded the dental education from 5 to 6 years, in order to include more clinical medicine in the curriculum--one of the reasons I have advanced for educating an oral physician. The Dutch are developing a rational oral health workforce.

Throughout the world dental therapists are growing in popularity, primarily because of a dental workforce unable to provide access to preventive and rehabilitative care for all citizens, and at a cost that makes dental care accessible and affordable.

Training as a dental therapist has typically been accomplished in two academic years post-secondary school, and continues to be the model in most countries. However, New Zealand, Australia, Great Britain, and now The Netherlands, have recently integrated their dental hygiene and dental therapy programs into a three academic year joint curriculum. This is a model of dental hygiene education for which I have also advocated.

Numerous studies have been accomplished throughout the world evaluating the quality of care dental therapists provide children, including diagnostic, preventive, and restorative care. The results consistently confirm that dental therapists provide an equivalent quality of care as dentists.

Further Reflections

I was asked by the individuals who invited me today to be controversial. Fearing I have not yet been controversial enough, and always wanting to exceed expectations, I will conclude by identifying three environmental circumstances that create concern and must be anticipated and addressed.

1. There a rapid growth in the number of dental schools in the United States. We have added 10 new schools in the United States since 1997, with two more to enroll students this Fall and additional one to do so in 2015. They have relatively small full-time faculties, depend heavily on extramural training by non-university faculty members, and have no commitment to a research mission. As some have suggested, we are returning to the pre-Gies report of 1926 with educational programs of questionable quality and a preceptor orientation to education. A significant number of additional organizations also expressed an interest in establishing a dental school.
2. As a result the proliferation of new schools, as well as a significant expansion of enrollments of existing schools, there is a dramatic increase in the number of graduating dentists entering the workforce. Demographic, epidemiological, and financial data suggest that while the *need* for dental services will continue to exist, the *demand* for care will likely not keep pace with the increasing numbers of dentists. As a result we will experience a "surplus of dentists" with a return of the 'busyness' problem of the late 80s and early 90s. At the recent dental

education meeting in Seattle, I had an opportunity to visit with Dr. Howard Bailit, another distinguished Tuft's graduate, and express my concern to him. Somewhat to my surprise, Dr. Bailit shares this perspective. Unfortunately, it seems to be off of the radar screen of the American Dental Association and many of our leaders in dental education.

3. Higher education is resolving its financial problems by increasing tuition for its students. This is true for dental education as well; however, it is even more problematic given that dental education is the most expensive educational program in the university. This transferring of major costs of dental education to students is resulting in graduates with exorbitant educational debt—in many instances \$200-300,000. With an expanding number of dentists, and stable or decreasing demand, these debts will not easily be retired.

Conclusion

In closing, permit me to introduce you to a distinguished dental educator of the early 20th century, Dr. Alfred Owre. Dr. Owre was dean of dentistry at the University of Minnesota for many years and concluded his academic career as dean of the dental school at Columbia. Dr. Owre was a member of the Carnegie Commission that developed the so-called "Gies Report" on dental education, published in 1926. A strong case can be made that Dr. Owre's intellectual leadership provided much of the substance for the report that resulted in transformative changes in dental education—a report that is revered by dental educators today. While providing much thoughtful scholarship for the report, Dr. Owre ultimately became critical of the document, thinking it much too conservative. He envisioned a future dentistry and dental education in which our profession was integrated with medicine and medical education; where dentists were educated as specialists in oral medicine--oral physicians. Additionally, he envisioned a dental team led by an oral physician that included lesser trained individuals who focused on providing specific technical procedures, specifically for children.

As the old saying goes...*"There is nothing new under the sun."*